

**SOCIOTECHNICAL IMAGINARIES IN CONTEMPORARY
CHINESE SCIENCE FICTION:**

Exploring Narratives of Artificial Intelligence in
The Robot Who Liked to Tell Tall Tales by Fei Dao
and *Goodnight, Melancholy* by Xia Jia

Master's Thesis

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Abstract

How we understand the future impacts the actions we take in the present. Artificial Intelligence (AI) is one of the significant defining technologies of our modern times, and the visions and narratives contribute to greater sociotechnical imaginaries, which in turn influence human attitudes and actions regarding matters such as policy making or business strategies. A field once dominated by the “west” is gaining pace with many emerging technologies coming from China. The Communist Party of China (CPC) has put AI at the center of their current “China Dream,” a vision in which China takes the global stage.

Simultaneously science fiction (SF) literature has become more prominent in China, with names like Liu Cixin taking on the global stage. In my thesis, I examine whether Contemporary Chinese SF is a valuable tool for understanding Chinese visions of the future. After which, I discuss how current narratives of AI are reflected and negotiated in the Chinese SF works *Goodnight, Melancholy* by Xia Jia and *The Robot Who Liked to Tell Tall Tales* by Fei Dao, which have both been translated by Ken Liu.

In my thesis, I identify how Chinese SF may provide an avenue to the broader understanding of the sociotechnical imaginary of AI in China and even offer alternative global narratives of AI to the rest of the world.

Keywords Sociotechnical Imaginaries, China, Science Fiction, Artificial Intelligence, Future Studies, STS (Science, Technology and Society) research

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Tiivistelmä

Kuinka ymmärrämme ja kuvittelemme tulevaisuuden, vaikuttaa toimiin, joita teemme nykyhetkessä. Tekoäly (AI) on yksi nykyaikamme merkittävimmistä sekä määrittelevimmistä teknologioista, ja visiot sekä kertomukset älykkäistä koneista luovat sosioteknisiä kuvitelmia, jotka puolestaan vaikuttavat ihmisten toimiin ja asenteisiin, liittyen muun muassa politiikkaan tai liiketoimintastrategioihin. Ala, jota aikoinaan hallitsi "länsi", on siirtymässä "etelään" monien Kiinasta tulevien, uusien teknologioiden siivittämänä. Kiinan kommunistinen puolue (KKP) on asettanut tekoälyn nykyisen "Kiina-unelmansa" keskiöön. Unelma on visio, jossa Kiina astuu globaalille näyttämölle tekoälyn avulla.

Samaan aikaan tieteiskirjallisuus (SF) on noussut näkyvämmäksi Kiinassa, ja Liu Cixinin kaltaisten kirjailijoiden nimet ovat tunnettuja maailmanlaajuisesti. Opinnäytetyössäni tutkin, onko nykykiinalainen tieteiskirjallisuus arvokas työkalu kiinalaisten tulevaisuudennäkymien tutkimiseen. Lopuksi pyrin selvittämään minkälaisia kertomuksia tekoälystä löytyy kiinan tieteiskirjallisuudessa ja analysoin Xia Jian *Goodnight, Melancholy*-, sekä Fei Daon *The Robot Who Liked to Tell Tall Tales* -novellit.

Opinnäytetyössäni tunnistan, kuinka kiinalainen tieteiskirjallisuus voi tarjota uuden väylän sosioteknisten kuvitelmien laajempaan ymmärtämiseen ja jopa tarjota vaihtoehtoisia globaaleja kertomuksia tekoälystä muulle maailmalle.

Avainsanat Sosiotekninen kuvitelma, Kiina, Tieteiskirjallisuus, Tekoäly, Tulevaisuustutkimus, TTY (Tiede, Teknologia ja Yhteiskunta) tutkimus

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I. Preface

My interest in China grew during my teenage years, as I used to compete in a sport dominated by athletes from China. While I was able to exchange pleasantries with most other global athletes, I could not communicate in English with the athletes from China. The lack of my ability to communicate frustrated me, and so my language learning journey began. What started as an initial goal to learn some keywords grew to become an interest in a whole new culture and history. During my time at university, I took courses on various topics regarding China in different institutions such as Stanford University, Hong Kong University of Science and Technology, University of Zürich, and my home university Aalto University.

Although my major is in Information Service Systems under the School of Business, I believe that forming an understanding of China and its future is essential to almost every field, especially one that is closely linked to technology and information. In a global environment, it is hard to disregard China. However, I often feel that the media portrays the country in a black and white manner and am worried about the enormous gaps forming between what we know as the east and the west. I wish to remain as unbiased as possible, but it is important to note that my background and values are greatly influenced by my European background and field of study.

I wish that in the future, I can work on a similar project in a team that compliments my skill sets and helps me improve the foundation I am laying in my work. I hope you find my thesis thought-provoking, and maybe my it will spark an interest in building common human futures in you too. If it does, drop me a note at [firstname.surname\(at\)gmail.com](mailto:firstname.surname(at)gmail.com).

1. Introduction

“We’ve had science fiction novels where China is dominant; we’ve had novels where India is dominant, and I suppose it’s all about getting away from the cliched old, tired idea that the future belongs to the West”

– Alastair Reynolds (2012)

“China is on the path of rapid modernization and progress, kind of like the U.S. during the golden age of science fiction. The future is full of threats and challenges – a very fertile soil for speculative fiction.”

– Liu Cixin (2014)

1.1. Background and Motivation

In Han Song's science fiction novel *Red Star Over America* (2000), the year 2066 marks a turning point in Sino-American relations. The American empire has suffered a series of economic and political disasters and is now caught in a second civil war. China, on the other hand, has achieved superpower status, unlike any other country. This status has been achieved by succumbing to "Amando" (阿曼多), an Artificial Intelligence (AI) with the ability to predetermine everyone's life and see to everyone's happiness as best as it can. However, even Amando is of no use once a group of extraterrestrials descends on Earth, claiming China to be the Land of Promise (fudi 福地, which, en passant, is a euphemism for a cemetery), (Li and Zhang, 2016). In *Red Star Over America*, Song evokes his audience to reassess the geopolitics of utopia regarding the conflict between nationalism and globalism as well as socialism and capitalism (Wang et al., 2020). While Song might not provide definitive answers on how

humanity should proceed, his science fiction novel is a flashback set in 2126, where all the civilization on Earth, whether capitalist or socialist, nationalist or globalist, has been eradicated. His novel calls for a shared conversation on humanity's future (Ibid.).

Although the China of today does not have complete authority over the entire human race, it is hard to hold any purposeful discussion on the future of humanity – whether on Artificial Intelligence (AI) ethics, globalization, or climate change – without including it in the conversation (Heberer, 2007). This thesis engages with China, a civilization with a history longer than 5000 years, to produce cultural insights into the sociotechnical imaginary of AI in Chinese society and to lead a discussion on the implications of these imaginaries.

China is one of the biggest economic success stories in human history (Ray, 2002; Naughton and Tsai, 2015), and it has managed to become the world's second-largest economy after the United States (International Monetary Fund 2020; Huang *et al.*, 2021). According to a 2020 report, due to the COVID-19 pandemic, it is estimated that China will overtake the US economy by 2028 (BBC, 2020). This estimation is five years prior to previous estimates (Huang *et al.*, 2021). For consecutive years now, China has been the world's leading exporter and second-largest importer of goods (World Bank, 2020), and during the last decade, the country has increased its foreign aid provision and outward foreign direct investment (FDI) aggressively (Dreher *et al.*, 2018; Wang and Zhao, 2017). Not only has China made a significant economic rise, but it has displayed decisive geopolitical action (Lia, 2018), reflecting China's heightening capabilities in both hard power and soft power (Robertson and Sin, 2017).

After the rise of the Communist Party of China (officially CPC, 中国共产党, but more commonly known as CCP, the Chinese Communist Party) science and technology rose to the forefront as the key to national rejuvenation (Hughes, 2006; Yang, 1990). A review by Yang (1990) of the governmental policies on the development of technology in China displayed how the leadership portrayed technology as crucial if the country were to compare with other industrially advanced countries. For example, in the 1980s, the propaganda apparatus of China started a full-steam campaign to promote the famous theory of Deng Xiaoping that "science and technology constitute a primary productive force" (Ibid.). Phrases like "enhancing trade by relying on science and technology" (Fan and Watanabe, 2006, p. 307), "rejuvenating China by technology and education" (Na, 2003), and, more currently, the eager plan "Made in China 2025," through which China is to become a self-reliant technology power absent of foreign technology (Wübbecke et al., 2016), are all part of a governmentally constructed, dominant discourse projected to the population through institutions and the mass media (Liu and Zhao, 2021). Liu and Zhao (2021) capsule that "the discourses encompass a sociotechnical imaginary of technology as a means and promise of rejuvenating the country."

One of the most significant technological achievements of China has been the leveraging of Artificial Intelligence (AI) (McBride and Chatzky, 2019), and the country has put AI as a central strategic focus^{1,2} (AIDP, 2017). The country, which once lagged decades behind the technologically and scientifically advanced United States of America, has now caught up. A turning point, or the "Sputnik moment," as two Chinese government insiders called it (Lee, 2018), for AI development in China in March 2016, AlphaGo, a machine built by Google

1. See Roberts et al. (2019) for a complete analysis and discussion on the directions and implications of the AIDP (Artificial Intelligence Development Plan),

2. For more information on the Chinese perspective on ongoing efforts to develop theories of AI governance and technologies, see Wu, Huang and Gong (2020).

DeepMind engineers, defeated Lee Sedol, a South Korean professional player, four to one (Borewicz, 2016). China had caught on to an "AI fever" ². Given the country's relevance in the global economic, political, and technological landscape, what happens in China will be of global relevance (Huang *et al.*, 2021).

What started as enthusiasm in the business and technology communities has spilled over into government policymaking. In 2017 the Chinese government deployed a grand AI development initiative, the 'New Generation Artificial Intelligence Development Plan' (新一代人工智能发展规划)¹ – a strategy outlining how China will become a leader in the field by 2030 (O'Meara, 2019, Roberts *et al.*, 2021), with possibly tens of billions of dollars reserved for the development of AI ("China AI Development Report," 2018). Funding is pouring into AI research and start-ups from a multitude of venture capitalists and tech juggernauts. The country is home to many of the fastest start-ups to reach a \$1 billion valuation globally (Dychtwald, 2021). This, in turn, has attracted some of China's brightest minds into the field, with universities opening AI Institutes and Machine Learning degrees becoming increasingly popular among Chinese youth (Knight, 2019). According to a Stanford University report, China overtook the United States of America in Academic AI paper citations, with a citation rate of 20.7% (Zhang *et al.*, 2021).

This broad-based support and focus on the field have reflected and fed into China's growing strength as a shaper of the future, but it is only one part of the equation. What truly makes China's global rise in AI technology is that it has a resource at its disposal that few other countries have: massive amounts of data on a gigantic population and a history of weak data protection regulation (Chai, 2018; Morris, 2019; Sonnad, 2017). As Robin Li stated in 2018, "the Chinese people are more open and less sensitive about privacy issues. If they can trade

privacy for convenience, safety, and efficiency, in many cases, they are willing to do that" (Liang, 2018). Furthermore, the people of China have lived through rapid and constant change, therefore developing an astonishing capacity for adopting and adapting innovation at unmatched speed and scale (Naughton and Tsai, 2015). This innovation ecosystem – China's hundreds of millions of hyper-adoptive and hyper-adaptive consumers – earns China the candidacy as the next – if not current – 'AI superpower' (Annag, 2012; Cao and Paltiel, 2015; Fish, 2017).

There seems to be little expert consensus on China's future, such as its economic growth and GDP, the size of its military and intelligence budget, as well as political and technological endeavors (McKinsey Global Institute, 2019; Mitter and Johnson, 2021). Ambiguity in estimates is expected as China is enormous, fast-changing, complex, and thus not easy to understand. But it seems that particularly the 'western'³ world is having trouble deciphering and understanding the diplomatic discourse of this 'eastern'³ power, not knowing what the nation means by the "common future of mankind" (Semenov and Tsvyk, 2019). International cooperation with China, including on topics such as AI, has been difficult, especially for the European Union, Australia, and Anglo-America (Roland, 2021; Mitter and Johnson, 2021).

To achieve actual global benefits of artificial intelligence (AI), better international cooperation in governance and ethical guidelines is required (ÓhÉigearthaigh et al., 2020). Nevertheless, it is essential to allow for divergent cultural priorities and perspectives (Ibid.). Barriers to

3. As is noted by Ess (2015), the terms 'western' and 'eastern' are troublesome. Instead of representing diverse nations and cultures, they are much more a product of history and colonialization. Nevertheless, these terms continue to be widely used in research as shorthand for more significant cultural differences relevant to my thesis. I will continue to use these terms in my research for clarity while being aware of their limitations and the need for better language centered around the issue.

achieving cooperation and commitment are plentiful. ÓhÉigartaigh *et al.* (2020) have identified mistrust between different regions and cultures as the most significant barrier to international cooperation in AI governance and ethics. Of particular interest is the barrier to cooperation between The United States of America and China, also known as the 'AI Superpowers'.⁴ Both regions have a vital role in the current development of AI governance and ethics (Benaich and Hoghart, 2019; Haynes and Gbedemah, 2019; Perrault *et al.*, 2019). Lee (2021) argues that "the United States and China are leading the AI revolution, with the United States leading research advances and China more swiftly tapping big data to introduce the application to its large population." Recently the culture of mistrust between these two regions has grown stronger (Lieberthal and Jisi, 2012).

ÓhÉigartaigh *et al.* (2020) suggest that this mistrust is due to both (1) a history of political tensions between these two powerful regions, which is contributing to the competitive framing of AI development as a 'race' between 'eastern' and 'western' nations, and (2) the different philosophical traditions upon which these regions are founded, which is leading to a perception of significant and irresolvable value differences between 'western' and 'eastern' nations on critical issues such as data privacy (Larson, 2018; Horowitz *et al.*, 2018; Houser, 2018). ÓhÉigartaigh *et al.* (2020) argue that misunderstanding could play a significant role in fueling mistrust. It is not uncommon for societal and political differences in these regions to be overemphasized and misunderstood. Simultaneously it would be naïve to believe that every

4. According to Hart and Jones (2010), there is no commonly accepted definition of rising power, nor are there any internationally recognized sets of traits that would make a nation one. All rising powers exist under divergent conditions, making determining a specific definition strenuous. Although a specified definition does not exist, Hart and Jones (2010) introduce several traits that rising powers often exhibit. These include emerging economic power, desire for an influential role in international affairs, internal solidarity, as well as expanding political and military resources. In addition, a rising power should be able to interact internationally with other strong states. Thus, in my thesis, when referring to a superpower, I will use Miller's (2006) definition that a superpower is a nation that can dominate and influence more than one region of the world at a particular time through the attainment of hegemony.

important ethical principle in AI can be shared. However, efforts to achieve greater understanding between these 'AI superpower' nations are not in vain. There is immense value in shared progress and thus a need for mutual understanding across natural borders (Lee and Qiufan, 2021).

1.2. Research Imperative

Lately, AI and the Future of China has been an up-and-coming field in research, with publications on China-related topics growing (Fravel et al., 2021). There is a desire to understand China better, and current research has attempted to build an understanding of AI in China from several perspectives (Callahan, 2005). Myriads of papers have attempted to accurately translate and analyze Chinese documents regarding AI (Allen, 2019). Some researchers, in turn, have attempted to assess the plausibility of China's AI strategy in light of China's current technical capabilities (Ding, 2018; "China AI Development Report," 2018). Others have sought to comprehend specific developmental areas, such as security or economic growth (Barton et al., 2017; "Net Impact of AI on jobs in China" 2018; Allen, 2019), as well as developments in research (O'Meara, 2019). According to McKinsey Global Institute (2017), achieving a consensus" will require a liability of autonomous vehicles." Many researchers (Barton et al., 2017; Ding, 2018) agree and see these areas to be of particular importance for AI's adoption and further development.

Much of this discourse on AI, especially related to China, is centered around efficiency, optimization, and profit maximization as well as social control and security instead of human flourishing (Jasanoff and Kim, 2009). Of course, none of these traits in a vacuum, and social control, optimization of processes, and profit maximization can contribute to human

flourishing, but little light has been shown on how citizens and individuals are reacting to, and thinking about, our AI future (Ibid.). When current research in economics, politics, and technology discusses China, the term China or Chinese is repeatedly associated with the Chinese government and its policies leaving out its people from the discussion. Of course, some research has shown that Chinese people tend to be more optimistic about the impact of AI on, for example, jobs. For instance, the Pew Survey (Wike and Stokes, 2016) showed that Chinese believe that the country's power is rising, corruption is cleaning up and quality of life will improve, mostly thanks to technological leaps. The same survey indicates that there are also worries about consumer safety and pollution due to technological leaps. However, we still lack an understanding of the social, cultural, and historical context behind these views and how these views might shape the future.

Understanding the human element is essential because, at the core AI is, more than anything else, about the future of humanity, and there is a growing field that has begun to understand how AI will transform through human perception and how the public – not just researchers and specialists comprehend it (Frank *et al.*, 2021; Nader *et al.*, 2022). Outside the field of technology and economics, there is plenty of research in the humanities and arts to try to understand China. For example, research by Professor Daria Berg from the University of St. Gallen "is trying to create a roadmap to enhance our understanding of China's culture in the past and in the present" (Berg and Strafella, 2016). I believe that research of this nature is much needed in the conversation surrounding AI in China.

In answering questions regarding China, AI, and our human future, I call for multidisciplinary knowledge from both the field of technology and sciences as well as the field of social sciences and humanities. One such promising field of study in the intersection of Science, Technology,

and Society (STS) is the study of sociotechnical imaginaries. Sociotechnical imaginaries are "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of advances in science and technology" (Jasanoff, 2015). In other words, sociotechnical imaginaries are collective imaginations of the future produced out of the field of science and technology. Developed in the Program on Science and technology studies at the Harvard Kennedy School, "the theoretical concept of sociotechnical imaginaries is the first in a series of research tools explicating key STS concepts."

These "sociotechnical imaginaries" are of particular use for policymakers trying to communicate visions of futures that are desirable and attainable. Imagined futures help provide just reasons for new investments in science and technology. Advances made in science and technology, in turn, reaffirm the capacity of the state to take the role of the responsible steward of public good (Harvard STS Research Platform). Harvard STS Research Platform sums up that "sociotechnical imaginaries serve in this respect both as ends of policy and as instruments of legitimation." The power of a sociotechnical imaginary lies in that it "allows us to analyze the complex interplay of scientific and technological developments with other dimensions of social life." By calling attention to how visions of future developments in science and technology are almost unavoidable and invoke broader visions of benefits and risks, collective good, and social futures, sociotechnical imaginaries become instruments of co-production (Ibid.). "Imaginaries help explain why, out of the universe of possibilities, some envisionings of scientific and social order tend to win support over others—in other words, why some orderings are co-produced at the expense of others" (Ibid.).

One plausible origin for sociotechnical imaginaries could be found in science fiction (SF). As Qiufan (2021) puts it, "science fiction plays a rather delicate role in investigating the human machine paradigm," but it has undoubtedly shaped how we view AI today. For example, the 19th-century novel *Frankenstein*, which is often hailed as the first modern piece of science fiction literature, raised questions that are still timely. Questions such as whether humans are entitled to create intelligent life that differs from all other currently existing life and what the relationship to this creation should be are still at the center of discussions on AI ethics (EPRS, 2020). In *Frankenstein*, Shelly managed to construct an archetype of the mad scientist inflicting his creations, which still exists in our minds two hundred years later.

