Systematisch-Theologische Perspektiven

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The Final Frontier

Investigating the Impact of Science Fiction on our (Technological) Future

Abstract

This paper will investigate the relation between science fiction and the real, emerging future. For this purpose, it is necessary to ask what influence works of science fiction can have on reality. This paper will argue in a focused way that fiction can refer to possible future realities, while also calling contemporary events and trends into question. The example of *Star Trek: The Next Generation* as *soft science fiction*, specifically the character of the android Data, will help to illuminate how fiction already reveals problems and questions that are otherwise only partially recognisable or imaginable in the present.

1. Introduction: engaging in the worlds of science fiction

We live in an exciting time, full of technological innovations that seem almost futuristic. Within seconds we have access to almost all the knowledge there is with our smartphones alone. However, for fans of fiction, this world may sometimes seem a bit bleak compared to what we read in books and see on screens. After all, our cars don't fly yet and aren't even fully emission-free. There are countless diseases we can't cure with current medicine. We still have a long way to go. There seems to be an invisible frontier that separates us from the future, the world we imagine but probably won't even experience ourselves.

Perhaps that is the crucial point. We imagine the future and we do so in umpteen different ways. The limits that apply to reality

do not apply to our imagination. In our minds—in literature, film and television—we set out to explore the unexplored, to imagine the unimaginable.

And so, this is all about precisely the frontier between the now and the *maybe someday*. As we will see, this frontier isn't as intransigent as it may seem. It might be worthwhile exploring how science fiction can affect us and our future really and truly. Because in the moments when spaceships fly across the screen, victims of horrific burns are being saved by being transformed into cyborgs, and cars act as time machines, the lines blur. The *maybe someday* is finding its way into the here and now and leaving footprints. Even if quite a few scenarios seem very unrealistic at first glance, the stories of science fiction never fail to captivate us—in the end, they might be part of what the world might be like in the years to come. Suddenly, we are presented with our greatest hopes and most terrifying fears for the future, and we begin to wonder what we want as humanity and how we want to evolve.

Which works inspire us to reflect may vary. However, some of the better-known works in particular can provide us with an opportunity to consider the relevance of science fiction for the present day. In this case, it is Star Trek, which offers a number of opportunities for a scientific approach.[1]

2. What is science fiction?

If one speaks of science fiction here as a matter of course, the reader must be aware that this genre[2] is actually quite difficult to define. Although the term evokes a whole range of associations, scientists, authors and fans have never really come to a shared definition.[3] One of the earliest attempts to outline the genre can be traced back to the publisher and author Hugo Gernsback, who initially called it

1 See *Bauer*: Utopie, 3.

2 Derived from the Latin word 'genus', a genre refers to a category of texts, movies or similar. See *Kirsten:* Diskursivität, 21. Genre patterns describe the inner characteristics of corresponding works. See ibid., 23. Science fiction is one of the better-known genres.

3 See *Vint:* Guide, 1.

scientifiction in 1926. He recurred to H. G. Wells, Jules Verne and others and pointed out the connection between scientific fact and prophetic vision in their works; later on, he changed the terminology to science fiction.[4] In the years that followed, many works were published that are considered classics of science fiction. These classics, for example, are the influential American works of the 1940s by Isaac Asimov, Arthur C. Clarke, Ray Bradbury or Robert Heinlein—they have become the gold standard. While elements of the classics are still recycled today, the boundaries of the genre are constantly being challenged. Justifiably, the objection can be raised that some works recently published under the heading of science fiction no longer have much in common with the works that originally brought this genre to prominence.[5]

Science fiction, as a genre and concept, is too multifaceted to fit a single definition. Here, I will not attempt to provide a specific and satisfactory definition of the genre, but instead I will work within the framework provided by P. Schuyler Miller.

It is precisely in the attempt to distinguish science fiction from other genres with similar themes, such as fantasy or horror, that some key overlaps become apparent.[6] In the realm of fantastic literature, we encounter that which is impossible (or has yet to be made possible). While fantastic elements might appear in multiple genres, such as fantasy or horror, we discover a certain focus in science fiction: scientific and technical speculations and visions that find expression in topics such as space travel, AI and time travel—which essentially corresponds to what Gernsback already stated.[7] But this does not even begin to fully define the genre, at least not anymore. However, it is important to note: "Dass Science-Fiction nicht vorrangig und manchmal überhaupt nicht um *science* oder Technologie kreist, ist durch die kulturwissenschaftlichen Analysen der letzten Jahrzehnte gezeigt und gut belegt worden […]. Dennoch stellt ‚Technik' stets zumindest eine Rahmenbedingung für all jene

4 See *Latham:* Definitions, 7.
5 See *Vint:* Guide, 2.
6 See ibid.
7 See ibid., 3.

Geschichten dar, die überhaupt als Science-Fiction charakterisiert werden können,"[8] as summarised by Christian Schwarke.

So, in science fiction we are repeatedly setting out on a journey into distant worlds with incredible technologies (often set in the future) which sometimes seem more and sometimes less realistic. Of course, it should be clear at this point that there is no such thing as *the* science fiction. This genre itself is already very varied and heterogeneous and becomes more versatile with each appearing work. However, it is worth taking a closer look at the realism of science and logic and how they affect the stories. The aforementioned science fiction author and critic P. Schuyler Miller introduced the term *hard science fiction* for what Gernsback mainly meant by scientifiction or science fiction in his time. The idea is that the story itself is as logical and believable as possible, especially in its understanding of contemporary science and technological development, and in terms of what would become technologically or socially possible in the future with the knowledge of the time.[9]

Star Trek—one extremely fascinating interpretation of science fiction which we'll discuss later on—certainly does not fall into the category of *hard science fiction*, since "everything technical is more or less taken for granted, unless there is a malfunction invented by the authors for narrative purposes".[10] It is not the aim of Star Trek to appear realistic in its technologies. On the other hand, it's not that (realistic) technology doesn't play a role in Star Trek. Especially in comparison with other science fiction series with almost no refer-

8 *Schwarke:* Traum, 49. I'd like to offer a translation: "The fact that science fiction does not primarily, and sometimes not at all, revolve around *science* or technology has been shown and well documented by the cultural studies analyses of the last few decades […]. Nevertheless, 'technology' always provides at least a framework for all those stories that can be characterised as science fiction at all."

9 See *Samuelson:* Modes. Some of the most well-known authors of *hard science fiction* according to what I tried to classify as such might be Robert Heinlein, Arthur C. Clarke, Larry Niven and Andy Weir (as well as some of those already mentioned). If you'd like to see *hard science fiction* on the big screen, *Gattaca* (1997), *The Martian* (2015) or *The Expanse* (2015–2022) might be worth a look (please keep in mind that other people might consider the boundaries of the genre differently). You'll see that the question of scientific realism is really concrete, although that is not to say that this sub-genre is the only one in which realistic technologies appear.

10 *Wenskus:* "Soft" Science Fiction, 450.

ence to the realism of futuristic technology like Doctor Who, the difference becomes obvious. Thus, Star Trek does not seem to be a *technical fantasy*[11] with no reference to reality, but something like *soft science fiction* and among them probably one of the best-known representatives. Technofiction is simply not the crucial aspect, and so speculation often remains in suspense. It is quite noticeable that *soft science fiction* focuses more on social, political or philosophical issues, for which the science fiction setting is used or is quite speculative in terms of science.[12]

But particularly if we accept the precondition that not every idea must be compatible with what we know of physics for what follows, new horizons open up which are not exclusively bound to what we can comprehend with today's standards. The stories of science fiction themselves are often—though not always—able to creatively challenge our current social, political or ecological realities. Science fiction, then, does not arise out of nothing, but rather makes use of what is known and abstracts it for narrative contexts.

In the end, it has to be said that the genre remains difficult to define. Instead, a way has been presented to assign the works to a spectrum rather than a fixed category. On one side of the spectrum, we find well-conceived, coherent *hard science fiction* in terms of technology. On the other side, we are most likely to find speculative *technical fantasy* with no recognisable real-life expectations. On this spectrum, we find works such as Star Trek, which range between the two extremes; this transitional genre can be subsumed under *soft science fiction*.

11 Wenskus calls the sub-genre under which she subsumes Doctor Who, for example, *technical fantasy*. See ibid.

12 See ibid. As I have tried to show, this subgenre is somewhat hazier in its delimitation, with the result that a whole range of works can be considered to fit within it. But I'd like to present a few of the well-known authors either way: H. G. Wells, Mary Shelley and Frank Herbert. For those who are looking for some *soft science fiction* to watch, there are a few prominent franchises which might be seen as fitting: *Star Wars*, *Stargate*, *Planet of the Apes*, *Transformers*, etc.