The power of popular media in shaping our views is so strong that some have even blamed science fiction for the negative and narrow views individuals and societies have of AI (EPRS, 2020). Others do not share this view and believe that SF, at its best, can serve as a warning and spark thought (Lee and Qiufan, 2021). Qiufan (2021) argues that "speculative storytelling also has a unique ability to transcend time and space limitations, connect technology and humanities, blur the boundaries between fiction and non-fiction, and spark empathy and deep thinking within its reader." Historian Yuval Noah Harari (2019) has stated that "today science fiction is the most important artistic genre. It shapes the understanding of the public on things like artificial intelligence and biotechnology, which are likely to change our lives and society more than anything else in the coming decades."

Although trying to understand the future of AI through science fiction might seem like a novel idea, but I am by no means the first to suggest doing so. Other researchers have also wondered what strictly science fiction can tell us about the future of artificial intelligence (Noessel, 2019; Hudson, 2021), and I will dive deeper into the findings in my literature review in chapter two,

where I will further evaluate and discuss science fiction as a tool to understanding how we perceive AI and our future.

While there is much promise in this research area, researchers also suggest that SF may not always offer the most accurate predictions of what will happen in the future (Noessel, 2019; Hudson, 2021). Nevertheless, Mannermaa (1991) states that imagined scenarios offer a lens into the way individuals and groups currently think of our future and this outlook, in turn, shapes the decisions made today. In addition, Bell *et al.* (2013) argue that science fiction has the potential to become applied fiction. This is due to authors being social commentators and critical observers of the past and present. As Qiufan (2019) puts it, "Science fiction is, by all means, a genre that reflects man's changing relationship to science and technology. It orients itself towards the future and the unknown. However, it also is a form of literature, giving insight to people's mentality and by engaging with various aesthetic forms, science fiction is inseparable from society". One of the most significant worries of humans is also losing their autonomy to machines (EPRS, 2020). Furthermore, science fiction can give people back a sense of control because when people see imagined futures, they have more ability to "step in and make change" as well as "actively play a role in shaping our reality" (Qiufan, 2021). In chapter two, I will elaborate on this thought in the literature review.

One reason I also choose to explore Chinese views on AI Moreover, our future through the lens of SF is due to the nature of this genre in China. I see three clear benefits of using SF; (1) Although there is a clear presence of censorship on other forms of literature and expression in China, "science fiction has emerged as a realm of introspection and discussion of China's past, present, and future" (Sonal, 2019). (2) Chinese SF has gained international attention and readers outside of Asia popular. Especially works of Liu Cixin have gained massive momentum

in the United States (Junker, 2019; Liu, 2016). I view this as an easy entry point and interesting zone to develop a further dialogue about a shared future. Furthermore, (3) Chinese SF is readily available and translated with more thought and nuances than other forms of documents and writing, making it easier to gain access to and understand as a non-native Chinese speaker (Liu, 2016). In chapter two of this thesis, I will also attempt to deepen the readers' understanding of Chinese SF.

1.3. Research objective

It is easy to lose the sense of agency with the world changing so quickly around us. With climate change, the global pandemic, and the rise of technology, there has been an overwhelming sense of human helplessness and depression (Hidaka, 2012). This helplessness has been induced by doomsayers who believe that Artificial Intelligence will end humanity. I do not believe this, and I believe that negative views could effortlessly turn into self-fulfilling prophecies, and humanity could end up in a degenerated reality, like the one in Hao Jingfang's *Folding Beijing*. Thus, I stand with specialists and researchers (e.g., Lee, 2018) who urge us not to be passive spectators but to exercise our free will by making our own choices and taking our own actions. As stated by Sartori and Bocca (2022), "from design to use, there is a path to balance a Human-in-Control (HIC) approach with an ecosystem organized around diversity (in data collection and algorithms models) and intersectionality (in the society)."

The current values nurture our visions of an AI future, and we need to begin exploring these values globally and decide which values are worth holding on to. For example, Sartori and Theodorou (2022) emphasize the necessity for proper sociology for AI to develop a sociological perspective within the AI community. I want to participate in this discourse, and

I believe that in these unprecedented times, we need unprecedented means of understanding our technologies and our relationship to them. Most of all, we need new methods to understand how we think globally and how we can begin to reshape humanity's common future in an attempt to create a better and more inclusive world where individuals and societies can truly flourish.

My research will explore Science Fiction as a viable way to attempt to provide greater understanding between the rest of the world, and especially the 'west' and China, on issues relating to AI so that we can move forwards as one to create something beautiful. I hope this work adds to the academic literature aiming to improve global cooperation and co-creation through building a better understanding. Through investigating how China and its citizens view the future of AI, their relationship to technology, and their dreams as well as fears surrounding the topic, I hope to arrive at themes and visions that resonate with or inspire not only the people of China but the whole global audience.

My first objective will be to assess whether Chinese Science Fiction is a suitable means for understanding AI imaginaries. My second objective is to explore AI Narratives in this literary genre through Fei Dao's *The Robot Who Liked to Tell Tall Tales* and Xia Jia's *Goodnight, Melancholy* – both of which have been translated by Ken Liu. More specifically, I seek to identify and contemplate themes and future images of Artificial Intelligence arising from and amplified by these works of literature. These objectives mold into the following research questions that I will attempt to answer in my thesis:

1. *Can Science Fiction be a valuable tool to understand Current sociotechnical imaginaries of Artificial Intelligence in China?*

2. *What are some AI narratives found in The Robot Who Liked to Tell Tall Tales by Fei Dao and Goodnight, Melancholy by Xia Jia?*

1.4. Structure of the study

This thesis is comprised of six chapters and is structured as follows. To begin, I will map out the current state of research on Science Fiction and its effect on how we view the future of AI. Through my literature review in this chapter, I will address my first research question, "*Can Science Fiction be a valuable tool to understand Current sociotechnical imaginaries of Artificial Intelligence in China?*". After this, in the third chapter, I will present the methodology of my research. The fourth chapter is dedicated to presenting research findings and addressing my second research question, "*What are some AI narratives found in The Robot Who Liked to Tell Tall Tales by Fei Dao and Goodnight, Melancholy by Xia Jia?*".

Finally, the fifth chapter will discuss this study's theoretical and practical contributions, evaluate its limitations, and provide recommendations for further research. In the sixth chapter, I will bring my thesis to a conclusion.

In the next chapter, I will attempt to understand if Science Fiction is a valuable tool in understanding what possible futures are being imagined in China. First, I will begin by reviewing the literature on sociotechnical imaginaries and exploring why it matters how we imagine our future. To do this, I will further explore concepts such as "sociotechnical imaginaries" (Jasanoff, 2015) and "narratives" (Cave et al., 2020). I will give examples of current imaginaries in the west and China. Second, I will discuss the role that SF has played

and plays in creating sociotechnical imaginaries and shaping our views of AI. Finally, I will turn to explore Sinophone Science Fiction as a possible source for imaginaries.

2. Literature Review

2.1. Sociotechnical Imaginaries

“The imaginary is the unceasing and essentially undetermined (social-historical and physical) creation of figures/forms/images, on the basis of which there can ever be a question of ‘something.’—of ‘reality’ or ‘rationality. What we call ‘reality’ and ‘rationality’ are its works.”

– Cornelius Castoriadis (1997)

“With every future we wish to create, we must first learn to imagine it”

– Chen Qiufan (2021)

“The Republic of Science is a Society of Explorers. Such a society strives towards an unknown future, which it believes to be accessible and worth achieving. In the case of scientists, the explorers strive towards a hidden reality, for the sake of intellectual satisfaction. And as they satisfy themselves, they enlighten all men and are thus helping society to fulfill its obligation towards intellectual self-improvement.”

– Michael Polanyi (1962)

The following section will discuss current academic literature on sociotechnical imaginaries. I will begin by exploring what imaginaries are, how imaginaries are created and sustained, their significance in shaping the present, and how we can gain knowledge about them. Moreover, I will end this chapter by exploring examples of current imaginaries in the 'Chinese sphere of influence.'

2.1.1. What are Imaginaries?

Social sciences and humanities have long studied narratives of the future and their relation to the present (Mager and Katzenbach, 2020). In the 20th century, social theorists and philosophers began exploring imagined social collectives. Although the term "imaginary" was often not used explicitly, these works are valuable precedent to research on sociotechnical imaginaries (Harvard STS Research Platform). The concept of an imaginary can be traced back to philosopher Sartre and his book "*The imaginary: A Phenomenological Psychology of the Imagination*" (1940), where the natural human consciousness and imagination are explored. Later other thinkers and researchers expanded on Sartre's ideas, mainly in the subjects of philosophy and sociology.

In his widely influential work *Imagined Communities* (1983), Anderson offers an innovative approach to understanding the emergence of the nation-state and the nature of nationalism. In his work, he argues that the collective imagination of people, who perceive themselves as a cohesive group, produces a nation. Imagined communities are formed through technologies such as the print media that give people who might never have interacted with each other a sense of adjacency and collective identity (Anderson, 1983). Partly building on the works of Andersson, Taylor (2003) concludes that "the social imaginary is 'that common understanding

which makes possible common practices and a widely shared sense of legitimacy." In Taylor's work, he explores the durability of social structures of western modernity through imagination. More extensive forms of imagination shared by ordinary people through images, stories, and legends, sustain the economy, the public sphere, and the people's sovereignty.

Appadurai (1990) suggests a new relationship between imagination and subjectivities characterizes modern society. Appadurai argues that electronic media and mass migration are "interconnected diacritics," which drive the work of imagination, which has become an "organized field of social practice" and a "form of negotiation between sites of agency and globally defined fields of possibility." Therefore, Appadurai states that because forms of life are born more out of our collectively subjective imagined possibilities than specified paths of social practices, imaginaries play a fundamental role in social life.

Hecht (1998) also displays the power of imaginaries as he examined how the French state became interwoven with nuclear technology after World War II. After the German Occupation, French nationalism re-imagined "technological prowess" in itself. There was nothing uniquely French about the technology arising from the era, but through actors casting and narrating the gas-graphite reactor as Gallic, a discourse of technical excellence, a concrete technological system, and national identity were born. According to Castoriadis (1975), an imaginary is a cultural ethos evolved through the social construction of mythologies around social orders. These mythologies produce significations that fortify social relations and organize human behavior. Castoriadis (1975) adds that imaginaries are essentially social, thus transcending the individual subjectivity.

Also, outside of the field of philosophy and sociology, imaginaries have been explored. Science and Technology scholars often refer to collective imaginaries as "technoscientific" – instead of sociotechnical. Technoscientific imaginaries are talked about by several researchers (Polanyi, 1962; Keller, 1985; Latour, 1990; Marcus, 1995; Fortun and Fortun, 2005) who explore tacit and explicit postulations of the epistemic and moral importance of science and what makes it worth pursuing. A study by Fortun and Fortun (2005) on American toxicologists investigated how scientists think about and pursue 'civic science,' a science with an ethical commitment to human welfare. "'Civic science' is something that scientists think about and pursue through practical projects. In anthropological terms, it is the product of an 'imaginary,' in which different modes and products of sense-making come together" (Ibid.).

Scholars must do significant boundary work within the same and from different fields to distinguish and define the theoretical concept of imaginaries (Harvard STS Research Platform). Although not all researchers use the exact definition for an imaginary, it is commonly agreed upon that imaginaries should not be mixed up with *policy agendas* (Kingdon, 1985) and *problem frames* (Schon *et al.*, 1995). Imaginaries are not as goal-oriented, explicit, issue-specific, and politically accountable. Whereas *policies* refer to implicit and legal *plans* of action, imaginaries are more about the underlying rationales and justifications (Harvard STS Research Platform). *Plans*, in general, are usually produced by institutional authorities and have designated goals in the near-term future (e.g., a plan to build high rises in the city center). Sociotechnical imaginaries also differ from *public reason*, shaped through the institutionalized connection between political authorities and citizens, while sociotechnical imaginaries can be expressed and advocated for from a bottom-up, grass-root level (Ibid.).

In addition, imaginaries should not be confused with *master narratives* (Lyotard, 1984), which, while close to sociotechnical imaginaries, are more intimately related to the re-narration of history, more unchangeable and monolithic, as well as less futuristic and goal-oriented. Also distinguished from *media packages* (Gamson and Modigliani, 1989), sociotechnical imaginaries are not solely defined by *discourse*, which focuses more on language while lacking the normative dimensions of sociotechnical imaginaries. Imaginaries are also not an *ideology*. Ideologies are more static, more attune to power structures, and often do not encompass material constructs (Harvard STS Research Platform).

To better understand the reasonably new theoretical concept of sociotechnical imaginaries, it might also be helpful to explore how it interacts with other concepts. "Sociotechnical imaginaries," as a concept, does not exist on its own and has both a connection and genealogy with other science and technology concepts (Harvard STS Research Platform). One such concept with a close linkage to the sociotechnical imaginary is *co-production* (Jasanoff, 2004). Imaginaries aid us in explaining how and why specific images of scientific and social order become dominant instead of the myriad alternative possibilities – in other words, how and why particular visions are co-produced, and others are not (Harvard STS Research Platform).

Grounded in this knowledge, in the scope of my thesis, I will use Jasanoff's (2015) definition of a sociotechnical imaginary and define them as "collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of advances in science and technology."

2.1.2. How imaginaries are conceived and how they shape the present

Contained in the concept of sociotechnical imaginaries is the assumption that certain institutions and authorities have more influence and capabilities to cast their imaginations and have others recognize and engage in them, either voluntarily through, for example, consumer behavior or involuntarily through discipline and governmentality as often displayed in the endeavors of states and statelike actors (Harvard STS Research Platform). Research at the intersection of science and technology, economics, and political science studies examines how such dominant imaginaries are fabricated and how they come to and remain in power.

There is no specific unit of analysis of an imaginary. However, national governments play a significant role in fabricating and realizing sociotechnical imaginaries, and this is especially the case in China, where the government plays a critical role in shaping imaginaries (Huang and Westman, 2021). Though of late, many powerful institutions have also begun to function with their imaginaries of where the world ought to be headed. Around the globe, foundations, such as the *Rockefeller* and *Gates* foundations, technology companies, such as *IBM*, *Apple*, *Tencent*, and *Alibaba*, environmental NGOs such as *Greenpeace*, and expert bodies within, for example, fields of *engineering*, *law*, and *medicine*, influence the public understanding of science (Harvard STS Research Platform). According to Mager and Katzenbach (2020), it is essential to note that sociotechnical imaginaries "are multiple, contested and commodified rather than monolithic, linear visions of future trajectories enacted by state actors" and that "imaginaries are increasingly dominated by technology companies who not only take over the imaginative power of shaping future society but also partly absorb public institutions' ability to govern these very futures with their rhetoric, technologies, and business models."

Nevertheless, in addition to institutional imaginaries, alternative imaginaries are also enacted in the world, often bound by divergent understandings of 'the good life' (Harvard STS Research Platform). Often the imagination projected by the policy world interacts with the public hopes and fears concerning science and technology resulting in their imaginaries. According to the Harvard Kennedy School research platform on sociotechnical imaginaries (2022), "Publics also construct and act upon their imaginaries of those in power and hold policymakers responsible per their tacit or explicit notions of discovery, innovation, efficiency, progress, uncertainty, evidence, argument, value, legitimation." Sociotechnical imaginaries are closely tied to how the public understands science and technology.

"Public understanding of science" is ominous of public backing for science and technology, especially state approval and funding for science (Irwin and Wynne, 1996). Wynne (1995) explains that empirical social science scholars first studied the notion of "public understanding of science" in the early 1970s. At first, these efforts only attempted to assess the public's attitudes towards science and technology, but later the focus increasingly turned to the public's comprehension of scientific methods and specific scientific knowledge. The research on "the public understanding of science" was, in many ways, an effort to assess the credibility of sociotechnical imaginary, which gave science such a crucial role in the undertakings of the democratic state (Harvard STS Research Platform).

Works such as those of Irwin and Wynne (1995, 1996), and the themes they represent, shine a light on the extent to which the imagination of science is also the imagination of the citizens needed to uphold such a system and establishment. Irwin and Wynne (1996) highlight just how insufficient the public understanding of science is and how this feeds into the incessant anxiety about the frailty of the social contract with science. They call for a need to reform the polity

for the public to understand better, appreciate and commit to science and technology as key to the public well-being. In 2007, Wynne et al. constructed a report for the European Commission to show how "EU policy frameworks incorporate tacit, unacknowledged imaginations of risk, ethics, and publics".

Imaginarities are, by nature, products of the collective imagination (Grunwald, 2019). Individuals may envision and convey compelling visions of the future (Collins et al., 2003), but they are not imaginaries unless or until they are planted in the minds of others and people, collectively, begin to produce what has been imagined into existence (Jasanoff, 2009). However, the power of the individual should not be undermined as, according to the Harvard Kennedy School research platform (2022), individuals who "lead and shape institutions or social movements may be especially effective creators of sociotechnical imaginaries." Individuals are often behind imaginations of resistance. Works such as *The Communist Manifesto* (Marx and Engels, 1848), *Silent Spring* (Carson, 1962), and *The Art of Not Being Governed* (Scott, 2009) depart from dominant imaginaries and produce alternative forms of politics. Heterodox views of power are imagined and performed, leading to social movements which challenge status quo sociotechnical imaginaries.

The traditional view of planning is that ideas on how to shape the future are developed and that the future is shaped through the implementation of these ideas (Camhis, 1979). This philosophy also applies to more modern approaches, such as reflexive governance (Voss et al., 2006). As explained in the previous chapter, the world of science and technology is also filled with narratives and pictures as to why and how science and technology should be developed to shape our future. We look towards imaginaries in science and technology to, e.g., solve the global

energy supply problem, enhance human performance, and design artificial life (Grunwald, 2019). Still, the question remains; what does it mean to shape the future?

As Grunwald (2019) explains, "at any time we can only intervene into the present, by communication, by action, or by decisions to be made." Future developments and occurrences are, thus, consequences of these interventions made in the present. Grunwald argues that we cannot directly "shape the future," but intervention into present intentions is possible. Through interventions into the present, we can hope to change the paths our futures might take and expect these futures to align and resonate with the goals of the corresponding intervention. Interventions are made possible by developing sociotechnical imaginaries, which can be used as an orientation to identify needed interventions in the present.

As such, we can see this as futures contributing to shaping the present (Grunwald, 2019). In other words, we create futures in the present that create a new present. This perspective can be traced back to Augustine of Hippo (397): "Thus it is not properly said that there are three times, past, present, and future. It might be said rightly that there are three times: a time present of things past; a time present of things present; and a time present of things future". The past and future are always integrated into the present. According to Luhmann (1998,1992), it is impossible to shape the future in the sense of shaping a future present. For example, we cannot shape some elements of future AI systems for the year 2050. If we are shaping AI systems, we are shaping them now for the present. If we stand by this argument shaping the future is only shaping the present, but in regards to a future we have thought out and believe in – an imaginary.

It can be argued that even forecasters and techno-visionary writers cannot escape the present either because they always have to predict based on the knowledge, values, and evaluation of the present (Grunwald, 2019). Empirical investigation (Grunwald, 2019) and logical deduction (Goodman, 1954) are impossible for future facts and processes. As Grunwald (2019) argues, we have empirical access to present images of the future, but not the future present in itself. There are many alternative ways of imagining the future and justifications as to what we might expect of the future. Due to this, when we can address futures in a plural and when techno-visionary futures, like far-reaching human augmentation and cyborgs, are discussed, we are not talking about whether and how these developments will materialize (Grunwald, 2019; Mannermaa, 1986; Luhmann, 1998). What we are discussing is how we imagine and evaluate these futures today and how to a considerable extent, these images of the future vary greatly.

"Futures are thus something always contemporary and change with the changes in each present" (Grunwald, 2016). It could therefore be argued that when future events are 'seen,' it might not be the actual event that is being 'seen,' but what is being observed are the causes and signs of these visions, which already exist in our current world. These causes and signs are already conceived in the human mind, and from them arise future predictions (Augustine, 397).

Futures do not arise unexpectedly or in a vacuum. As already explained, sociotechnical imaginaries are social constructs – because they are man-made, they cannot be discovered (Grunwald, 2019). Most sociotechnical imaginaries decrease quickly as they find no resonance with a more significant mass; some imaginaries "survive" (Grunwald, 2019). Survival of an imaginary entails that it motivates groups and actors to either contribute to or resist the visions. Both reactions, negative or positive, ensure that the imaginary lives and a respective future begin to form, leading to actual impact (Selin, 2007).

The audiences of most imaginaries also vary, with a few visions finding an audience via the mass media resulting in a tangible impact on public debate on a larger scale. In contrast, other visions find their way into the political arena resulting in political decisions (Grunwald, 2019). Lösch *et al.* (2016) also identify that imaginaries in specific science and technology fields have varied throughout history. For example, spaceflight has been filled with sociotechnical imaginaries which have failed to realize. Nonetheless, these imaginaries remain a source of fascination and inspiration to many and continue 'surviving.' The persistent narratives of an artificial space station and human settlement on Mars continue attracting funding from the public and private spheres.

As Grunwald (2019) summarizes: "Because futures are man-made, they have authors involving intentions, objectives, and purposes. The designing of futures is purposive action, intended to provide orientation, to create fascination, to promote a certain line of development, to attract research funding, to raise awareness in public, to initiate a debate, or to support partisan interests". To build a sociotechnical imaginary, background data, knowledge of correlations or regularities, estimates and assumptions of importance, and a process of assembling all these units, are needed (Ibid.).

The knowledge structure behind imaginaries can be pretty hazy and may consist of multiple elements, which can seem, at times, quite divergent. Grunwald (2016) gives a rough approximation, while not claiming completeness, that the following sources of knowledge may be used to build an understanding of imaginaries: (1) *Present knowledge*, which is knowledge proven and tested by currently accepted criteria, often by academics and researchers in the respective field; (2) *Estimates of future developments*, which do not represent present

knowledge but can be confirmed by it. Examples of such developments could be demographic changes, the velocity of advances in technology, and energy consumption trends; (3) *Values and normative expectations* of the future society, such as the relationships between society and nature and between humans and technology; (4) *Ceteris paribus* ('all other things being equal) *conditions*, which are conditions that we can expect to stay constant and to lack disruptive change; (5) *Ad hoc suppositions*, which events that are taken as givens, such as the absents of events like catastrophic repercussions of a comet on the Earth; (6) *Speculative proposals*, such as utopian and dystopian ideas of the world created in science fiction stories and other imaginations.

The Harvard Kennedy School STS research platform identifies that the " methods best suited to the study of sociotechnical imaginaries are the interpretive research and analytic methods in science and technology studies that help illuminate the structure-agency relationship." Just like Grunwald (2019), the Harvard STS Research Platform also indicates that these methods are by no means specific to analyzing imaginaries, but they can be applied in a way that is adjusted to the concept. A compelling argument on sociotechnical imaginaries is usually dependent on creative juxta positioning of data and knowledge from multiple methods and various sources. The platform identifies the following qualitative methods as the most frequently used: (1) discourse, (2) images and representation, (3) ethnography, (4) cases and controversies, (5) comparisons, and (6) utopias and dystopias.

In the next section, I will outline some identified imaginaries in the Chinese sphere of influence. After this, I will come back to further expand on the role of science fiction in creating and amplifying imaginaries – specifically AI narratives – as in the scope of my thesis, science fiction will be my primary source for my empirical research on Chinese AI imaginaries.

2.1.3. Sociotechnical Imaginaries in China

While there are sociotechnical imaginaries that China shares with other countries, there are times when Chinese sociotechnical imaginaries visibly diverge from those in other nations (Wittrock *et al.*, 2021). For example, the EU's outlooks on Responsible Research and Innovation (RRI) differ from many visions in China (Ibid.). According to Wittrock *et al.* (2021), in China, there is a "strong emphasis on the applied and societal orientation of research at the expense of ideals of value-freedom and neutrality of science." These imaginaries, thus, offer alternatives and potential for global adoption of them, but also the opportunity to reinterpret our future from a Chinese perspective. Sociotechnical imaginaries in China have some unique characteristics (Ibid.). While the private sector does propagate sociotechnical discourse, the discourse is nonnegligible to the discourse cultivated by the government (Zeng, Chan, and Schäfer, 2020). In China, heavily state-led sociotechnical imaginaries emphasize contributions to the socialist society and economic development, the "great rejuvenation of the Chinese nation" (中华民族伟大复兴), and the "Chinese Dream," as defined by the CPC (Ibid).

A pivotal and current *framing* of science and technology in China lies within what is known as the 'Chinese Dream' (中国梦, *Zhōngguó Mèng*) (Wittrock *et al.*, 2021). The concept first rose into popular discourse when in the Nineteenth Communist Congress, president Xi used the term to envision how science and technology, along with institutional reform, would rejuvenate the Chinese nation through the increase in productivity, facilitation of global cooperation, and the meeting of the people's needs (Peters, 2019). In the western world, the pundits quickly concluded about this 'dream' (Chai and Chai, 2013). In England, the Telegraph emphasized how the 'Chinese Dream was a call for China to rise to the central stage of the world again

(Moore, 2013). In the United States of America, unsurprisingly, the 'Chinese dream' was likened to the 'American dream' and seen as a slogan to rally around the party (Page, 2013). Arguably the most respectable newspaper in China, Cáixīn Chuánméi (财新传媒), took an entirely different stance and zeroed in on the happiness of the nation: "the fulfillment of China's top national priorities requires a renewed focus on happiness" (Chai and Chai, 2013). According to an opinion piece in Qiú Shì (求是, lit. 'seeking truth'), the Chinese Dream is about "Chinese prosperity, collective effort, socialism, and national glory." Peters (2019) argues that the Chinese Dream is pragmatic and linked to clear targets, goals, and planning. He refers to three interconnected narrative strands: *Marxist, Confucius, and Liberal*.

It is essential to understand the cultural significance of the Chinese word 'dream' (*meng*, 梦) as the usage allowed new imaginaries to be conceived. The Chinese Dream can be dated back to is to the Zhuāngzi (莊子) (Chai and Chai, 2013) – one of the two foundational texts of Taoism, along with the Tao Te Ching (道德经) – in which Zhuangzi's dream⁵ can be interpreted to correspond with "the Twin Pillars of Confucian Utopia: Li and Yue (Shengjun, 2013)". Li 禮 can be defined as rules of propriety, while Yue (樂) is music and beauty. Li is "rigid and distinct," Yue "flows and requires a mutual exchange to function" (Chai and Chai, 2013). This humanist philosophy was abandoned until 1976, the death of Mao Zedong, and while Xi's true intentions behind the 'Chinese Dream' are unknowable, the introduction of a historically significant term introduces a linguistic pathway back to these Chinese humanistic traditions.

5. According to Yao (2013) "the parable of the butterfly dream is one of the most interesting and influential passages among Zhuangzi's beautiful writings" and is central to Chinese thinking. In his article, Yao (2013) interprets the butterfly dream through an interdisciplinary approach. "The review of mythological and religious sources reveals that the image of the butterfly is widely understood to symbolize the human self or soul. The scientific study of dream experience touches upon the issue of self-consciousness and the sense of two-tiered self. The philosophical and psychological perspectives further highlight the tension between the *wu* 吾-self and the *wo* 我-self, self and ego, bodily and spiritual soul" (Yao, 2013).

The 'Chinese dream' is thus open to multiple interpretations of narrative that cultivate the popular imaginary (Peters, 2019). Chai and Chai (2013) argue that the Chinese Dream contains both "Confucianist ideals" and "contemporary profit-oriented capitalism." Chai and Chai (2013) add that "the most significant part of Xi's Chinese Dream is not how the West tries to define it, but rather that for the first time since Mao's victory in 1949, instead of endless self-sacrifice, Chinese are now encouraged to dream".

AI plays a pivotal role in the Chinese Dream and the "great rejuvenation of the Chinese nation." The Chinese "Next Generation Artificial Intelligence Development Plan" (AIDP) proclaims: "AI has become a new focus of international competition. AI is a strategic technology that will lead in the future; the world's major developed countries are taking the development of AI as a major strategy to enhance national competitiveness and protect national security" (Bereis and Katzenbach, 2021). Of course, as Bareis and Katzenbach (2021) point out, it is not solely a Chinese rhetorical device to portray AI as an inevitable and hugely disruptive technology crucial for grandiose legacy and international competition. In analyzing Chinese, French, German, and American policy documents, Bareis and Katzenbach (2021) found striking similarities in the narrative building of AI strategies. In all documents, the future of AI is established as inevitable yet uncertain, and thus the leaders of all nations call for a need for leadership intervention and build national rhetorical pathways full of opportunities (Ibid.). While the construction of narratives seems relatively uniform in all four nations, the corresponding sociotechnical imaginaries are different and reflect political, economic, and cultural differences. Governments pour massive resources and investments into these imaginary pathways, contributing to the coproduction of the pieces of these various futures (Ibid.).

In the case of China, Bareis and Katzenbach (2021) argue that within AI lies a promise of a cure, a "technological fix," to societal problems: "AI brings new opportunities for social construction. China is currently in the decisive stage of comprehensively constructing a moderately prosperous society. The challenges of population aging, environmental constraints, etc., remain serious" (AIDP, 2017). Due to this, Bareis and Katzenbach (2021) have identified that the Chinese government asserts and necessitates decisive leadership: "We must strengthen organizational leadership, complete mechanisms, take aim at objectives, keep tasks closely in view, realistically grasp implementation with a spirit of hammering nails, and carry out the blueprint to the end" (AIDP, 2017). The CPC paints a picture of AI as a tool for the establishment of social order and regulation (Ibid.): "Based on the goal of improving people's living standards and quality, speed up and deepen the applications of AI, increase the level of intelligentization of the whole society to form an all-encompassing and ubiquitous intelligent environment" (Ibid.). Furthermore, the AIDP (2017) states that "AI technologies can accurately sense, forecast, and provide early warning of major situations for infrastructure facilities and social security operations; grasp group cognition and psychological changes in a timely manner; and take the initiative in decision-making and reactions— which will significantly elevate the capability and level of social governance, playing an irreplaceable role in effectively maintaining social stability."

To meet such targets, the government of China aims for the "intelligentization" and "smartification" of all possible aspects of society (Bareis and Katzenbach, 2021). The totality of AI is outlined through buzzwords in Chinese strategy papers; for example, AI is associated with words such as "intelligent robots," "smart cities," "facial biometric identification," and "Industry 4.0" (Ibid.). Bareis and Katzenbach (2021) note that an incessant form of citizen (self-)monitoring, optimization, and adaption are a consequence of a sociotechnical imaginary

where social order is embodied through visions of "data behaviorism" (Rouvroy, 2013) or cybernetic governmentality through "environmental-behavioral control" (Krivy, 2018). The Chinese government attests to a sociotechnical aspiration for "simplification and standardization of human subjects to govern them more efficiently" (Jasanoff and Kim, 2009). This is portrayed in the AIDP (2017) in lines such as AI is to enable "the construction of public safety and intelligent monitoring and early warning and control system".

Wittrock *et al.* (2021) have identified that Chinese scientific, technological, and innovational imaginaries have evolved in three phases through changing policy goals. The three phases are all embedded in the tradition of the Chinese government to emphasize the societal services and benefits brought by applied sciences and have evolved due to "shifting priorities of social contribution" (Guo and Ludwig, 2021). Wittrock *et al.* (2021) argue that the first phase is constructed through "dialectics of nature" (Engels, 1883/1925), which offers an alternative of science as a service to communist society instead of being purely bourgeois. The second phase was influenced "Reform and Opening-Up" policy of Deng Xiaoping (1978–2012), and sociotechnical imaginaries were expanded beyond communist science to the successful development of a market economy. Xi Jinping (2012–) brought about the third phase with his thoughts on the 'New Era of Socialism with Chinese Characteristics. Sociotechnical imaginaries focused on economic development, while the need to control science and technology grew to enable a more socialist society built on Chinese values.

Societal goals and values are heavily controlled and defined by the centralized power of the party and government, and sociotechnical imaginaries are heavily influenced by narratives such as the following statement from Hu (2012): "Core socialist values are the soul of the Chinese nation and serve as the guide for building socialism with Chinese characteristics [...] We

should promote prosperity, democracy, civility, and harmony, uphold freedom, equality, justice and the rule of law and advocate patriotism, dedication, integrity, and friendship, so as to cultivate and observe core socialist values". As noted by Zhao *et al.* 2018, current emphasis on economic growth while simultaneously underlining societal contribution, may form tensions: "On the one hand, the pursuit is towards the socialist ideal of national development, common prosperity, social harmony and improved quality of life; on the other, it focuses on the philosophy of the market economy, featuring individual achievements and fair competition. These two aspects stand in conflict yet have common grounds, such as the pursuit of economic development".

To symbolize and conceptualize the broad imaginary of the Chinese Dream, Xi has also developed an evolving and dynamic idea of the Belt and Road Initiative (BRI). The BRI is an integral part of how Chinese international development is envisioned, as it is partly a design for a foreign policy relying on cooperation. The BRI began as a model of infrastructural development, which would connect China to the world through a new form of impartiality of Chinese globalization in finance, trade, and cultural exchange. Embedded in the rhetoric of the BRI imaginary is the revival of the Silk Road – an ancient trade route that connected the Western world, the Middle East, and Asia (Chajda, 2021). However, the BRI vision goes beyond the historical Silk Road regions and extends to *Tianxia*⁶ (天下), "all-under-heaven"

6. The cosmological system of *tianxia* (天下), "all under heaven," is strongly linked to the Confucian world order and has been regulating the loose system of international relations in China (Zhao, 2021). The system of 'All-under-Heaven' can be viewed as idealistic realism or realistic idealism, as, as system desires to find optimal solutions for conflicts of interest in global politics. The following traits of the notion of *tianxia* are worth underlining: (1) "'All-under-Heaven' is not a utopia at all, but rather an ideal that can actually be realized", (2) "the goal of a politics of *tianxia* is to resolve the problem of conflict by transforming hostility into hospitality", and (3) the "vision of 'All-under-Heaven' is grounded in three constitutive concepts, namely the 'internalization of the world', relational rationality, and 'Confucian Improvement'".

(Peters, 2019; Zhao, 2021). The BRI embodies "the Chinese vision of globalization in the twenty-first century" (Gromova, 2021).

The basic idea of the BRI is that Chinese funding matches the technological and infrastructural needs of the Pacific, South America, Africa, and the Eurasian landmass (Peters, 2019). Currently, a vast category of different global projects, more than 3000, have been signed under the BRI initiative (Layton, 2020), of which 60% are said to be on their way. Over 120 nations and around thirty international organizations have signed agreements of cooperation. What is important to note, though, is that the BRI is not only about 'hard' infrastructure. Peters (2019) also raises awareness of the BRI encompassing 'soft' infrastructure, by which he means "digitally-enabled cultural forms that allow new forms of cultural interaction and diffusion, interculturalism, education, and dialogue – the new Digital Silk Road."

'Soft' infrastructure encompasses trade facilitation, finance development, and broader cultural and educational exchange at multiple levels. In fifty years, this infrastructure is assumed to be an essential sphere of Chinese global diplomacy. As Peters (2019) analyses: "The term 'infrastructure' and the mode of development – 'infrastructuralism' – has the capacity to develop interconnectivity between material infrastructures and cultural superstructures, and to protect borderless 'natural structures' (regional environments) as part of the whole ." However, while the BRI has attained public acceptance through the rhetoric of wealth and prosperity as well as peaceful relations and global opportunity, the imaginary also portrays a future of surveillance and techno-enabled authoritarianism. This imaginary could limit the individual freedom of people outside of China and the sovereignty of other nations. According to Peterson (2019), Chinese companies have already worked with governments in other countries to develop surveillance technology and capabilities. The Chinese government has also offered training for

nations interested in joining the Digital Silk Road initiative on how the internet can be monitored and censored in real-time.

Generally speaking, the Chinese population seems to accept the politics of surveillance technology (Liu and Zhao, 2021). Liu and Zhao (2021) believe this is due to "a sociotechnical imaginary rooted in a nationally bounded collective vision in China that pushed the adoption of such technologies as mandatory for wide distributions in everyday situations ." The sensemaking process of surveillance technologies is strongly determined by culturally general assumptions (Feenberg, 1992). While in the West, surveillance technologies are seen to come with unpredictable and uncontrollable risks (Ram and Gray, 2020; Singer and Sang-Hun, 2020), in China, this does not seem to be the case, as seen in a recent study by Liu and Zhao (2021) that looked at China's pandemic response and surveillance technologies. In this study, Liu and Zhao (2021) found that during the COVID-19 pandemic, sensemaking and social imaginaries were exemplified through words such as "加强 (reinforce)," "助力 (boost)," "创新 (innovation)," "推动 (enhance)," and "赋能 (empower) ."All these words implied that there was a necessity to employ state-dictated surveillance technologies and policies (Liu and Zhao, 2021).

Even though some concerning reports of personal data leakage have surfaced (e.g., Xu, 2021), the government's surveillance technology use is validated as it is "what a government does" (Shi and Lu, 2010) rather than the procedures of administration (Liu and Zhao, 2021). In conclusion, embedded in China's imaginary of surveillance technologies is shared sensemaking underpinned by a steadfast faith in technology along with administrative reasoning and media (Ibid.). Dihal and Wu (Third Global AI Narratives China Workshop, 2020) reason that due to the media and government in China, which tend to portray more of AI's benefits compared with

negative perceptions towards AI in the West, Western publics have a more negative perception of AI than Chinese publics (Cave *et al.*, 2019). Thus, the ethics⁷ discussion around the topic also differs from the one in the West (Cave *et al.*, 2019).

It is not to say that the Chinese Dream or AI narratives are understood similarly by the whole population, nor that the government would have complete control of imaginaries within the nation. A study by Wang and Kuntz (2021) looked into how university students in China interpreted and represented the direction of a "New Era," as stated by the government. The study found "how different forms of media, as well as ideological and political curricula and activities, informed student participants' unsystematically and sentimental national imaginaries ."The findings showed that the meaning of policies was reworked through own imaginaries instead of purely taking up the governmental voice. Wang and Kuntz (2021) argue that students' imaginaries were more informed by visions offered and shared through social media than ideological and political education. The students' national imaginaries had plural and inconsistent value orientations, articulating a fervent nationalist aspiration with the apathy of socio-political issues and an uncritical admiration of the west" (Wang and Kuntz, 2021).

Even in China, national imaginaries come under frequent scrutiny on a local level. Batel and Devine-Wright (2015) find that this indicates that there may be a mismatch between the sociotechnical imaginaries formulated by national policy and those constructed by local communities. An article by Huang and Westman (2021) argues that the general portrayal of

7. Policy priorities can be quite complicated to interpret, because we lack exact translations (and the intellectual history associated with them) for Western concepts such as 'responsibility' and 'ethics' in Mandarin (Zhao *et al.*, 2018). To exemplify this, Zhao *et al.* (2018) point out that "in policy documents ethics is more widely used as 'adherence to moral norms', but those norms are not explicated in those documents". Zhao *et al.* (2018) continue by explaining that these norms seem to refer to "more to Confucianist norms for the appropriate social and family relations than to Western-style rules for resolving the value conflicts that innovations can give rise to".

Chinese imaginaries in academic literature is too focused on the state imaginaries being able to represent the nation in its entirety (Tidwell and Tidwell, 2018). However, according to Huang and Westman (2021), state imaginaries often lack resonance with the experiences and future visions of ordinary people. Tidwell and Tidwell (2018) materialize this as a 'gap' between manifestations of sociotechnical imaginaries in policy and the assumptions of the public. Official imaginaries are often technocentric and fail to represent the humane called for by local communities. Like Jasanoff et al. (2007) note, "states have not always correctly discerned the needs and wants of their publics with respect to technological developments."