3. On the relevance of science fiction on the topic of technological innovation

Although I have already tried to show that science fiction and natural sciences can refer to similar objects, for example robotics and AI, in the context of this contribution, it seems necessary to add a few remarks. To a certain extent, it can be assumed that scientific ideas and science fiction influence each other. Future research, for example, has been around for more than 100 years, triggered by the technological innovations that ultimately led to the atomic bomb.[13] "Diese Zunft entstand aus der Einsicht, dass sich Zukunft via technologischem Fortschritt auch autonom, quasi selbstreferenziell ins Werk setzen kann – und zwar auf möglicherweise für die Gattung Mensch existenzgefährdende Art –, wenn sie nicht antezipativ gebändigt wird."[14] So the interest in learning to understand the future is present. On the other hand, fiction also offers points of reference that may themselves have had an inspiring effect. Autonomous vehicles were already thought of by Isaac Asimov in the 1960s. We also find bionic limb prostheses in the first Star Wars movies. One of the first authors to be aware of the potential of AI for fiction, but also to recognise the risks, was also Isaac Asimov. His Three Laws of Robotics was included in his collection of short stories from the 1940s and 1950s, *I, Robot*, and later featured in the 2004 movie.[15] But there are many more literary and cinematic explorations of the subject, more than could be discussed here.

And yet: science fiction is not the crystal ball that lets us catch a glimpse of the future. In fact, the goal is almost not at all to actually make realistic predictions. "Although s[cience]f[iction] does not predict the future as is sometimes claimed, it is the mythological language of technoculture and thus it plays a central role in producing the future through the dreams and nightmares it offers for our contemplation,"[16] as Sherryl Vint expresses.

So, it's hardly about what will actually happen. It's more figuratively about what we expect from the future and what has meaning

13 See *Müller-Friemauth*: Zukunftsforschung, 47.
14 Ibid.
15 See ibid.
16 *Vint:* Guide, 5f.

for our lives. Science fiction includes social criticism and warnings against current developments, as well as reflection on what is truly important, in the guise of fantastic adventures and post-apocalyptic worlds. Of course, this happens to varying degrees, especially in terms of quality—hardly anyone will watch Sharknado for its political implications, although it is quite hilarious.

4. Star Trek

So, why should we want to talk about Star Trek here, too? I think the Star Trek universe contains a whole range of moments in which the frontier between the real and the fantastic, between the present and the *maybe someday*, becomes blurred. The amount of material we're talking about is not without significance: after the 1965 pilot entitled *The Cage*, there have already been at least eight live-action television series, three animated series, and one anthology series with a combined total of over 800 episodes as well as 13 movies. By the 1990s with the series *Star Trek: The Next Generation* (1987–1994), at the latest, Star Trek had gained a pop-cultural relevance which most likely exceeded any expectations.

It can be assumed that probably everyone as of today has heard the following words at least once before: "Space, the final frontier. These are the voyages of the starship Enterprise. Its continuing mission: to explore strange new worlds; to seek out new life and new civilizations; to boldly go where no one has gone before."[17] It can be assumed that Star Trek indeed wants to confront us with limitations. On the one hand, it confronts us with the limits of what we know and can understand and, on the other hand, with our very own possibilities as humans.

17 The opening sequence of each episode of *Star Trek: The Next Generation* (TNG) begins with these words spoken by Patrick Stewart as Captain Jean-Luc Picard. This is a slightly modified and gender-neutral version of the text from the series *Star Trek* (1966–1969), where the sequence is spoken by William Shatner as Captain James T. Kirk. The last sentence is based on the Portuguese poem *The Lusiads* by Luís de Camões from 1572, which is about the discovery of the sea route to India by Vasco da Gama. See *Puchner:* Story, 281.

After all, Star Trek is set in a distant future. The chronologically earliest Star Trek series, *Star Trek: Enterprise* (2001–2005) is set in 2151, while others are set even further in the future, like *Star Trek: The Next Generation,* which is set in 2364. But all Star Trek series have one thing in common: they want to show us what the future might look like for us one day, without being strictly bound to the limits of physics but with a view to social interaction.[18] After all, according to its creator Gene Roddenberry, Star Trek was designed as a humanistic utopia, whereas the expanding franchise has somewhat taken on a life of its own over the course of time.[19]

But there is more to Star Trek than just a million-dollar franchise. While we follow the crews of the starships USS Enterprise, Voyager or Discovery and see how they explore unknown worlds to learn and conduct research, when we watch the crew of the starbase Deep Space 9 trying to mediate between peoples, Star Trek en passant takes us on a completely different journey: We follow in the footsteps of philosophy, occasionally without even realising it. Sometimes the connection may be obvious, such as when it comes to the utilitarianism of the Vulcans[20] or the transhumanism of the Borg[21], but sometimes we are very subtly led to question ourselves and our way of thinking.