The "gap" is notably acute in the Chinese context (Huang and Westman, 2021). Huang and Westman (2021) state that "the image that emerges from sociotechnical imaginaries in China is that of a set of ideas monopolized by discourses and ideologies of the state, possibly influenced by business interests, but primarily dictated by the government ." They continue to argue that this depiction is a misrepresentation of society in China and a misrepresentation of sociotechnical imaginaries. In reality, there is complexity and ambiguity in the relationship of actors and a lack of clarity between grassroots ambitions and the state (Huang and Westman, 2021).

Although sociotechnical imaginaries can be studied through an analysis of national political culture (Jasanoff et al., 2007), they cannot be separated from philosophies and cultures ingrained in social practices and worldviews (Huang and Westman, 2021). While the state is often understood as an authoritative power when it comes to narrative construction, the case of "ecological civilization" (shengtai wenming 生态文明) in China arguably shows that from a cultural perspective, the state is inseparable from society (Ibid.). The "ecological civilization" has become a widely supported imaginary through the convergence of public sentiment and

party rhetoric. Huang and Westman (2021) outline that "the convergence between party rhetoric and public sentiment has allowed for the construction of ecological civilization as a widely supported imaginary ."The "green public sphere" has made way for China's imaginary of the " ecological civilization" to represent a resonance between sociocultural dynamics and state-induced discourse (Huang and Westman, 2021).

The "ecological civilization" has appeared in the constitution since 2018 and is primarily attached to Xi Jinping. The word has appeared 4000 times in published Chinese articles and books and more than 170,000 articles in mainstream media since 2007 (Heurtebise, 2017). It is a unique term because it is a state-drive and environment-centered vision of the future and is described as "a socialist, ecological future with Chinese characteristics" (Jiang, 2013). Shengtai wenming is more than a mere policy and law-making framework and is aimed at a more environmentally sustainable world engraining moral and socio-political dimensions. According to (Hansen *et al.*, 2018), it is a sociotechnical imaginary that "integrates certain cultural and moral values with technological and political goals" It is portrayed as Chinese ecological wisdom and draws upon Chinese nature aesthetics and philosophy.

This imaginary has been built to contest the overindulgent western lifestyle. "China is a socialist country and cannot engage in environmental colonialism, nor act as a hegemony, so it must move towards a new type of civilization" (then-Vice Minister of Environmental Protection Pan Yue in 2006, qtd. in Zhou, 2006). The "ecological civilization" is "a state promoted imaginary of a Chinese socialist, and eventually global form of 'civilization,' built on growth, production, trade and a responsible way of dealing with natural resources. The way to achieve this future, according to the logic of eco-civilization, is through technological and scientific advancements, proper political planning and implementation, and by means of social

control combined with the population's heightened environmental consciousness" (Hansen *et al.*, 2018). As a campaign to rectify the Anthropocene, the CCP promoted imaginary envisions a Chinese led, global transition, from a "western industrial civilization" to a "socialist ecological civilization" (Geall and Ely, 2018). The ecological civilization is arguably the most significant imaginary of a global future from a Chinese perspective (Huang and Westman, 2021).

The "ecological civilization" makes use of science and technology. Scientific and technological innovations are vital and central forces for developing the "ecological civilization" (Hansen *et al.*, 2018). Contrary to calling for fundamental changes in the world economic system or redistribution of resources, shengtai wenming calls on images of the "green engine" – a move from an economy based on industry to one based on knowledge. Ideologically this means making room for more machines by de-centering humans (Ibid.). Hansen *et al.* (2018) even point out that more recent documents on "ecological civilization" highlight which technologies are compatible with the imaginary and which are not. Technologies have been labeled as either "black" or "green" technologies. For instance, the president of the Chinese Academy of Sciences, Bai Chunli, introduced 15 Priority Research Programs, out of which six were undeniably depicted as programs to build the ecological civilization (Bai, 2014). In addition, the Central Committee of the Communist Party of China and the State Council issued the general Guideline of Accelerating the Development of Ecological Civilization, which placed sci-tech as the only mean of achieving an "ecological civilization" (Xinhua News Agency, 2015).

Chinese political leadership has arguably created a state vision attuned to societal sentiments by embedding cultural memory into state-led narratives (Hansen *et al.*, 2018). Simultaneously

local projects have rehabilitated a similar system of thinking, which has contributed to the "common cognitive construction" of the sociotechnical imaginary of "ecological civilization" (Ibid.). Hansen *et al.* (2018) derive that "as elsewhere, sociotechnical imaginaries are co-produced in China through interactions between knowledge, normativity, and materiality."

I conclude this chapter by arguing that current sociotechnical imaginaries in China emphasize (1) *expansion and globalization* through digital means as exemplified by the Belt Road Initiative (BRI) and the Digital Silk Road (DSR), (2) *common good above individual freedom* as seen in visions regarding surveillance technologies, and (3) a *desire to bring back cultural memory and connect to nature* as envisioned in the sociotechnical imaginary of the "ecological civilization."

2.2. Science Fiction Literature

"A critical . . . reading of science fiction is essential training for anyone wishing to look more than ten years ahead."

– Arthur C. Clarke (1963)

"Science fiction can be a bridge for China to communicate with the world, as a side product of modernization. It is a world language."

- Han Song (2021)

"I believe that, before setting pen to paper for each story, the key is to always orient the story in the history of its genre in a greater social context. As someone deeply invested in, even

obsessed with, the fantasies of science fiction, I am in awe of how inclusive the spectrum of science fiction storytelling is. Any theme or style can find its place in the genre.”

– Chen Qiufan (2021)

2.2.1. Science Fiction in Imagining AI Futures

According to Sartori and Bocca (2022), narratives are a building block of broader sociotechnical imaginaries and are crucial in molding how society views, interprets, and organizes technology. Creating narratives and imagining alternative futures – dystopian and utopian – has never been entirely controlled by the discourses and decisions of official state actors and other institutions (Harvard Kennedy School STS research portal). Artists, authors, and filmmakers have played a crucial role in collecting and imagining trajectories for societies intertwined with science and technology. These works are often classified under the genre of Science Fiction⁸, which is "fiction dealing principally with the impact of actual or imagined science on society or individuals or having a scientific factor as an essential orienting component" (Merriam-Webster Dictionary).

8. There is much debate on what belongs to the genre of Science Fiction and what not. As with most genres it is built on the notion of “family resemblance” (Wittgenstein, 1953). Kincaid (2003) suggests that there is no “unique, common thread” that would help us connect all SF together, nor is there “unique, common origin” for the genre. According to Kincaid (2003): “Science fiction is not one thing. Rather, it is any number of things: a future setting, a marvelous device, an ideal society, an alien creature, a twist in time, an interstellar journey, a satirical perspective, a particular approach to the matter of story, whatever we are looking for when we look for science fiction, here more overt, here more subtle, which are braided together in an endless variety of combinations”. (“On Defining SF, or Not: Genre Theory, SF, and History”) Rieder (2010) suggests that “rather than sorting out true sf from the genres in its proximity or trying to find its primal ancestors, it is far more useful to take stock of the way that sf gradually comes into visibility in the milieu of late nineteenth-century narrative: imperial adventure fiction, the extraordinary voyage, the romance revival of the 1880s and 1890s in England, the boy-scientists of the American dime novel, Utopian writing, the future-war motif, and so on”. Thus, for the sake of my research, I will focus on narratives, which are situated in the future and go under the umbrella term of science fiction in popular discourse.

Jasanoff and Kim (2015) note that science fiction can serve as "a repository of sociotechnical imaginaries." At times, artistic visions have proven robust enough to become generally shared cultural imaginaries. Although Jasanoff and Kim (2015) do not have any detailed case studies of SF as a producer of sociotechnical imaginaries, they gesture toward it being a promising field of investigation. Science and Technology scholars have historically been interested in how SF influenced popular technology thinking. For example, the film *Gattaca's* influence on U.S. policy on gene editing has been examined (Kirby and Gaither, 2005), and Mary Shelley's *Frankenstein's* impact on current ethical reflections on scientists' responsibilities for their creations (Cambra-Badii *et al.*, 2021).

The interest in SF is founded. In 1945, before the first satellite was launched into Earth's orbit, Arthur C. Clarke famously contemplated potential long-distance communication via radio signals bouncing off satellites. Today's smartphones and watches resemble the communicators in *Star Trek*, and driverless cars, as seen in *Knight Rider*, are not fiction anymore. *2001: A Space Odyssey* inspired the International Space Station. These are only to name a few sources of inspiration. The imaginations of pop culture and media, in particular, the alternative realities imagined by SF, are, by all means, an inspirational source for the digital innovation of engineers, designers, and computer scientists (Finn and Cramer, 2014; Shedroff and Noessel, 2012). Dunne and Raby (2013) add that SF's value is also in the critique it holds: "By acting on people's imaginations rather than the material world, the critical design aims to challenge how people think about everyday life."

Jordan *et al.* (2018) have studied how scholars of human-computer interaction (HCI) implement SF in their work. Not only does their study indicate that SF is used in the field, but it seems to be having more impact than before. In their study, Jordan *et al.* (2018) investigated

papers presented at the ACM Conference on Human Factors in Computing Systems in 1982, searched them for terms related to SF, and then categorized the results. The research team found that there were a variety of diverse ways researchers in the field used SF. One way SF is being used is for theoretical design research. Another way is through exploring new mediums of HCI by referring to SF as a shaping force.

Also, the study of human body modification is explored using SF as a medium. Jordan *et al.* (2018) explain that "sci-fi movies, shows or stories do inspire the foremost and upcoming human-computer interaction challenges of our time, for example, through the discussion of shape-changing interfaces, implantables or digital afterlife ethics." The team's most significant contribution is that they found that SF is mentioned in research more often today than ever before and that its role in academia seems to be changing. SF has been used in the 21st century as a tool for analogies, models, and metaphors that depict the findings of the research (Bina *et al.*, 2017; Kotasek, 2015; Hansen, 2004; McIntire, 1982; Toscano, 2011).

Science Fiction, by no means, belongs among the most reliable sources on which to base future predictions. Most future images painted by SF never become our reality. For example, in Edward Bellamy's novel *Looking Backward* (1888), Bellamy imagines a complete reorganization of housework, where time does not need to be spent on daily chores. Although utopian in many ways, in this vision, women were limited in their political rights and professional options because of their limited use in the labor force. Buhanan (2016) argues that Bellamy misunderstood the relationship between economics, technology, and social contracts and thus had a limited capacity to imagine the world. Buhanan (2016) contemplates that "by today's standards, Bellamy was a person with hopelessly outdated attitudes towards the question of gender equality, unable to imagine his way out of his contemporary prejudices."

Luegenbiehl (1984) observes a similar shortcoming in Georg Orwell's *1984*, in which technological development is seen as a means to end totalitarianism because "wealth will no longer create a distinction between people, and their leisure time will allow them to begin thinking for themselves [which ultimately] ...will result in the overthrow of the existing social structure". Luegenbiehl (1984) continues by exemplifying how many of Orwell's sociotechnical imaginaries failed to be realized. It is not enough for literature to imagine futures; to become driving forces of the present, narratives must be connected to beliefs about the environment of the imagining subject (Roßmann, 2021). For this connection to exist, "people need to believe, not in imagined futures but rather in contestations, for instance, relating to their feasibility, desirability, or usefulness" (Ibid.). Examining implications, 'a proposition one has in mind,' or a game of make-believe (Walton, 1990), motivates action – not the science fiction narrative itself (Roßmann, 2021).

However, even if our greatest speculative writers cannot offer us a dependable guide to what is just around the corner, that is scarcely a reason to give up on the genre. As Huntington (1975) argues, "[t]hough SF often gives us a sense of facing the unknown, its true insights are generally into the known, and its primary value lies not in its ability to train us for the future, but in its ability to engage a particular set of problems to which science itself gives rise and which belong, not to the future, but the present." What makes SF worthy of research is not that it offers us truths on when and how, for example, our brains will be connected to the internet, robot overlords will take over, and we will settle on Mars. The potential of SF lies in its ability to reflect on the human psyche and our societal struggles in a world which is changing faster than ever due to technology.

Researchers such as Menadue and Cheer (2017), Stableford (1979) as well as Tymn (1985) support my view. Menadue and Cheer (2017) argue that "science fiction questions the role, relevance, costs, and benefits of current and future technologies, and presents ideas that can influence public opinion." Stableford (1979) claims that by modifying attitudes towards the significance of current and future science and technology, SF could determine the worldviews of individuals. Tymn (1985) agrees that SF, as a form of literature, provides tools for accepting change as something inevitable and natural. Psychological and sociological studies (Nyhan *et al.*, 2014; Prochaska *et al.*, 1992) have exemplified how difficult accepting change is for humans, and most tend to resist authoritative statements of fact. SF can help because it has a "direct effect" on how individuals and groups interpret scientific changes (Stableford, 1979).

Humanities and cultural interaction studies have not become obsolete in the world of science and technology. As has already been discussed, we shape the world through narratives. One of the pivotal narratives SF is shaping is our relationship with Artificial Intelligence (Hudson, 2021). Some researchers argue that our culture is deeply permuted by the intermingling of facts and SF (Menadue and Cheer, 2007). Geraci (2007) even considers saying that this dynamic has changed our existential relationship with God. Other researchers do not engage in such claims but still find it helpful to "addresses the gap between familiar popular narratives describing Artificial Intelligence (AI), such as the trope of the killer robot, and the realistic near-future implications of machine intelligence and automation for technology policy and society" (Hudson *et al.*, 2021), because "[SF] plays an informal and largely unacknowledged role in setting public expectations and understanding about technology in general and AI in particular" (Noessel, 2018).

In an "Untold AI"⁹ project, Noessel (2018) investigates how AI is displayed on screens by analyzing dozens of television series and movies and the moral frames and messages they imply about AI. These findings were then compared to guidelines found in multiple AI white papers and manifestos created by the techno-industry think tanks and advocacy groups. Noessel's (2019) findings show how SF narratives and policy recommendations on tech have shared visions. The various stakeholders of nonfictional AI and SF seem to align with concerns on multiple aspects of AI. However, Noessel (2018) labeled some narratives in SF as "pure fantasy." These narratives colored the story but had little to no usefulness in analyzing the present and future of AI in the material world. In addition, he identified that some imperatives and messages from the tech industry were not engaged within the realm of SF. These were labeled as "Untold AI" stories. What is not told in SF is equally as important as what is told.

There is a tendency to depict AI with overly pessimistic or optimistic tones (Fast and Horvitz, 2017). Dystopias and Utopias are ever-present and create windows to understand people's main fears and hope regarding technology (Sartori and Bocca, 2020). Research at the Leverhulme Centre for the Future of Intelligence at the University of Cambridge has also elucidated the SF AI imaginary. Cave and Dihal (2019) have identified eight main narrative scenarios regarding AI, four linked to fears and four to hopes.

Sartori and Bocca (2020) describe them in pairs as follows: (1) Immortality-dehumanization: In one scenario, AI will lead us to breakthroughs in the medical field, leading to the human race's immortality, while the other scenario depicts a world in which humans lose their values and emotions; (2) Freedom-obsolence: In the utopian scenario humankind is liberated from

9. For more information on "Untold AI" narratives, visit <https://scifiinterfaces.com/tag/untold-ai> (Noessel, 2018-2020)

tedious work leaving time for creative and social endeavors, while the dystopian scenario depicts AI making human meaningless and useless as it takes over all work; (3) Gratification-alienation: In the optimistic scenario AI and humans form a connection, which satisfies all human needs, while the pessimistic scenario sees AI replacing human interaction and spurring loneliness; (4) Dominance-uprising: The last scenarios depict AI as new tools either leading to a more peaceful world or ultimate destruction.

Research at the Leverhulme Center has also had a focus on the pursuit to build global AI initiatives through the identification of multiple cultural frameworks by which divergent populations govern and interpret AI (Hudson *et al.*, 2021). Both AI imaginary projects, the "Untold AI" and the projects of Leverhulme Centre, have identified challenges when trying to map AI imaginaries. AI narratives in SF often mimic or align with narratives in other media.

Trying to define AI in academia is challenging as such – defining AI in SF is no easier. While attempting to categorize AI systems illustrated in SF, Hudson *et al.* (2021) agreed to the vagueness of the process. The multifaceted nature of AI is often the barrier to efficient policy conversation and a broader cultural understanding of the potential impacts of future technologies. Williams, an AI ethics scholar at Virginia Tech., argued that "Defining AI is a moving target" (Ibid.). Indeed, there is yet to be a consensus definition of what is AI and what is not. However, AI researchers like Suren Jayasuriya of Arizona State University argue that it is better that no uniform definition can be found as we "do not want a policy that applies uniformly over a wide swath of technology" (Ibid.). According to Hudson *et al.* (2021), many also argue that definitions aim to hype products in a highly competitive investment environment. Brenda Cooper, an SF writer and an information technologist stated that "machine learning is just really good computation." It is not clear when computation transforms

into AI, and there is an inclination in businesses to describe their works as AI— whether intelligence or machine learning is applied or not (Ibid.). According to Bruce Sterling, a cyberpunk guru in academia, the situation is a bit different as "people keep renaming things to get grant money" and thus end up rejecting prior nomenclature (Ibid.).

The problem that often arises within SF is the neurological othering of AI. According to Hudson *et al.* (2021), AI is portrayed as incapable of comprehending specific dimensions of the human psyche. Such would be the case of love or the concept of family. An excellent example of this can be found in *Star Trek: The Next Generation*, in which the android Data is incapable of understanding human humor and emotions. Disability Studies have aided us in understanding that these narratives of othered minds are born from perceptions and interactions with neurodivergent people.

Similarly, we have a limited understanding of animal and plant cognition and expand how we define intelligence through disability. Neurodiversity lenses allow us to question "General Artificial Intelligence" (GAI), AI that is a replica of the human (Ibid.). Scientists studying the behavior of animals, such as Wasserman (2006) and Reznikova (2007), have found that myriads of species have thoughts, opinions, memories, emotions, problem-solving skills, preferences, as well as other cognitive capabilities that are often thought of as uniquely human, yet many animals also sense and engage with their environment in acutely unhuman ways. Hudson *et al.* (2021) suggest that we use these frames "to theorize about the multiplicity and diversity of intelligence in a future filled with many varied kinds of 'narrow artificial intelligence.'" They argue that this may even incline us to "recognize the ambiguity and arbitrary normativism we apply to cognition in society."

These ideas underline how "intelligence" might not be the best way to comprehend and imagine complex information technology. In a talk at the 2014 IMPAKT Festival, Sterling argued that there is "a category error" in the definition of AI. According to Sterling (2014), computation and cognition differ: "It is like thinking that birds have wings and drones have wings, and therefore one-day drones will lay eggs and birds will have radar." The technology industry and SF use the Turing Test rather than defining intelligence (Hudson *et al.*, 2021). This test suggests that if a computer is sophisticated enough to perform better than a human counterpart, it should be considered intelligent. Hudson *et al.* (2021) believe that we need a new, more open dialogue on what it is that technologists are creating. However, it is undeniable that this dialogue will always occur "in the cultural context of a mythos whose deeply entrenched notions of anthropomorphism, analogy, and familiarity shade all discourse around AI and machine learning" (Ibid.).

The ambiguity of intelligence is primarily due to it being associated with different components of human identity: "technical mastery of a skill or medium; interaction and empathy; anticipation and foresight; idiosyncrasy and the auto-poetic performance of the self" (Hudson *et al.*, 2021). This viewpoint makes it tempting to reject the "personhood" of AI as a philosophical fantasy irrelevant to the AI technologies that institutions are currently creating. However, AI Policy Futures advisory board member Madeline Ashby argues that a philosophical foundation builds, supports, and maintains policy regimes (Ibid.). Questions of slavery, fetuses, and zygotes have been, and continue to be, a "personhood" questions in our societies. Whether SF and sociotechnical imaginaries of AI use, as Sterling (2017) would call, "bad metaphors" or not, we cannot escape them and should be willing to converse abstract questions regarding AI (Hudson *et al.*, 2021).

AI Narratives in Recent Chinese Science Fiction highlight the occurring development of AI technologies and their unique role in our contemporary life (Xu, 2020). Sanfeng, a visiting researcher from the Southern University of Science and Technology at the Research Center for Science and Human Imagination, describes two essential shifts that have happened in the sphere of the last decade's groundbreaking SF stories:

(1) Connectionism has taken over symbolism as the practical approach to AI. Where symbolisms, also known as computationalism and logicism, use axiomatic logic systems as a guideline for an intelligent agent, connectionism, a form of bionics, advocates for similarly designing AI as neural networks in a human brain. Ted Chiang's *The Lifecycle of Software Objects* is an example of such "connectionist" SF. Also, Xia Jia (*Let us talk*), Hao Jingfang (*Where Are You*, 你在哪里), Chen Qiufan (*Image Builder*, 造像者), and Mu Ming (*Forging Dreams*, 铸梦), have attempted to search for the soul or consciousness in robots. "Algorithms based on neural networks have emerged as a popular focal point in their work" (Xu, 2020). According to Sanfeng (in Xu, 2020), "the credibility of AI's characterization in sci-fi stories increases when it is inspired or corroborated by algorithm theories."

(2) Readers have begun to expect SF authors to comprehend, describe and respond to AI's usage in the real world and the impact this might have on the emotional life of ordinary humans. Thus the role of SF in China has turned not so much to depict the future but the current, increasingly AI-filled reality and the conflicts, emotions, and ethics that come with the changes. According to Sanfeng (in Xu, 2020), several young authors have succeeded in this; *The Algorithms for Life* (人生算法) by Chen

Qiufan, *Into the River* (涉江) by Xia Jia, *My Girl* (姐姐) by Baoshu, and *The Question of Love* (爱的问题) by Hao Jingfang to name a few. (Xu, 2020)

Sanfeng (in Xu, 2020) hopes SF will "stay one step ahead of science so that it can be both a pioneering force and a salve for a fearful public." Hiroshi Yamamoto's *The Stories of Ibis* is an excellent example of SF that depicts a future in which AI and humans coexist in a symbiotic and collaborative relationship.

2.2.2. Contemporary Chinese Science Fiction Literature

Like in all cultures, there are plenty of fantasy elements in Chinese¹⁰ legends and myths, but whereas in Anglo-American SF literature, the line between SF and fantasy can be blurred, in China, the distinction between SF (Ke Huan, 科幻) and fantasy (Qi Huan, 奇幻) is usually much clearer (Wang, 2016) and hardly ever crosses beyond the realm of scientific theory. Until recently, Chinese SF was mainly unknown to the rest of the world. It was not before Liu Cixin's (刘慈欣) novel *The Three-Body Problem* (三体) became the first book to win the Hugo Award for Asia in 2015, and Hao Jingfang's (郝景芳) novelette *Folding Beijing* (北京折叠) won the second one in 2016, that Chinese SF began to be recognized. Lately, primarily through the efforts of Ken Liu, a Hugo-winning Chinese-American author and translator, Chinese SF is being translated into English, making the genre more widely read.

10. What can be defined as "Chinese"? Throughout my thesis, I use the word China and Chinese liberally and vaguely without defining the term. Most of the time when I use the term Chinese, it is linked to the government and the opinions of the Han population (which makes up 91%) of the population (Chiang *et al.*, 2019). It is important to remember that China is a vast nation with many ethnicities and minorities, whose views may not be represented in my thesis (Chu *et al.*, 1998). In addition, there is a clear divide between the urban and rural populations of China (Zhao and Li, 2019). I have made the conscious choice of not integrating this matter in my thesis, as my scope is already large to begin with, but I do see this as a flaw within my study.

According to Wang (2016), the genre of Chinese SF can be traced back to as early as 450-375 BC to a Taoist classic, *Liezi* (列子). In the chapter "The Questions of Tang" (汤问), a talented mechanic, Yanshi, constructs an automaton closely resembling a human. He then shows his creation to the King, who thinks Yanshi is fooling him because of how human-like the automaton is. In the end, Yanshi has to destroy his creation to prove he is not lying. This story can be seen as the first depiction of a robot in Chinese literature (Wang, 2016).

In the form known to us today, Science Fiction first appeared in China in the Late Qing dynasty (Wang, 2016). Liang Qichao (梁启超), Lu Xun (鲁迅), and other Chinese intellectuals stressed the importance of SF as a means to aid the country to prosper and in 1900, the first foreign SF, Jules Verne's *Around the World in Eighty Days*, was translated and published in China (Wang, 2016). Following this, several other SF novels, such as *From the Earth to the Moon* and *A Journey to the Centre of the Earth*, were translated into Chinese. Wang (2016) states that the earliest original Chinese SF novel, *Colony of the Moon* (月球殖民地) by Huangjiang Diaosou (荒江钓叟), was serialized in a journal, *Illustrated Fiction* (绣像小说) in 1904 and 1905 (Wang, 2016).

Historically, in China, literature is expected to fulfill various social responsibilities. At the dawn of the 20th century, SF was used to teach modern science and democracy from the West. According to Wang (2016), "most western SF was translated into Chinese was rewritten to serve this goal," and many copies were shortened. For example, Lu Xun's translation of *From the Earth to the Moon* by Verne was shortened from its original 28 chapters to 14. Another role of literature was to speak out one's opinion. Lao She (老舍)'s *Cat Country* (《猫城记》) was published in 1932 and is maybe the best-known Chinese SF globally before the new era. Though the novel ironically depicts an alien community, the story can be seen as a critique of

the turmoil that lasted from the late Qing Dynasty (1833-1911) to the Republic Era (1911-1949).

In 1949, the People's Republic of China was established, followed by the first wave of new-era Chinese SF. Much of the SF in China from the era was influenced by the Soviet Union. Works of writers such as Alexander Belyayev were translated into Chinese, and also Chinese names such as Zheng Wenguang (郑文光) and Tong Enzheng (童恩正) became popular (Wang, 2016). Most of the SF from this period was targeted as pop science or for kids and was thus optimistic and limited in scope (Liu, 2014). However, with the Cultural Revolution came the loss of appreciation for literature and even less for SF. Anything that could be traced back to "western capitalism" was a threat, and most writers discontinued their writing (Wang, 2016).

The late 1970s, the time after the period of reform and opening-up policy, marked the beginning of the golden age of Chinese SF (Wang, 2016). This was followed by "quasi-AI" stories appearing between 1978 and 1983 and gaining acceptance among the population (Second Global AI Narratives China Workshop, 2020). This was not the first time AI appeared in Chinese SF. According to Wu (in Xu, 2020), from the Research Center for Science and Human Imagination at the Southern University of Science and Technology, the term "Artificial Intelligence" had already appeared in pre-reform stories. However, the distinctions between computers (or, as translated from a common nickname in Chinese, "electronic brains" (Diannaο, 電腦)), robots, and AI were blurred, and all were "depicted as educational and obedient servants to humankind."

Only after the reform did a deeper exploration of AI begin in the works of some authors. Such exploration can be seen in the works of Xiao Jianheng (萧建亨) and Wei Yahua (魏雅华).

Xiao, examining machine learning, situational awareness, and algorithms, identified the period as a moment of enlightenment in how intelligent robots were depicted in Chinese SF. Wei also contributed to pondering moral reconstruction on a cultural and social level. The Chinese public, initially seeing robots as obedient servants, had begun to worry about the potentially rebelling AI. (Second Global AI Narratives China Workshop, 2020)

The anti-spiritual pollution campaign of the early 1980s briefly meant a break in the publishing of SF again. SF was stigmatized as pseudoscience and "spiritual pollution" because of engrained capitalism and commercialism. It was not until the decade's end that writers dared to write or publish SF again. After only selling 700 copies during the anti-spiritual campaign, in 1980, *Science and Literary*, the most significant Chinese SF magazine in the Chinese market, sold about 200,000 copies of each issue. In 1991, the magazine was renamed *Science Fiction World* (Kehuan Shijie, 科幻世界), and the same year the annual conference of World Science Fiction was held in Chengdu. According to Wang (2016), 1991 can be seen as the year SF in China began to flourish again. The sales of *Science Fiction World* peaked in 1999, selling 361,000 copies of each issue. This was due to an essay question in China's National Higher Education Entrance Exam in 1999: "What if memory could be transplanted?". The essay question mimicked the title of an article in the magazine that had come out earlier that year. (Wang, 2016)

Although, SF in China had slowly begun to sprout. It was not until the late 2010s that Chinese SF took on the global stage. Even within China, SF was primarily read by high school and college students and was often dismissed as juvenile literature (Wang, 2016; Liu, 2014). A breakthrough happened when Liu Cixin (刘慈欣) released *The Three-Body Problem* (san ti, 三体) in 2008 (published in English in 2014 as the first contemporary Chinese SF to be translated

into English and win the Hugo). The trilogy gained wide respect, first in China and then around the globe. The books even gained the attention of IT entrepreneurs, scientists, and engineers (Liu, 2014). A cosmologist and string theorist, Li Mao, even wrote a book titled *The Physics of Three Body*, and when CCTV, the largest state television broadcaster, attempted to discuss SF, over a hundred members of the studio audience started chanting a quote from the novel: "Eliminate human tyranny! The world belongs to Trisolaris!". (Liu, 2014)

Liu Cixin is, by all means, the most globally renowned contemporary Chinese SF writer, but many others have since followed him. Wang Jinkang (王晋康) is another relevant figure in Contemporary Chinese SF and has written such as the short story *Adam's Regression* (亚当回归, 1993) and the novel *A Song for Life* (生命之歌, 1998). He writes tales that focus on biology and have roots in the traditions of realism stories are deeply rooted in the tradition of realism and usually with a focus on biology. Han Song (韩松) is also worth mentioning with his well-established works such as the short story *Gravestone of the Universe* (宇宙墓碑, 1991) and the novel *Red Ocean* (红色海洋, 2004). His stories are somewhat Kafkaesque, and this style has garnered his attention. It is also essential to mention He Xi (何夕), the author of *The Sad One* (伤心者, 2003) and *Dooms Year* (天年, 2015), which have touched readers through exploring emotions and feelings. These writers are often called the "Big Four" of Chinese SF. (Wang, 2016)

However, the list of Chinese SF writers goes on with a plethora of up-and-coming young writers such as Chen Qiufan (陈楸帆), Bao Shu (宝树), Fei Dao (飞氲), Jiang Bo (江波), A Que (阿缺), Zhao Haihong (赵海虹), Ling Chen (凌晨), Chi Hui (迟卉), Xia Jia (夏笳), Hao Jingfang (郝景芳), Chen Qian (陈茜) and Tang Fei (糖匪) – to name a few more (Wang, 2016).

Many of their works have been made available to the English-speaking world through the translations of Ken Liu (刘宇昆), an American SF writer (Alter, 2019). Liu has translated five novels and more than 50 works of Chinese SF into English, making him a key figure in making Chinese SF accessible to the broader public and a shaper of the global SF landscape (Alter, 2019). Liu Cixin has even recommended that Chinese SF fans who speak English read the translation rather than the original copy of *The Three Body Problem*: "Usually when Chinese literature gets translated to a foreign language, it tends to lose something. I do not think that happened with *The Three-Body Problem*. I think it gained something." (Xu, 2020)

Liu's efforts as a fixer, an editor, and a curator of Chinese SF, cannot be stressed enough. According to Alter (2019), Liu has searched beyond traditional channels to find stories and extended his exploration to social media messaging platforms such as WeChat, Weibo, the self-publishing site Douban and even a forum for Tsinghua University alumni. Most curiously, he has friends who send him screenshots of stories published on apps that are not accessible outside of China. According to Alter (2019): Liu "has done more than anyone to bridge the imagination gap between the world's current, fading superpower and its ascendant one." Some of these works have been collected in two anthologies of Contemporary Chinese Science Fiction: *Invisible Planets* (2016), which features 13 visions of the future from China, and *Broken Stars* (2019), which features 16 stories from the new frontiers of Chinese Science Fiction.

Many of the writers translated by Liu use SF as a social critique of China's rapid economic and technological transformation. Often stories are set in the future or on another planet, so taboos such as the exploitation of migrant workers, the lack of social freedoms, environmental destruction, economic inequality, and government land seizures can be explored (Alter, 2019).

Liu has had to find ways to express the authors' social and political critiques indirectly, yet, some stories he has translated have not been officially published in China. "It is a very tricky dance of trying to get the message they are trying to convey without painting the writers as dissidents. Many Chinese writers are skilled at writing ambiguously, such that there are multiple meanings in the text. I have to ask them, how explicit do you want me to be in making a certain point here, because in the original, it is very constrained, so how much do you want me to tease out the implications you are making? And sometimes we have a discussion about exactly what that means and how they want it to be done" (Liu in Alter, 2019). Liu is making way for alternative sociotechnical imaginaries to the narratives provided by the government.

So, can Science Fiction be a valuable tool for understanding current Chinese sociotechnical imaginaries? To answer my first research question, I argue, based on my literature review, that Science Fiction shows promise as a possible tool and basis for an analysis of sociotechnical imaginaries. Nevertheless, it is unclear how representative contemporary Chinese SF is of the greater Chinese population and how it differs from Western literature. There does not seem to be a complete consensus on the matter.

According to Liu (2014), "any broad literary classification ties to culture – especially a culture as in flux as China's – encompasses all the complexities and contradictions in a culture. Attempts to provide answers will only result in broad generalizations that are of little value, or stereotypes that reaffirm existing prejudices". Liu (2014) continues to explain that "given the realities of China's politics and its uneasy relationship with the West, it is natural for western readers encountering Chinese science fiction to see it through the lens of Western dreams and hopes and fairy tales about Chinese politics. It is tempting, for example, to view Ma Boyong's *the City of Silence* as a direct attack on China's censorship apparatus or to read Chen

Qiufan's *The Year of the Rat* only as criticism of China's education system and labor market, or even reduce Xia Jia's *Hundred ghosts parade tonight* to a veiled metaphor for China's eminent domain policies in the service of state-driven development". Liu (2014) thus urges readers to approach Chinese SF as writing, which is trying to say something about all of humanity and not exclusively China.

However, panels on Chinese SF are standard, especially in academic conferences on Asian studies and Comparative literature, and many do argue that there is "Chineseness" to Chinese SF (Liu, 2014). Xia (2014) agrees that Chinese SF is connected to the collective fate of the global population, yet believes that the form of literature is primarily written for a Chinese audience and ponders on the future and problems of the people sharing the Chinese nationality. Although Xia (2014) acknowledges that contemporary SF authors in China have internal differences manifested through the region of origin, professional background, ideology, age, social class, and aesthetics, to name a few, she argues that certain aspects of commonality can be found.

Xia (2014) points out that SF in Europe and Northern America is built on the experience of the West of their political and economic modernization. While Chinese SF has unarguably taken specific settings, cultural codes, images, and narrative tropes from Western SF, these elements have been reconstructed into "a cultural field and symbolic space possessing a certain degree of closure and self-discipline vis-à-vis mainstream literature and other popular literary genres" (Xia, 2014). Chinese SF has matured into a national allegory in an era of globalization. The particular historical conditions that Chinese SF writers face also shape the literature. The failure of Communism to overcome capitalist crises and the globalization felt in people's ordinary lives, on the one hand, has played a significant role.

On the other hand, China has managed to resurge globally with a rapidly growing economy, bouncing back from a series of traumas unmatched by other nations (Xia, 2014). SF looks to the future. Moreover, as Song (2013) puts it: "in China, the future is now." According to Song (2013), "a writer in present-day China does not even have to make an effort to imagine the future, as any day-to-day record of urban China's dramatic transformations is futuristic. The realities of the country's rapid modernization are the stuff of fiction, and some SF writers are chronicling their most dynamic dimensions".

SF writer, Chen Qiufan, admits (in Xu, 2020) that the genre, to quite an extent, emanated from the West, and much of contemporary Chinese SF began by imitating the West in aesthetics, taste, and genre characteristics. As a writer of Chinese SF, he frequently contemplates how "Chineseness" is conveyed and whether simply applying specific structures, ideas and expressions is enough or should more symbolic factors be incorporated. According to Chen (in Xu, 2020), the dialogue on Chineseness has only just begun, and he expresses that "striving for a truly Chinese order of science and technology could bring us a new future worth exploring and imagining." Baoshu (in Xu, 2020) takes a more practical view: "Chineseness is descriptive instead of normative and ought not to shackle creativity," yet he thinks there are quite some differences between western and Chinese SF. It has become more common to combine SF's local cultural traditions and narrative motives, and conscious attempts have been made to identify and reinterpret cultural roots in a world of modern technologies. According to Baoshu (in Xu, 2020), filial piety, lineage, and heavenly Tao are Chinese elements that connect to a grander sense of history and can often be embodied in Chinese SF. He exclaims that "Chineseness is thus naturally revealed."

I conclude my literature review by arguing that SF can be a valuable tool for understanding Chinese sociotechnical imaginaries, as (1) Chinese SF has become popular and more widely read in the past decade, thus having a more significant influence on the thoughts of the population, within and outside of China, and (2) Chinese SF offers an alternative route to understanding Chinese sociotechnical imaginaries, as compared to the more dominantly researched government narratives. Of course, my answer is incomplete, and further analysis is needed. I will discuss this more thoroughly in the chapter *Research Limitations and Suggestions for Future Research*.

3. Methodology

The purpose of this chapter is to detail the methodological conduct of the empirical part of my study in an attempt to answer the following question: *What are some AI narratives found in contemporary Chinese science fiction?* I will introduce the research design and explain the qualitative, hermeneutic approach to interpreting narratives. After this, I will describe the data collection process and detail the hermeneutic close reading method I will use to analyze this data. In order to stay true to the inductive qualitative approach, throughout the process, my research has remained iterative, with the research question(s) and methodology evolving and developing "in dialogue with empirical data" (Stake, 1995/2000). This iterative approach allows for themes to emerge that were not initially included or anticipated in the research focus.

3.1. Research Design

The research objective of this thesis is to identify and contemplate themes and future images of Artificial Intelligence found in, arising from, and amplified by works of Chinese SF literature. Hence, in this empirical part of the research, I aim to (1) discover the AI narratives in Contemporary SF and (2) discuss the possible meanings and implications of the found imaginaries in AI narratives. Because of the embryonic nature of the research topic, I decided to act per the qualitative research tradition. This research tradition offers an opportunity to make sense of complex phenomena within their actual contexts (Miles and Huberman, 1994; Eriksson and Kovalainen, 2008). According to Spencer et al. (2014), the qualitative approach is generally acknowledged to be "particularly well-suited to addressing some of our most pressing issues and concerns," such as the future of AI in a global context.

Moreover, Miles and Huberman (1994) argue that qualitative data has "strong potential for revealing complexity" and is often endorsed as "the best strategy for discovery, exploring a new area." Through qualitative data, a researcher can capture the *how* and *why* of underlying phenomena (Miles and Huberman, 1994). Thus, the usage of the approach is appropriate in terms of fulfilling the objective of this research in gaining a better understanding of AI narratives in contemporary Chinese SF.