> Lernbereitschaft meint in diesem Sinne einerseits das Ausschöpfen des eigenen Potentials, andererseits eine Haltung der Offenheit gegenüber Neuem, die Korrigibilität von Ansichten, die sich als unangemessen erweisen, und eine damit einhergehende Bescheidenheit im Umgang mit dem tatsächlichen oder vermeintlichen ‚Anderen' (die freilich selbst wiederum mit großer Überzeugung vertreten wird): "Wir stehen erst

18 See *Tolan:* Physik, 303.

19 See *Bauer:* Utopie, 2.

20 The Vulcans and their philosophy are quite famous for Spock's words "The needs of the many outweigh the needs of the few". *Meyer*: Star Trek II. The Wrath of Khan, 39:05.

21 The Borg are not a species in the biological sense but add individuals to their collective through assimilation by technologically altering them into cyborgs and integrating them into the collective consciousness. They appear in several series and episodes and also the movie *Star Trek: First Contact* (1996). If you'd like to learn more about the transhumanism of the Borg, I recommend *Dinello*: The Borg.

am Anfang [...] Vieles liegt vor uns. Vieles müssen wir lernen" (TNG, S1E26),[22]

as said by Captain Picard in Star Trek: The Next Generation. In the process, however, not only do the much-loved screen characters learn, but so does the viewer.

And that is precisely why Star Trek lends itself as an example with which to illustrate the link between science fiction and the present with its important questions. Star Trek provides dozens of connecting points for reflection, including robotics and AI. A particularly noteworthy character in this regard is certainly the android[23] Data, who, as a crew member of the USS Enterprise, still devotes himself to his very own quest, the search for a more human existence.

4.1. The potential of Star Trek

Even if we don't pay specific attention to why exactly which motifs appear in movies, books and series, we can learn something from them. However, it is the chosen topics that direct the discussion in a certain manner—such as the connection between science fiction and technology. The fictional universe of Star Trek is an exemplary way to directly involve people, regardless of their academic training, in thinking about a future in which people rise above themselves. Although the underlying world view should certainly not be overlooked—after all, Star Trek was also created in a specific, US-oriented context—it nevertheless opens up horizons that question the core

22 *Kruse:* Zukunft, 31. Translation: "Willingness to learn in this sense means on the one hand the tapping of one's own potential, and on the other hand an attitude of openness to what is new, the corrigibility of views that prove to be inappropriate, and a concomitant modesty in dealing with the actual or supposed 'other' (which, of course, is itself held with great conviction). 'We are only at the beginning [...]. Much lies ahead of us. We have much to learn' (TNG, S1E26)." He refers to *Hurley:* The Neutral Zone, 44:17. The actual quote is: "Our mission is to go forward and it has just begun [...] There is still much to do. Still so much to learn."

23 The term android refers to a robot that is supposed to resemble humans in appearance and behaviour.

of all life: What is life worth? What is a living being in the first place? And what protection does it deserve?[24]

However, it must always be remembered that Star Trek is a utopia: In the end, the characters (very nearly) always manage to ensure that everything ends well, the innocent are protected, and unfairness and lack of freedom are overcome. Most recently, this principle was broken up somewhat in *Star Trek: Discovery* (2017–2024) and also the spin-off *Star Trek: Strange New Worlds* (2022–)[25].

Nevertheless, there are points of reference from all the series and films (even comics and books) to show that the considerations made are relevant for us. In particular, the ethical dilemmas were and are explosive and one might say interesting. I would like to elaborate on this a bit more, using an example to show that while Star Trek is not a direct guide for us to find the answers we are looking for, it might open our eyes to creative solutions for an indeterminate future.

4.2 The Measure Of A Man

Now let's finally get to the point where Star Trek and AI converge. I am aware that the episode mentioned here has already been the subject of manifold discussions, but it is nevertheless unavoidable in this context. With the episode *The Measure of a Man* (S02, E09) the series *Star Trek: The Next Generation* explores strange new philosophical problems that no one has seen before. It is about Data, an android, i.e. a robot in the form of a human equipped with artificial intelligence, and his status as property or bearer of rights.

The topic is initiated by the scientist Bruce Maddox, who demands that Data be irretrievably disassembled for the purpose of science, so that his positronic brain[26] can be analysed to finally create more like him. Data is unique even in this fictional version of the 24th century; his functionality and learning ability are extraordinary, but he aspires to be truly human. He is considered a full

24 See *Kruse:* Zukunft, 30f.

25 One quite extraordinary episode in that respect might be Season 1, Episode 6 *Lift Us Where Suffering Cannot Reach*, which first aired on 09.06.2022.

26 This is part of Star Trek's technological fiction. It allows data to be stored and processed.

member of the crew and treated like any other humanoid by the crew of the Enterprise. By having more androids like Data, the utilitarian Maddox[27] hopes to contribute to the efficiency and safety of the crews of other starships by eliminating the need for any flesh and blood having to expose themselves to potentially dangerous situations.