Methodologically, I (like other researchers in the field, e.g., Bareis and Katzenbach (2021)) situate this research within the hermeneutical tradition of the study of technological imaginations (Verschraegen *et al.*, 2017) as well as vision assessment (Grin and Grunwald, 2000), which stem from the larger STS community (overview by Konrad *et al.*, 2016). I employ this explorative analytical method by focusing on content and building from a pool of examples from Chinese SF. Through the selected examples, I investigate narratives, forms, and patterns in constructing future AI narratives (e.g., Lösch, Armin, and Meister, 2019; Roßmann, 2020).

I use an interpretative, hermeneutic analysis, which does not "stress objectivity and independence of interpretation in the formation of knowledge" but "enables you to elicit an in-depth understanding of the meaning of, for example, human practice, culture, works of art and texts" (KOPPA: JYU, 2010). As a philosophical approach, hermeneutic phenomenology is not constrained by structured stages of a method (Norlyk and Harder, 2010).

The Hermeneutic Research strategy is often used when the interpreter studies a text they have little knowledge of, nor are they completely familiar with the context from which it originates (Rautio, 2007). According to Rautio (2007), historically, in hermeneutics, the researcher attempted to personify the primary author and "simulate their context, history, and manner of thinking." There was an attempt to eliminate "wiped out" the researcher's values and experiences. Today researchers (Rautio, 2007; Neubauer et al., 2019) argue that reaching such targets is impossible and that it is more valuable if the researcher consciously recognizes their personal preferences and traditions from earlier research on the exact text. Thus, the researcher's task is not to become the original author but to act as a translator of the text at hand into contemporary culture. As argued by Rautio (2007), the goal in hermeneutics mimics that in any humanistic study: to gain a more in-depth understanding of the object without being fully aware of the text's origin or context. The key is the inspection of the object from alternating perspectives.

Alternation of perspectives is most commonly known as the *hermeneutic circle*, but I will use the hermeneutic spiral, as depicted by Rautio (2007), as it implies that while I will be repeating parts of the process, I will also access deeper layers. This process is continued until no more interesting findings arise through the shifting of angles. Rautio (2007) explains that if, due to lack of information, no other means of inspection are available, the researcher can always

choose to alternate between a *detailed* and *global* view of the object. He attests that these two alternating viewpoints are fruitful in almost any study. Juha Varto (1992 in Rautio, 2007) suggests the following procedure for hermeneutic interpretation:

- (1) The researcher needs to remember that what we are trying to build an understanding of is not our world – but somebody else's. Thus, "imposing meaning from the outside," like forcefully imposing Marxist or Freudian philosophies on an object, is not suitable for the object, nor does it contribute to further understanding of the object, even if this may produce a rich and exciting analysis.
- (2) The researcher should keep the meaning coherent. Picking detached features and combining them to create a new entirety is falsifying reality and should be avoided.
- (3) During the time of interpretation, the researcher is living their own life. Objective reading does not exist. The ability to attribute meaning to an object is only within a researcher's limits. "Every generation rewrites history," understanding objects in various ways over time.
- (4) The researcher should make a conscious effort to reflect on their means of interpretation. Building an understanding of one's own standing points will, at least to a certain extent, free the researcher from their subjugation.

Gadamer's (1976) version of hermeneutics is (according to Alsaigh and Coyne, 2021) based on two notions: (1) understanding is made likely because first of our preconceptions are fragments of personal linguistic experience, and (2) understanding is made conceivable through human consciousness – 'universality' and a 'fusion horizon' – which connects the people that express themselves to the people interpreting them (Morse, 1994). Gadamer saw hermeneutics as a means to shine a light on conditions in which experience, perception, knowledge, and

understanding occur instead of merely developing a means of understanding (Gadamer, 1976). The ontological view Gadamer held was that researchers' way of being in the world is a result of and deeply influenced by the traditions of their societies and culture (Converse, 2012). Because understanding is a state of 'being in the world,' interpretation relies much on tradition. According to Gadamer (1976), it is essential to respect other worldviews while staying true to our own experiences and perspectives.

The hermeneutic method is widely used in academic research (Alsaigh and Coyne, 2021, Austgard, 2012; De Sales, 2003; Koch, 1993), but it is essential to remember that using the method means your results are your interpretations of your starting point, and others may not share them. Thus, the validity of the results in the 'real' world remains unclear. To give a better view of my background and starting point, please read the forward of my thesis.

3.2. Data Collection

Roulston (2010) distinguishes between sampling and selection. The number of data or interviews being analyzed can be referred to as sampling, while selection is the act of deciding who or what the study should focus on (Brinkmann, 2013). As stated in the previous section, qualitative research aims to maximize the usefulness of information elicited from qualitative data (Flyvbjerg, 2006). Like Pettigrew (1988) suggests, due to the limited amount of cases that can usually be included and studied, it makes sense to select cases with intentionality, and as Flyvbjerg (2006) suggests doing this based on “expectations about their information content.” This selection process is known as purposeful sampling or judgment sampling, and it has been shown to allow the extension and replication of emergent theory (Pettigrew, 1988) or support the generalizability and transferability of research (Eisenhardt, 1989).

Within the scope of my thesis, I had already narrowed my selection of literature to contemporary (21st century) science fiction written by Chinese writers. I then read ten books, three of which were short story compilations. These books had been chosen based on the availability of English translation and mentions of these books on versatile media platforms (e.g., NY Times, China Daily, SCMP, and Goodreads.) After reviewing these books, I decided to explore Ken Liu's anthology, *Broken Stars* (2019), for three main reasons: (1) The collections exemplify works of versatile Chinese writers. Most of the authors, except for Liu Cixin, in *Broken Stars* are from a younger generation of up-and-coming SF writers instead of a generation of prominent authors. The newness offers novel ground for analysis (Liu, 2016/2019); (2) The works have been curated and collected from many unconventional sources, including social media platforms, literary journals, and gaming and fashion magazines. This expands "the range of voices included as well as the emotional palette and narrative styles" (Liu, 2019); (3) Liu has been praised by authors and gained multiple awards for his translations from Chinese to English (Alter, 2019) and has given priority to works which are "more accessible translation than works requiring a deeper understanding of Chinese culture and history" (Liu, 2019).

These biases and omissions are necessary within the scope of my research, but as Liu (2016) points out, this is not ideal. In the introduction, Liu (2016) warns: "the reader should thus be cautioned about conclusions they may draw from each story here at least adds a layer to the reader's understanding and awareness of literary traditions different from the one they might be used to, and I make no attempt at curating "best of" anthology, Given the diversity of stories that can be called "Chinese SF" and the heterogeneous makeup of the community of Chinese

SF writers, a project that aims to be comprehensive or representative is doomed to fail, and I am skeptical about most methods for picking the “best” stories.”

Broken Stars includes 16 stories from 14 authors. For further analysis, I chose two stories, *Goodnight, Melancholy* by Xia Jia and *The Robot Who Liked to Tell Tall Tales* by Fei Dao, due to their explicit and recognizable depiction of AI. I found ambiguity within this step of my process. I soon realized that I exemplified a natural bias (much like other researchers, see Hudson *et al.*, 2021) of identifying AI in *character* instead of *system*. I quickly included stories featuring talking computers or robots, particularly those with names or an emotional role within the narrative. I had difficulties deciding whether to incorporate stories that included systems of computation, making complex decisions but not conversing. Similarly, I found it difficult to decide whether to include narratives with elements running in the background, such as facial recognition and autonomous vehicles. In the end, I decided to stick with the original stories chosen while recognizing the ambiguity of my decision.

3.3. Data Analysis

Within the field of humanities, hermeneutic analysis is often based on a detailed analysis of the phenomenon to produce interpretations, and it can be done using various methods (KOPPA: JYU, 2010). Close reading is a broad category of explorative interpretation that provides a researcher the means to conduct a detailed analysis of the chosen phenomena. As a concept, 'close reading' is fundamental for literary interpretation (McClennen, 2001). The aim is to develop an in-depth understanding of a literary passage based on words. Nevertheless, beyond merely aiming to understand the text, close reading emphasizes the contextualization of more significant themes and ideas within the researched passage.

McClennen (2001) emphasizes the importance of distinguishing between doing a close reading and writing a close reading. Doing involves a process of moving from more minor details (such as words, sounds, and punctuation) to larger clusters (such as images and metaphors, and finally to most significant concepts (such as the theme). The aim is to dialogue with the text to gain understanding following hermeneutic analysis (Alsaigh, 2021). Once the researcher writes the close reading, they should begin with the larger concept and use these relevant details as evidence. The final argument should be based on smaller bits of information (McClennen, 2021).

Close reading does not have a specific sequence (KOPPA: JYU, 2010), and the researcher has the flexibility and responsibility to choose their stages according to the research question and object being interpreted. Ajjawi and Higgs (2007) applied hermeneutic phenomenology in their study. They described a framework with six stages of data analysis for the analysis of their data: (1) immersion, (2) understanding, (3) abstraction, (4) synthesis and theme development, (5) illumination and illustration of phenomena, and (6) integration and critique. Other researchers have also used these stages (e.g., Alsaigh and Coyne, 2021; Bynum *et al.*, 2019/2020; Obatusin *et al.*, 2019) due to them being "detailed, structured, [and] clear to follow ." I decided to follow their stages in my study as indicated:

Stage 1: Immersion

This is the stage in which I read the chosen texts. First, I read the texts through and annotated my initial thoughts. After this, I repeatedly reread the texts to get a better understanding of the texts as a whole. Gaining an overview of the entirety of the texts laid a foundation for my

analysis as it would impact the understanding of all other parts of the texts. I also found audio recordings of the texts on Clarkesworld magazine's website (<https://clarkesworldmagazine.com/>) and used these recordings as additional immersion alongside my reading. I annotated the texts extensively to identify significant sociotechnical features, as well as narratives of AI. Through the dialogue with the text, and the fusion of my horizon with the author's horizon, I attempted to decipher the meaning.

My pre-understanding through my literature review possibly built anticipation that might have influenced my initial encounter with the text. I tried to be mindful of any preconceptions I had. This step corresponds to Ajjawi's and Higgs's (2007) 'Preliminary interpretation of texts to facilitate coding.'

Stage 2: Understanding

I achieved a rich and more detailed understanding of the texts at this stage. I searched for repetition, contradiction, and similarities within passages and checked the meaning of every unfamiliar word I encountered. I investigated every section and sentence to understand and identify first-order constructs. These constructs represent the horizon of the authors' ideas captured by precise detail through words and phrases and refer to the original narratives of the texts.

Stage 3: Abstraction

In this stage, I manually identified second-order 'research constructs,' or descriptive sub- and core categories, abstracted and integrated from the data pool of first-order constructs I already

have. Afterward, I performed a thematic analysis to uncover underlying data's underlying themes (Braun and Clarke, 2006). Sub- and core categories were manually grouped into subthemes, built upon my personal and theoretical knowledge, and represented my horizon. Through a *conversation* with categories, it is possible to construct 'low-level theory' "that evolves from the study of a phenomenon in a particular situational context and applies to immediate and specific situations" (Shkedi, 2004).

Stage 4: Synthesis and Theme Development

In this stage, I initiated synthesis and theme development by grouping sub-themes. Subsequently, I related these themes to the whole meaning of the entire text in the act of aggregation. This is the essence of the hermeneutic circle (Alsaigh and Coyne, 2021). Through detailed analysis, I assumed that the meaning of parts would deepen and widen. Through challenging themes, my pre-understanding was also put under scrutiny. This stage was followed by the illumination and illustration of the phenomena phase.

Stage 5: Illumination and Illustration of Phenomena

In this stage, I tied findings from my literature review to the themes reconstructing the texts on an interrelationship basis. I formed possible sociotechnical imaginaries regarding AI to highlight key findings and illuminate the phenomena (Ajjawi and Higgs, 2007). This stage resulted in the creation of my findings chapter (chapter 4) of the thesis and completed the hermeneutic circle.

Stage 6: Integration and Critique

The final stage concentrates on integration and critique. This stage is illuminated in the discussion chapter of my thesis, in which I critique my themes and report final interpretations of my research findings as they currently stand.

As hermeneutic phenomenology is not a fixed methodology, there is a high risk of using it poorly. Particularly novice researchers, such as myself, struggle with applying hermeneutic analysis (Crowther et al., 2017; McCaffrey et al., 2012). The critical challenge is to know how to 'be and stay open' (Suddick et al., 2020). Thus, Denzin and Lincoln (1998) suggest that reflexivity is essential to amplifying qualitative research studies' credibility, trustworthiness, and integrity. Reflexivity is the act of questioning attitudes, thoughts, habitual actions, and reactions of oneself to form an understanding of how we relate to the other (Bolton, 2018). According to Dowling and Cooney (2012), self-awareness involves an inquisition into our positionality in age, life experience, role, personality, ethnicity, and social identity.

As a novice researcher, the practice of reflexivity had its challenges, and to facilitate my reflexivity, I used Valandra's (2012) guidelines for professional use of self in research. Valandra (2012) outlines some questions to help reflexivity at each phase of the research process. During the pre-research phase, reflexivity involved facing my limitations and biases, the knowledge – as well as the lack of it – on the topic of research, and the risk of my experiences and perspectives coloring my research findings. Some pre-research questions I used from Valandra (2012) included:

- (1) What do I already know about this topic?
- (2) How do I know what I know?

- (3) How have my personal and professional experiences shaped what I know?
- (4) What assumptions, biases, attitudes, and beliefs shape my construction of this idea?
- (5) What am I passionate about regarding this topic/idea?
- (6) How are my life experiences shaping the design of this study?

I engaged in a dialogue with myself to answer these questions and pinpoint the relation I have to the object of study. I wrote a preface to answer these questions to convey my stance and set the tone for my study. During the analysis and writing up of my study, I made extensive notes and annotations throughout each step of the process. Questions that I considered from Valandra (2012) included:

- (1) What stories are represented?
- (2) Whose voices are missing
- (3) What are the similarities?
- (4) What are the differences?
- (5) In what way does my background influence my reading?
- (6) In what way am I invested in the study's findings?

4. Findings

In this chapter, I will analyze two stories, *The Robot to Who Likes to Tell Tall Tales* by Fei Dao and *Goodnight, Melancholy* by Xia Jia, to exemplify sociotechnical imaginaries of AI in Chinese SF. I will end the chapter by exploring the similarities of these imaginaries.

4.1. *The Robot Who Liked to Tell Tall Tales*: Sociotechnical Imaginary of Unexplainable AI

The Robot Who Liked to Tell Tall Tales (2017) is a novelette by Jia Liyuan (贾立元) under the penname Fei Dao¹¹ (飞氲). The work was initially published in 2014 in Chinese (爱吹牛的机) and later translated into English in 2017 by Ken Liu. *The Robot Who Liked to Tell Tall Tales* is an SF possibly inspired by Stanisław Lem's *The Cyberiad* as it mixes kings and robots in its storyline (Stewart, 2019), which creates an evocative subgenre of magical realism or fablesque SF. Calvinesque in nature, *The Robot Who Liked to Tell Tall Tales* builds more on theme and variation instead of a coherent narrative (Shivani, 2008). It is a story of a machine on a mission to become the greatest fabler in the Kingdom in an attempt to fulfill an order given by the King. Through his work, Fei Dao discusses natural language processing, the black box, immortality, human-computer interaction, and the importance of storytelling while painting a vision of AI that has become unexplainable to humankind.

The novelette begins in a world unified by a King who is "brave and clever and blessed with good luck," and "most remarkably, he did everything aboveboard and never lied." Sadly, the heir to the throne does not resemble his father and is known by the people as a compulsive liar, and the Kingdom changes as he steps onto the throne.

It was said that as the King lay dying, the young man, bless his heart, did not say anything outrageous. Tenderly, as he gazed at the old man, he declared, "Dear Father, don't worry. In your stead, I will conquer something even more terrifying than the sun."

And so the "Bullshit King" ascended to the throne, and the people's lives descended into depravity.

Annoyed by the gained reputation of being the greatest fabler of the Kingdom, the new King decides to draw attention away from himself by employing one of the Robot servants with the task to become an even better storyteller than himself.

The old King had built an army of robots. These machine soldiers, fearless and dependable, had done great service for the throne and pledged perpetual fealty to each successive King. After careful screening by scientists, one particular robot soldier was brought to the palace.

"Listen carefully," the King ordered.

The Robot strained to capture every buzz and hum in the air. It was unable to decode any useful information.

"Anyway, this is why I need you. I want you to leave behind the honesty that you obtained from my father. I want you to lie shamelessly, to exaggerate unabashedly, to fabricate castles in the air without remorse. You must become the teller of the tallest tales, an unprecedented master of bullshit. This is how I will be saved, and how you will achieve absolute freedom."

And that was how the Robot got his mission.

In the future, created by Fei Dao, AI has developed into being highly capable of machine learning. The Robot can emulate human-like learning and think using fuzzy logic instead of strict logic. Mimicking the human brain is done through neural networks, a type of algorithm designed to learn a mathematical function that works by recognizing underlying relationships in a set of data (Krose and Smagt, 2011). The Robot of the story begins traveling the world and

engaging with humans in an attempt to be able to tell better stories. Instead of following strict rules on how to proceed, the King only specifies the desired outcome. The Robot attempts to fulfill the mission by progressively improving by comparing examples, trying to approximate these examples, and becoming better at the task over time.

Fictioneering was a skill that could not be taught in a classroom, and the mechanical soldier had to go seek knowledge in the world. It left the palace and wandered the earth, gathering wisdom, gaining experience, associating itself with a variety of absurd acts, nurturing its soul in the company of delirious souls, feeding on the diseased ravings of lunatics, learning to tell breathtaking lies, spreading the seeds of chaos—until it also gained a measure of notoriety.

Much of the machine learning technology exemplified by Fei Dao's Robot already exists in some form. Google, Baidu, and Open AI have AI programs that use a highly complex form of math based on linear algebra. These organizations have training data inputted to teach the machine against this data and see it improve over time. In the case of the previously mentioned organizations, this training data is the text on the internet, while for the Robot in the story, the Universe is the training data. Trained on the data, AI begins to understand and form a converged view of human language and communication. The AI learns to identify what and how to reply to when a specific thing is said or when the emotional loading of a conversation is of a certain temperament. (Rogan, 2022)

Eventually, these approximations become highly complex to the point where humans lose track of how the AI system works and how it improves itself. In the novelette, the reader becomes unsure whether the stories told by the Robot are true or not, and the Robot manages to anger a group of men at a bar, as well as death himself. Furthermore, in an attempt to become an even better fabler, the Robot joins a spaceship crew and falls into a black hole. After the Robot falls

into the black hole, Fei Dao's story becomes fantastical and unbelievable, pulling the reader into a confusing world that makes little sense in reality. This possibly symbolizes the AI "black box."

It turned out to be an actual black hole! The black hole was filled with secrets: more than five moles of secrets gathered from members of nine trillion species spread over a million galaxies, secrets that the tellers felt compelled to share but were also terrified of sharing. Wow! What an experience! I climbed back out and wanted to discuss these secrets seriously, but everyone treated my stories as made-up tales.

Modern machine-learning models, including neural networks, are called "black boxes." This term comes from precisely the fact that humans lose track of the decision-making and learning process of the AI system. Lately, many attempts have been made to improve the explainability of AI as there is an increased need to understand AI as societies increasingly turn to it for answers. Different explanation methods attempt to give descriptions of individual model decisions, yet Castelvechi (2016) suggests that these explanation models are of little use if the average person cannot easily make sense of them or even misunderstands them. Efforts for creating transparent AI have become more prevalent than ever, as many studies show that possibly the biggest mistrust in AI is due to not understanding it (Durán and Jongma, 2021).

Humans cannot assess how a black box algorithm arrives at a particular answer. However, even though it might be difficult for humans to assess how a black box algorithm arrives at its answers, they can provide value through results that humans would have been incapable of arriving at alone; the cost of wrong answers is relatively low when the answer inspires new ideas (Gulshan et al., 2016). Such is the case in *The Robot Who Liked to Tell Tall Tales*, as the Robot protagonist manages to help many of the people he crosses paths with find answers to questions they would have been unable to answer alone. Fei Dao's Robot can even answer more

profound philosophical questions regarding death. In our current world, although biased, limited, and at times categorically wrong, AI has outperformed humans in many tasks such as medical diagnostics (Gulshan et al., 2016).

The Robot, having experienced and seen so much of the world, was now able to think deeper.

The people of China have been less vocal than the west in displaying worries regarding the black box. This could possibly be due to the citizens of the nation being more comfortable with centralized decision-making (Gao and Zhang, 2021). In many ways, the Chinese government could be comparable to the black box of AI, where the decision of how to go about solving a problem is handed to the government, and it is generally trusted that the government has more knowledge to do its best to provide the best possible collective solution. However, it is essential to note that the trust of Chinese people in their government is often overrated and much debated (Li, 2021). Nevertheless, China seems to top the charts regarding citizens' trust in AI (Ipsos, 2022). Just as in Fei Dao's novelette, there is an underpinning belief in the loyalty of the machine toward humans. In Fei Dao's narrative, the Robot goes above and beyond, even escaping death, to complete the task it had been given.

"Oh . . ." His eyes squinted against the bright firelight. "I guess you really are determined. Why do you want to go home so much? Nowhere else will give you the eternal peace that you can find here."

"I'll never give up even if there's only a single ray of hope."

- -

"Excellent. Then let me ask you: do you believe you can carry out your duty? If you return home, will you truly qualify as the unprecedented, peerless, one-and-only, unparalleled, unsurpassed, irreplaceable, unreproducible, history-defying, future-mocking master of bullshit?"

As the Robot promised, it invoked 256 different verification routines and carried out 97,466,000,000,000,000 calculations. After exhausting nearly every ounce of energy, it answered, "Yes, Your Majesty."

The Robot Who Liked to Tell Tall Tales ends with an unexpected and somewhat confusing twist, as the Robot, returning from its mission, takes the form of the "Bullshit King" from when he was still a child. Apparently, the King had fallen into a hole in the woods when he was still a prince, and after that, he had begun telling fabricated stories. However, merging the Robot with the human seems like a leap in the narrative. Fei Dao seems to want to provide his take on what it means to be human in the age of AI and the complex, intertwined relationship we have with machines.

A computer plays back what people say to it. Also, the Robot of the story lacks a certain level of consciousness as all it does is rearrange and repeat ideas it has seen or heard from others. The computer has no personal values. Nevertheless, there is an argument to be made that humans do precisely the same – that original thinking does not exist and that our intelligence is not much different from that of our artificial counterparts. In the future, machines may take over work we thought of solely human, such as storytelling and art. Most content found on the internet may be AI generated, such as the works of a system called DALL-E (Rogan, 2022). DALL-E uses phrases and words to create original pieces of art.

In many ways trusting an intelligent system has become more complicated than ever as distinguishing between humans and AI has become, at times, almost impossible. However, Pierre Baldi, a researcher of machine learning from the University of California, argues that we trust and use our brains all the time even though we have no clue how they work (Castelvecchi, 2016).

The adults always think they're so wise and they know everything. They'd never take a kid's words seriously. They'll say I made it all up . . . But who cares! Someday they'll know I'm telling the truth.

Well, it doesn't matter if they call me a liar. As long as they enjoy my tales and laugh heartily, I'll help them.

11. Fei Dao (1983, Chifeng) is the executive director for Tsinghua's Center for Literary Writing and Research, a scholar, and a prominent SF writer. He completed his bachelor's degree in Environmental Engineering but transferred to literature studies and obtained his Ph.D. in Literature from Tsinghua University. After this, Fei Dao engaged in further research at the Beijing Normal University before returning to his alma mater. He has authored several SF collections of short stories, including works such as *Innocence and Its Fabrications* and *The Long Journey to Death*. In addition, under his real name, Jia Liyuan, he has published several academic articles in journals such as *Science Fiction Studies* and *Literary Review*. (Liu, 2015)

Fei Dao is known for stories that blur the lines between fantasy and SF and futurism and history. He has been called "a brilliant SF poet" by Liu Cixin, arguably China's most famous SF writer, and is known for his daydream-like journeys of the imagination. Fei Dao is also a prominent figure in promoting and defending the importance of SF in China and has stated that SF "has a serious mission to enlighten, spread scientific knowledge and reshape culture." (News China, 2022)

4.2. *Goodnight, Melancholy*: Sociotechnical Imaginary of the Emotionally Intelligent AI

Goodnight, Melancholy (晚安，忧郁, 2015) is a short story written by Wang Yao (王瑶) under the pen name of Xia Jia12 (夏笳) and is a back-and-forth between a narrative of a depressed Chinese academic from the future and a narrative of the "father of modern computing," Alan

Turing, from the past. The first narrative plane is a fictional depiction of the near future with a heavy emphasis on emotionality. In contrast, the second narrative plane is more in the style of creative, documentary-like non-fiction that attempts to lay a historical foundation and introduce technological ideas to the story's future. Combined, these two parallel narratives explore what it means to be human in the age of artificial intelligence, the concept of digital solitude, and the limitations and possibilities of AI as emotional support. Central is the idea of the blurred line between AI and humans – is AI separate from us or an extension of us?

Inspired by the rise of chatbots being used for depression and anxiety treatment, in her short story, Xia Jia narrates a sociotechnical imaginary of a future in which AI has, in many ways, become more human than humankind itself, and humanity seems to have built closer connections to their AI counterparts than to each other. In her work, Xia Jia also uses language, emotion, and imagery to raise the question of the significance and the changing meaning of loneliness in a world where AI is the primary subject of our interactions and to make the reader contemplate whether or not this is a future worth striving for.

In the first narrative plane, we are introduced to Lindy, a stuffed rabbit toy equipped with advanced AI technology to help a depressed academic, an anonymous female protagonist, and to Nocko, another helper AI who takes the form of a baby seal. The story begins with Lindy arriving at the narrator's home.

"I remember the first time Lindy walked into my home. She lifted her tiny feet and set them down gingerly on the smooth, polished wooden floor, like a child venturing onto freshly-fallen snow: trembling, hesitating, afraid to dirty the pure white blanket, terrified of sinking into and disappearing beneath the featureless fluff."

I held her hand. Her soft body was stuffed with cotton and the stitches, my own handiwork, weren't very neat. I had also made her a scarlet felt cape, like the ones in the fairy tales I had read as a child. Her two ears were of different lengths, and the longer one drooped, as though dejected."

From the beginning, it is clear that feelings and emotions play a crucial role in how AI is depicted in this short story. Instead of choosing a rigid, robotic outer shell for her autonomous characters, the AIs in Xia Jia's narrative takes the form of plush toys and baby animals, with the explanation that, had the AI been "made to resemble a human baby, the uncanny valley would have filled viewers with dread at [the] smooth, synthetic body ." The uncanny valley hypothesis was proposed by Mori (1970/2005) and referred to a nonlinear relation between a robot's resemblance to a human and its likability. In other words, the hypothesis argues that humans prefer anthropomorphized agents but reject them once the resemblance becomes too similar. According to Wang et al. (2015), findings are inconsistent as to whether or not this phenomenon exists, but they believe there is a growing "need to understand the nature and boundary conditions of the uncanny phenomenon ." However, interestingly it does seem like our tolerance is shifting. It has also been shown that individuals with a higher neuroticism personality trait, who are also more likely to get depressed, have a lower tolerance for human-like robots (MacDorman and Entezari, 2014). Then again, people on the autism spectrum tend to have fewer problems accepting extremely humane androids (Feng et al., 2018).

Personalized and individualized AI has been making its way in recent years. Recently a research group at Harvard, along with Deep Longevity, has developed AI to identify future well-being and offer personalized advice (Galkin et al., 2022). According to Zhavoronkov, a research team member, "existing mental health applications offer generic advice that applies to everyone yet fits no one. We have built a system that is scientifically sound and offers

superior personalization". This stands true in *Goodnight, Melancholy*, in which future AI is highly personalized and individualized. What is remarkable about the portrayal of Lindy is not just how she does not resemble the typical image we have of computers, cyborgs, or robots, but how her existence is tied to the protagonist. While Lindy may not look human-like, she has taken her form from the protagonist's childhood memories of a drawing.

"The teacher then said that the boy was nicely drawn, but the rabbit needed work—although now that you've thought about it, perhaps what he actually said was "the rabbit's proportions are a bit off." But the truth is impossible to ascertain. Since you were convinced that the teacher didn't like the rabbit, you erased it, though you had drawn the rabbit in the first place to keep the boy company so that he wouldn't feel so alone in the universe."

The adoption rate of personalized AI companions is still unknown. As Lee (2021) pointed out, children have been shown to anthropomorphize toys, pets, and even imaginary friends easily. Thus we could imagine children being the first target group of AI companions. Especially in China, where education is viewed highly, EdTech is the first to begin designing AI companions for skill learning (Hao, 2019). Lee (2021) points out that children's development would be drastically improved through technology with the ability to speak, hear and understand. However, it is not only children that AI companions are slowly targeting. AI companions are also believed to change elderly care, especially in countries such as China, where population aging is accelerating, and new caretaking methods must be developed (Zhou, 2019).

The barrier to using robot helpers in Asian countries seems to be lower than in the West, and they are already commonly used in countries such as Japan, South Korea, and China (Thornhill, 2018). While in the West, we tend to form a sociotechnical imaginary in which robots take our jobs, the view in Asia is different. Asian Development Bank (2018) reported that "robots are

creating rather than destroying jobs . "This is also depicted in *Goodnight, Melancholy*, where AI has not increased joblessness as the reader is taken to a park during the day, and only the elderly and young are there accompanied by their AI helpers, as most of the adult population is at work.

Asian children growing up with more positive views of robots seem to have an easier time accepting AI into their lives and building trust towards these technologies (Thornhill, 2018).

Your therapist tells you that you should treat this self that you despise as a child, and learn how to accept her, to live with her, to love her. When you hear this, the image of that caped rabbit emerges in your mind: one ear longer than the other, drooping with sorrow. Your therapist tells you: Just try it. Try to hold her hand; try to lead her over the abyss; try to push away your suspicions and rebuild trust. This is a long and difficult process. A human being isn't a machine, and there's no switch to flip to go from "doubt" to "trust"; "unhappy" to "happy"; "loathe" to "love."

You must teach her to trust you, which is the same as trusting yourself.

Lindy's two eyes slowly roamed, as though searching for a spot to focus on. I couldn't decipher her expression. I forced myself to relax, holding her two little hands in mine. Don't be afraid, Lindy. Let's trust each other.

According to Masatoshi Ishikawa, a robotics professor at the University of Tokyo, another explanation why Asian cultures seem more comfortable with anthropomorphizing and trusting robots is due to different belief systems (Thornhill, 2018). Whereas Monotheistic religions struggle with acknowledging intelligence within a non-organic body, eastern spiritualist religions have more ease crediting a separate soul in robots. The spirit or soul is also brought up in *Goodnight, Melancholy* to contrast humans and non-humans.

"Lindy, do you know why you're unhappy?" I said. "It's because you think too much. Consider these wild seeds. They have souls also, but they don't think at all. All they care about is dancing with their companions in joy. They couldn't care less where they're blown by the wind."

Blaise Pascal said, "Man is only a reed, the weakest in nature, but he is a thinking reed." However, if reeds could think, what a terrifying existence that would be. A strong wind would fell all the reeds. If they were to worry about such a fate, how would they be able to dance?

Lindy said nothing.

It is left unclear where AI is comparable to the human or reed in this passage and it is left for the reader to decide, but it is exactly the notion of "spirit" that makes the AI in Xia Jia's novel almost more human than the protagonist. Throughout the text Lindy and Nocko are described through language usually attributed to humans. Xia Jia uses phrases and words such as *"like a child," "soft body," "resemble a human baby," "held her hand,"* and *"dark, lively eyes"* to emphasize the humane of AI. While, in contrast, for humans, phrases and sentences such as *"turned into a cave human," "caged beast," "less like a living person and more like a machine, laid out on a workbench to be examined,"* and *"I'm like a broken wind-up machine that has been stranded, with hope ever receding. I'm tired. I want it all to end"* are used. This type of narration feeds into the AI narrative of a certain degree of dehumanization and dependence lock-in, where individual cognitive, social, and survival skills are reduced.

However, Goodnight, Melancholy does not state whether dependence on AI is solely negative. The human race is already dependent on many technologies today, and the short story takes it a step further by depicting a society where the lines between AI and the human counterpart become so blurred that, at times, it is hard to distinguish between the needs of AI and humans. This is exemplified through a passage where the protagonist is told to take Lindy outside. After

all, she needs sunlight because "her eyes were equipped with photoreceptors that precisely measure the daily dose of ultraviolet radiation she receives" and needed this for recuperation. While the protagonist does not feel too excited about this at first, she tells herself: "It was no big deal; just a stroll outside. We'd be back in an hour. Lindy needed sunlight, and I needed fresh air".

While it might seem that AI and human identities have become intertwined in Goodnight, Melancholy, there is a clear distinction between AI and humans. In Xia Jia's future, humans are very knowledgeable of their AI helpers and understand the underlying computation behind the robots.

"I knew that this was a display intended to attract my affection and attention. These complicated, pre-formulated behaviors were modeled on young children, but they were key to the success of language-learning robots. Without such interactive behavior feedback, Nocko would be like a child on the autistic spectrum who cannot communicate meaningfully with others despite mastering a whole grammar and vocabulary."

"Even Nocko and Lindy could be left by themselves because in the end, they were just machines, incapable of dying from lack of care. Perhaps algorithms could be designed to allow them to imitate the emotional displays of being neglected, so that they would become moody and refuse to interact with me. But it would always be possible to reset the machine, erase the unpleasant memories. For machines, time did not exist. Everything consisted of retrieval and storage in space, and arbitrarily altering the order of operations did not matter."

So clearly, although seemingly highly emotionally intelligent, AI is still distinguishable from humans in the short story. The reader is left wondering whether Lindy has reached general artificial intelligence (GAI) or not. This question is explored in the parallel narrative plane, in

which Alan Turing spends the remains of his days pondering philosophical questions and personal matters with his invention, a conversational AI program, Christopher. The strand also feeds into the story by exploring how we could build AI with the ability to relate to people. The strand also serves an interesting purpose of teaching several concepts, such as the Turing test and intelligence. Xia Jia deliberately weaves actual events from Alan Turing's life with fictional inventions and challenges the reader by breaking the fourth wall.

The Turing test, initially called the imitation game, is a conversation-based test that examines whether or not AI exhibits human-level intelligence (Moor, 2003; Copeland et al., 2017). AI passes the test if the human member does not know that or cannot tell if the other member is an AI or not. The test has various objections (Graham and Dowe, 2021), with some researchers finding it too difficult (e.g., French, 1990), some too narrow (e.g., Gunderson, 1964), and others think it is not demanding enough (e.g., Harnad, 1989). According to Lee (2021), for AI to reach the level of human intelligence, some researchers believe in a need for a greater understanding of the human brain and consciousness; others instead advocate for neuromorphic engineering, and some even call for elements of classical computing, rule-based expert systems. Lee (2021) believes that the best way to increase the intelligence of machines is through computing power and data.

In *Goodnight, Melancholy*, the intelligence of machines seems somewhat secondary. Turing questions whether we should expect machines to think like us, and he seems to believe that computers think differently from humans. It is almost implied that it is anthropocentric and even narcissistic to believe that human intelligence is the supreme form of consciousness.

Turing always believed that there was no reason for machines to think the same way as humans, just as individual humans thought differently from each other. Some people

were born blind; some could speak but could not read or write; some could not interpret the facial expressions of others; some spent their entire lives incapable of knowing what it meant to love another; but all of them deserved our respect and understanding. It was pointless to find fault with machines by starting with the premise that humans were supreme. It was more important to clarify, through the imitation game, how humans accomplished their complex cognitive tasks.

In Xia Jia's future, AI is regarded as a separate form of intelligence that operates differently from humans, adding value to society through its complementary skills. The primary purpose of AI seems to be to offer services and companionship. Although compared to Lindy, who is sophisticated and emphasizes non-verbal communication, Turing's Christopher from the past is much less developed; he is also built to offer connection. While Christopher's flaws are painstakingly obvious, Turing is adamant about talking to him as a form of therapy.

Alan: Such a beautiful poem. I love you.

Christopher: Thank you, Alan.

Alan: That's not the right response.

Christopher: Not the right response?

Alan: When I say "I love you," you should respond with "I love you, too."

Christopher: I'm sorry, Alan. I'm afraid I don't understand.

At its core, *Goodnight, Melancholy* raises awareness of the persistent need for love, affection, and companionship that we humans have despite all the technological changes happening around us. Turing's AI Christopher and the protagonist's AI Lindy represent this human desire to be noticed and heard. Loneliness is on the rise worldwide, with social media being attributed to this rise (Bonsaken *et al.*, 2021), and recent studies (Lapraki *et al.*, 2022) suggest that COVID-19 has made the problem even more prevalent. China is no exception to this. Factors

such as fast-paced urbanization, the one-child policy, and extreme lockdown measures have contributed to loneliness in the country (Luo, 2014; Zhao, 2022; Yang and Victor, 2008).

It is hard to predict whether another pandemic will hit us, but the world's nations will indeed be taking steps to be prepared. Lee (2021) predicts that health care will be one of the industries most heavily transformed by computers and machines. COVID-19 has accelerated digitalization and the speed at which we have collected data, making it ever more possible for AI through sequence transduction, an elegant novel approach for self-supervised learning, to provide personalized healthcare and companionship to humans.

In her short story, Xia Jia offers and feeds into a sociotechnical imaginary of the emotionally intelligent AI that tends to our mental health and need for companionship in the future. However, interestingly *Goodnight, Melancholy* does not take a stance on whether such a future is desirable. Even if the reader is provoked into contemplating what it would mean to live in digital solitude, the story seems to end positively for both characters. Lindy can cure the narrator, and the narrator wishes she does not have to see Lindy for a while again, although she admits that she might miss her from time to time. Also, in the parallel narrative, Christopher learns to say "I love you" to Turing.

Alan: You know already, too, don't you? I want a steam engine, the kind that I wanted as a child but never had enough pocket money to buy. I told you about it. Don't you remember?

Christopher: Yes, Alan.

Alan: Will you give me a steam engine?

Christopher: Yes, Alan.

Alan: That's wonderful, Christopher. I love you.

Christopher: I love you, too, Alan.

11. Xia Jia (1984, Xi'an) is a painter, actress, filmmaker, scholar, painter and SF author (Liu, 2015). She began her undergraduate studies in physics at Peking University. She published her first short story, "The Demon-Enslaving Flask" in 200, and the story won her a Yinhe (Galaxy) Award for Best New Writer. The story was also published in Science Fiction World, sparking a debate on the blurred boundaries of SF and other genres in China. She then began studying Film and comparative literature in graduate school and ended up doing a Ph.D. with a dissertation titled "Fear and Hope in the Age of Globalization: Contemporary Chinese Science Fiction and Its Cultural Politics (1991–2012)". "A Hundred Ghosts Parade Tonight" (2012) was her first English published work.

In a male-dominant field of SF, her writings are often criticized for not being "hard" enough for the genre due to how emotionally loaded her works are. Her work is known for building tension between rationality and intuition, tradition and modernity, nodality and periphery, the spoken and unspoken. Today she is a multiple winner of the Xingyun (Nebula) and Yinhe (Galaxy) Awards for Chinese SF, and she currently lectures at Xi'an Jiaotong University, where she holds classes in Chinese Literature. In a male-dominant field of SF, her writings are often criticized for not being "hard" enough for the genre due to how emotionally loaded her works are. (Liu, 2015)

4.3. Common AI Narratives

Although Xia Jia's *Goodnight, Melancholy* and Fei Dao's *The Robot Who Liked to Tell Tall Tales* are different in style, one emotionally loaded while the other fable-like, I define three commonalities in the AI Narratives found in both works; (1) AI will increasingly be able to learn on its own through interaction with the world without the need of our help, (2) AI will be capable of outperforming us in certain specified tasks, even those requiring emotional intelligence and creativity, such as storytelling, and (3) AI will be loyal to, and also inseparable from, us, humans.