In the face of his own destruction, Data refuses. Maddox cannot comprehend this and eventually demands Data's body because, in his opinion, it is the property of Starfleet, the umbrella organisation under which the Enterprise operates. Captain Jean-Luc Picard sides with the android, and a trial is held to decide Data's future. And more or less surprisingly, it is proven quite impressively how much of a machine Data is after all: He can be turned on and off, the seemingly ultimate proof of his lack of freedom and alienness. But what is the consequence if Data is only a thing? He would have no rights, would be only a modern slave if one could even call him that or simply a tool. At least Picard could not accept that.[28]

Picard therefore asks Maddox the crucial question: How would he define a person with the right to self-determination, a conscious being? He answers as follows: a sentient being is one who is "intelligent, self-aware, and conscious".[29] This addresses an essential problem: What distinguishes Data from a human and in what respects are there similarities? Even though his positronic brain may have been artificially created, Data is capable of performing the most complex calculations in a fraction of a second. This hyperintelligence is even superior to human intelligence in many ways. Also, that Data has self-awareness is not doubted here at least. This is justified by the fact that he is able to relate to his own existence, not wanting to die and striving for something, i.e. to be human. However, it is clear to him that he can never really become a human being; his logic is flawless, yet he feels the desire to discover the human in himself. That finitude, for instance, is an issue for Data picked up later in the series *Star Trek: Picard* (2019–2023): He ulti-

27 He is a utilitarian insofar as he would sacrifice a machine for the sake of human or alien life. That he would sacrifice a living human being (or alien) in the same context is not to be assumed, since he always comes back to the question of consciousness.

28 See *Rosenstand:* Data, 176.

29 *Snodgrass:* The Measure, 36:49.

mately desires an end to his existence because the knowledge of his finitude is meaning that is constituting for him.

The question of his consciousness remains open. Is it even possible that a machine—in the series Data is polemically compared to a toaster—has or develops consciousness? How far can technology go? Or must one ask oneself, in line with Thomas Nagel: What is it like to be an android? and come to the conclusion that in Data's case, one can only assume he has consciousness but cannot prove it unequivocally?

Since we are still in the world of speculative science fiction, we are in a position to attribute consciousness to technology, especially since the series provokes this position. What reality will look like one day is not written in the stars in this case; it depends on what we as humanity are willing and able to create, but this cannot be elaborated on at this point.

In any case, in *The Measure of a Man,* the verdict is in Data's favour, his continued existence is assured and, even more, the status that the crew has always accorded him is now also legally recorded.[30] The question of his consciousness may not have been settled to the viewer's satisfaction, but if there is even the slightest doubt that Data has no consciousness, Picard deduces that he must be treated as if he had one. This moral decision has far-reaching consequences in the Star Trek universe, as now other artificial entities, such as the holographic Doctor in *Star Trek: Voyager* (1995–2001), also claim dignity and, as a consequence, the right to self-determination (S07, E20).

5. Outlook: the future begins today

As said before, this is science *fiction*. We can simply pass over many of the problems and remaining questions of reality by making assertions and premises that are established as true or false in the fictional world. One makes things very easy for oneself this way; that is obvious. But it is not the purpose of fiction to depict reality and to take it seriously; they are thought games that show us *what-if* scenarios

30 Please note that this is just a small insight into the discussions surrounding this episode. In the end, essentially it is a question of Data's personhood. See *Sorgner:* Android, 242f.

and inspire us to think again. And some of the challenges our heroes face could very well be ours one day. It is therefore important to take these questions seriously. Disciplines such as robot ethics show that, at least here, the problems of the world (which are still purely fictional in Star Trek) already affect our reality, which is becoming increasingly technologised. Because science fiction is already raising such questions, we are already dealing with them and can influence developments for the future in this way. And that in turn leads us to relate to the world as it is or should be. It makes us ask ourselves now how we want to relate to the technology of tomorrow, to robots (or even androids), for example. However, this happens in interaction with what the world has to offer.

In the end, it is certainly easy to get lost in a present as complex as ours. Progress is all around us. We are trying to participate in a future that we ourselves will probably not even live to see. For us, the distinction between now and *maybe someday* will always remain to some degree. But on the other hand, we have our wishes and fears about what humanity will be one day. We tell stories about it and hope to be heard. These stories connect us and make us think together without any preconditions, so that these stories, science fiction, can blur the line.

We would do well to listen to each other and see what science fiction is all about. In science fiction, we find hints of what might be one day and what had better not be. This way, science fiction also collaborates creatively on the future.

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