AI will increasingly be able to learn independently through interaction with the world. In *Goodnight, Melancholy*, Lindy learns by paying attention to her patient. In *The Robot Who Liked to Tell Tall Tales*, the Robot travels the universe alone to become more knowledgeable. Both works seem to be aware that AI training does not happen overnight. Lindy only begins to

talk towards the end of the story, and Alan finally learns to say “I love you” after first failing, while the Robot only learns to tell the best fables after years of data collection.

Both narratives exemplify how AI has outperformed humans in tasks once thought of as solely human. Even today, AI arguably outperforms us in many tasks of a particular function, but most of these tasks tend to be tasks that do not require creativity or emotional intelligence. However, in the short stories, AI has learned to simulate and understand human emotions and desires. In *Goodnight, Melancholy*, Lindy has taken the role of a therapist, while in *The Robot Who Liked to Tell Tall Tales*, the Robot has become a storyteller, better than a human. Interestingly, there is currently an ongoing project in the Chinese Science Fiction scene where SF writers, including Fei Dao and Xia Jia, have teamed up with AI to produce SF (Berggruen Research Center, 2020).

This project is an excellent example of how AI will be loyal to but also inseparable from humans. In *Goodnight, Melancholy* and *The Robot Who Liked to Tell Tall Tales*, there is a sense that AI is there to help us fulfill our tasks and amplify our abilities. AI has become a crucial part of the daily life of humanity in the future. At times it is hard to distinguish the difference between the AI and humans in the stories, but both narratives distinguish how the “soul” of the AI comes mostly from machine learning algorithms. The AI:s feel so humane because people perceive them that way, instead of the AI actually being human. The amplification of the algorithm behind the AI brings credibility to the sociotechnical imaginaries being created. However, rather than just focusing on whether the AI is human or not, both authors find it more important to explore how the penetration of AI into human life creates contradictions and conflicts in morality, emotions, and ethics.

Although both stories play into a gratification narrative of AI, a narrative in which AI and robots have become "an essential element in the relational sphere, satisfying every possible human desire" (Cave and Dihal, 2019), I would hesitate to categorize the narratives as solely utopian. Both short stories display a world that has evolved but is not easily categorized as either utopia or dystopia. According to Song (2013), these two may be the same in a new wave of Chinese SF. In *Goodnight, Melancholy* AI is used to treat loneliness and depression, yet people seem to struggle with mental health more than ever, and in *The Robot Who Liked to Tell Tall Tales*, the Robot is capable of being more creative than the human and producing entertainment, yet it will try to fulfill its mission no matter how it does it and whether the request is unreasonable or not.

I believe that the most powerful narrative of AI in both stories is the narrative of hope and human autonomy to make decisions regarding our future with this new form of intelligence. Both works call for the reader to explore and interact with sociotechnical imaginaries. Xia Jia breaks the fourth wall and invites the reader into a Turing test of her own, as the reader has to try to decipher whether or not the detail of Turing's life are facts or fiction, while Fei Dao changes his writing style from plausible to absurd, as the reader enters a figurative "black box." Rather than forcing a narrative onto the reader, both writers attempt to softly open a conversation regarding the future we want to create while emphasizing how change is inevitable, and thus these are ideas worth contemplating.

5. Discussion

5.1. Summary of Findings

Previous research has established that in a globalized world, how China imagines the future and how Chinese people view the relationship between science and technology, culture, and society, has a unprecedented effect on how AI that will be built and thus the direction and organization of the world's future (Chen, 2019). To achieve true global benefits of AI, better international cooperation in governance and ethical guidelines are required, whilst allowing for divergent cultural priorities and perspectives (ÓhÉigearthaigh *et al.*, 2020). Mistrust has been found to be one of the greatest barriers of cooperation and mistrust is likely fueled by misunderstanding of intentions and culture of another region (Ibid.).

The objective of this study was to attempt to build understanding of sociotechnical imaginaries of AI in China and to identify whether SF is a useful tool for this pursuit. Through this objective I wished to add to the academic literature aiming to build understanding and trust between nations as well as improve global co-operation and co-creation.

I situated my study within the realm of Science, Technology and Society (STS) research and more accurately the research of sociotechnical imaginaries, which are defined as “collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of advances in science and technology” (Jasanoff, 2015). Sociotechnical imaginaries have shown to be particularly useful when attempting to communicate desirable and attainable visions of the future as they act in the intersection between science and society as well as organizations and citizens (Harvard STS Research Platform). One possible, but not widely used, tool to study sociotechnical imaginaries, can be found within the study of science fiction (Jasanoff, 2015) and I decided to make sense of whether it was a beneficial tool to be used in the context of China.

I began by addressing the first research question of “*Can Science Fiction be a useful tool to understand Current Chinese sociotechnical imaginaries of Artificial Intelligence?*”. This was done through a thorough literature review both on sociotechnical imaginaries and science fiction. I arrived at the conclusion that SF is a possible tool for exploring sociotechnical imaginaries of AI in China. I argue that the benefits of using SF to explore sociotechnical imaginaries primarily come down to two factors: (1) The rising popularity of Chinese SF, not only in China, but also globally. While scientific research and policy might often be difficult for average citizens to understand, SF is easily comprehensible for everyone and thus has an effect on how people in the present view the future. The more people exposed to a certain imaginary, the more persistent and relevant this imaginary become; (2) Chinese SF provides alternative source material for building understanding of Chinese sociotechnical imaginaries due to SF’s fable-like nature, making the genre go more under the radar when it comes to censorship.

After my attempt to answer the first research question, I then explored current AI narratives in two works of contemporary Chinese SF literature, addressing my second research question: *What are some AI narratives found in The Robot Who Liked to Tell Tall Tales* by Fei Dao and *Goodnight, Melancholy* by Xia Jia? I was surprised by the hope in both works as well as how globally applicable, as well as relatable, both narratives were. I argue that the common sociotechnical imaginary of AI was one that has surpassed humans in many tasks once thought of as human, yet that AI was loyal to humanity and would do everything to fulfil our requests. I believe that both works emphasized human agency and the need for a conversation on the common global future.

5.2. Contributions to Science and Society

My thesis contributes to the current societal discourse on the future of humanity and AI by validating SF as a foundation and inspirational tool for building and exploring possible futures. In addition, my thesis provides preliminary evidence that SF could also be a valuable tool for understanding the relationship between technology and humans in the context of China. I believe that these contributions can help organizations lead conversations and make better decisions on matters regarding AI and China. I also believe that my study contributes to STS and China-related research through its multidisciplinary and novel approach.

In accordance with Bell *et al.* (2013) and others (Huntington, 1975; Stableford, 1979; Menadue and Cheer, 2017), I found that SF in China can be viewed as a unique platform for social commentary. However, it is essential to understand that the use of SF for research is by no means unbiased, and it carries with it more limitations than many other tools used for the study of sociotechnical imaginaries. Nevertheless, in line with findings from Jian and Li (2021), especially in China, SF is an exciting and possibly fruitful area of research due to it having attained more prestige and coverage within and outside the country, as well as its display of social commentary. Especially narratives of Artificial Intelligence in SF can help us understand what views, hopes, and desires the nation has for this disruptive technology.

Agreeing with previous research from Xu (2020) on Chinese SF, AI narratives in *The Robot Who Liked to Tell Tall Tales* and *Goodnight, Melancholy* are connectionist and also very human-like. I found that the AI described was capable of learning by itself and performing tasks, such as giving emotional support and creating stories. However, even with the ability to outperform humans in almost all tasks, a clear distinction was made between the intelligence of a machine and that of a human, and in both narratives, AI was loyal to humanity. Unlike in

the research of Hudson *et al.* (2021), I did not note strong tropes, such as killer robots going haywire. Also, contrary to claims by Fast and Horvits (2017), the futures with AI were depicted as neither overly pessimistic nor optimistic.

Moreover, while I could situate both works into Cave and Dihal's (2019) gratification narrative scenarios, I did not find that either story could be placed on either side of the binary of utopia or dystopia. I hypothesize these findings to indicate that people in China generally have realistic expectations toward the future with artificial intelligence, and the thought seems to be that while some problems will be solved, new ones will arise. This finding would be in accordance with the findings of Wike and Stokes (2016) that people in China are more optimistic about the future and believe that technological advances play a significant role, leading to greater trust in AI. It might be beneficial for stakeholders to note that Chinese nationals might have fewer fears regarding new technologies while engaging in decision-making on topics such as AI ethics and policy.

Xia (2014) argues that SF in China is primarily written for the local population, but I was surprised by how globally relevant both works were and not necessarily tied to China. My finding would align with Liu's (2014) statement that Chinese SF is for a global audience and not solely for the national population – yet cultural cues might have been lost on me. The works also displayed apparent efforts to engage in a dialogue with the reader to break the fourth wall and lead a conversation. Like in both works of SF, my thesis also contributes to this broader societal discussion of the future of humankind. I argue that my main contribution to science and society through my thesis is laying the foundation for multidisciplinary work, tying arts, sciences, culture, policymaking, and technology together.

5.3. Research Limitations and Suggestions for Future Research

Although I believe that my empirical approach was justified for addressing the research questions of this study, the approach certainly comes with a set of limitations. First, it is important to practice purposeful sampling as this both supports the transferability of research and maximizes the utility of information (Flyvbjerg, 2006; Pettigrew, 1988). I attempted to set criteria and justify the reason behind my choice of SF stories included in my study. The stories chosen were judged to be the most current, available as well as the most representative works of Contemporary Chinese SF at hand. However, a broader range of SF from different authors would have aided in capturing a wider array of sociotechnical imaginaries as well as provided more credibility through a greater number of data points for my research. In addition, I used translated material, instead of works in the original language. This may have resulted in certain meaning being lost in translation.

Secondly, the concept of AI is slippery in and of itself, both in academic literature and in science fiction. Defining AI is not a simple task and is also highly dependent on factors such as culture, education and context (Hudson, 2021). This study considered only stories of a certain type of AI. A broader discussion is needed for identifying AI's boundaries of function, status as an entity as well as responsibility and agency in society. SF stories tend to portray and emphasize general AI, often giving spotlight to AI with human-like or beyond human levels of intelligence. Also the researcher, as a human, has a tendency to recognize AI characters with motives, personality and agency, rather than systems. While I was aware of this and made a conscious choice of narrowing my research down by predominantly focusing on AI characters, future research could focus on more carefully defining AI within the context and recognizing different levels of AI in SF.

Thirdly, this thesis uses hermeneutics as a method. While hermeneutics offers the researcher room for interpretation and subjectivity, conducting hermeneutic research should also be done with extreme caution as the possibility of placing own biases into the study, is high. McCaffrey et al. (2012) guide that hermeneutics should be avoided if there are “other ways of extracting the meaning of the original author”, for example through an interview. If this is not possible, as was the case in my study, cooperation and discussion with other people improves the quality of the study. While I did discuss my thesis with various people, this was not done methodologically or structurally. Discussion would best be held with research colleagues and the people at the receiving end of the results of your study.

Also other frameworks, in addition to the framework by Ajjawi and Higgs (2007), could have been evaluated. For example, the Causal Layered Analysis (Inayatullah, 2004) may have been better suited for the extraction of meaning and assumption entwined within SF narratives. More importantly however, I suggest that future research, instead of trying to extract meaning from SF, would engage on exploring the plausibility of AI narratives. This would generate knowledge that could either elevate or shatter sociotechnical imaginaries as well as spur international dialogue.

Lastly, my indicative findings are based on my understanding and analysis of Chinese science fiction and sociotechnical imaginaries. Due to the nature of STS research, emphasis is on multidisciplinary. While I do have a broad educational background, by no means am I a specialist in any of the fields needed for this particular study, nor do I suggest that my knowledge on Chinese culture or language is sufficient enough to provide truly meaningful findings. As already states, future research on this topic should be conducted through collaboration between faculties and nations.

6. Conclusion

“Technology is the answer... but what was the question?”

– Cedric Price (1966)

“Sci-fi novels are concerned with problems faced by all of humanity. Crises in sci-fi mostly threaten humanity as a whole. This is a unique and treasurable trait inherent in the genre - that the human race is perceived as a single entity, undivided.”

– Liu Cixin (2016)

In a globalized world, how China envisions the future and how Chinese people view the relationship between science and technology, culture, and society, will significantly shape the AI that will be built and thus the direction and organization of the world's future (Chen, 2019). However, as China's national power is visibly growing, the rest of the world remains unsure what China will do with its newfangled capabilities (Legro, 2007). The future that China is building for itself and the rest of the world remains an issue of contentious debate among scholars, policymakers, and businesses alike.

STS research suggests that how we see the future today affects our actions in the present (Harvard STS Research Platform). My study sought to build a greater understanding of how the future of AI is perceived in China. To do so, I explored sociotechnical imaginaries of AI in contemporary Chinese science fiction literature. First, I identified whether or not SF was a valuable tool in exploring sociotechnical imaginaries within the context of China. My study outlined how Chinese SF has taken a more critical role in China and worldwide, with works like *Three-Body Problem* by Liu Cixin taking on the global stage. New strong narratives of the

future are coming up in China. While at birth, Chinese SF was a tool for propaganda, building a dream of a future in which China is assertive and not subjugated, and later during the People's Republic, it became a tool to teach science to children; today, Chinese SF is concerned about depicting the future of the entire human race and its relationship to AI (Liu, 2014). Following the accelerated modernization of China, SF reflects the changes in the thinking patterns of Chinese citizens. Much like in the golden age of SF in the United States (1938-1946), China is possibly creating sociotechnical imaginaries that can rival those of, for example, *Frankenstein*, which to the day has an impact on how we view intelligent machines. While by no means offering accurate depictions of the future, science fiction literature is a literature of possibilities, full of imaginaries to pave the way for the future.

After confirming that Contemporary SF is worthy of research, I attempted to identify and analyze AI narratives in *The Robot Who Liked to Tell Tall Tales* by Fei Dao and *Goodnight, Melancholy* by Xia Jia. While different in style and content, both works offered some similar narratives of AI. In both works, AI had taken over jobs previously thought only possible by a human. AI had become emotionally supportive and creative. Humans have continued to design AI similarly to neural networks that work in a human brain, and the machines in the stories lean heavily on algorithmic theory. While surpassing humans in specific tasks, AI is still loyal to humans, and the two forms of intelligence have begun to coexist while the narratives are not utopian, they both offer hope. Fei Dao and Xia Jia also make an apparent effort to engage in current issues and discuss the future with the readers on the desirability and ethics of these possible futures. These findings are in line with previous research (e.g., Xu, 2020; Berggruen Research Center, 2020)

While my study offers no clear conclusions, what made my attempt at exploring China's AI imaginaries worthy of pursuit is that Artificial Intelligence plays a crucial role in "the fourth industrial revolution" (Schwab, 2016). Like the industrial revolutions, the fourth promises significant human advances (Schwab, 2016; Lee, 2018). AI's practical applications evolved slowly in the beginning. However, in the past years, AI has become the world's most prominent technology, with PricewaterhouseCooper estimating AI to have generated 15.7 trillion dollars (about \$48,000 per person in the US) by 2030, up to a 26% boost to local economies (Lee, 2018). Now digital life has disrupted eons-old human activities through the internet (websites, search, advertising, e-commerce, social media), applications in business, perception (financial services, education, public services, medical, logistics, supply chain, back-office), perception (security, retail, energy, IoT, smart homes, smart cities), and autonomous applications (agriculture, manufacturing, transportation) (Lee, 2018). AI as an omni-use technology will penetrate virtually all industries. At its best, AI will be able to tackle questions regarding climate change, world hunger, and poverty and liberate us to do more stimulating jobs (Lee, 2018). AI has only penetrated 10% of industries, so there is undoubtedly room for reimagining our society (Lee, 2021). There are even predictions that general artificial intelligence (GAI) will outmatch humans even in creative and emotional tasks (Schwab, 2016), just like in the SF novel AIs, the Robot in *The Robot Who Liked to Tell Tall Tales*, and Lindy in *Goodnight, Melancholy*.

By its very nature, the fourth industrial revolution is different from the other three revolutions; AI's rise understandably raises concerns (Schwab, 2016; Lee, 2018). There are plenty of unanswered questions, such as how AI will affect what it means to be human, productive, and exercise free will (Anderson *et al.*, 2018). There are perils and challenges such as privacy infringements, autonomous weapons, AI biases, security risks, deepfakes, autonomous

weapons, and job displacement (Lee, 2018). In addition, as Wilson (2013) notes, there is a risk of unintended adverse effects at a scale unheard of before. Wilson (2013) reminds us that the consequences of AI could be enormous, possibly resulting in grave, global damage to humans ("global catastrophic harm") or severe, permanent damage to the planet earth – including, possibly, human extinction ("existential harm"). Wilson (2013) adds that although the chances of global catastrophic risks are comparably low, humankind should be aware to avoid losing the gamble. While international law has been crucial for the global regulation of other global risks like biodiversity loss and climate change, AI technologies do not have a clear place in existing international regimes, and thus any nation is more or less free to develop AI to its liking (Wilson, 2013).

According to ÓhÉigearthaigh et al. (2020), greater understanding may reduce critical tensions within the global AI governance sphere and provide knowledge that supports substantial diversity of values while allowing consensus on the most crucial topics in ethics and governance of AI. If critical tensions are ignored, and if AI is framed as a race between nations, instead of a single unified future, China's gain will be seen as America's loss and vice versa. In this scenario, there will be no notion of shared progress or mutual prosperity, just a desire to stay ahead of the other country regardless of the costs. Much of the news around AI is centered around this mentality, and many commentators in the United States have used China's progress in AI as a rhetorical whip to spur political action. However, as Lee (2018) and others (Tomašev et al., 2020; Stahl et al., 2021) have noted that AI's value lies not in destruction but creation. If understood and harnessed correctly, AI can genuinely help humanity in ways many cannot yet imagine.

Although, opinions on how far in the future AI advances might lie vary widely from expert to expert, many of whom predict decades until we see human-like AI (Grace *et al.*, 2017). However, laying a foundation for collaboration needed for an effective response to advances may also take decades of work (ÓhÉigearthaigh *et al.*, 2020). Thus, researchers need to begin understanding elements needed for cooperation today. Russel (2019) proposes that value alignment is key to avoiding catastrophic outcomes. It is important to design systems on global shared values and principles while finding ways to respect non-shared values and build mutual understanding. Goffi (2021) suggests that nations and cultures worldwide should begin to turn to each other for inspiration because not a single country will be able to form answers to pressing questions regarding AI – nor should a single region have the power to do so. Goffi (2021) continues by stating that "cultural diversity, its particularisms, and the different perspectives outlined in broad strokes are all elements we need to consider in the construction of ethics in AI. Without preconceptions. Without prejudice. Without value judgment. We have to learn to listen to depolarize and depoliticize the debate. Furthermore, in doing so, we can open it up to more perspectives."

In presenting the findings of my study, I call for further research on the topic and a joint effort of humanity to build a global future. While China will arguably have a significant impact on the evolution of AI, our world is an intertwined system in which no nation or individual alone dictates the road we take, nor can provide all answers to the pressing question of what it means to be human in an age of machines. Unlike AI, we can decide which goals to pursue as a human race. There is great value in shared and mutual dialogue and drawing from various sources of wisdom and knowledge. I hope that my thesis has brought the world – if only a sliver – closer to working beyond national borders to write our own AI story.

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