

# **Impact of science fiction literature on science and technology**

**Future challenges of Informatics**

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# Introduction

In this essay I will discuss various impacts of science fiction literature on science and technology. Inventions that already came true and were based on the principle of science fiction stories and also some that might or might not be possible in the near future.

Science fiction has always been a source for various inspirations in real life. It's making use of the creativity that the writer of the story was able to put into his work possibly not knowing that his ideas of future will actually come true in the near future. In the fifteenth century Leonardo da Vinci was experimenting with various war and flying machines. Many considered him to be mad for these inventions seemed really unnatural to common people those days, yet almost every of da Vinci's inventions have some kind of interpretation in the modern age. However da Vinci wasn't a science fiction writer. He believed in his inventions and knew that in some way they might be life-changing for the whole nations. What is then a difference between a inventor from a fifteenth century and a science fiction writer? Do science fiction writers also believe that their ideas might have some impact on the future technology or science?

# I. The power of imagination

The human mind is a beautiful tool. Not only we are able to create, describe, to tell a story, we have a power of creating the whole worlds that exist just in our minds and put it on paper using just a pen. Science fiction literature is a product of creating such magnificent worlds of pure imagination and is a source not only for fun reading, but can create impact on the real world.

Some authors of science fiction are scientist themselves and they tend to write about technologies they wish could be true or wish they could exist in the real world knowing that they really couldn't. On the other hand, there are science fiction writers who's education consist only of their own imagination and therefore their worlds could possibly somehow exist in a real world. Such ideas can be taken as a challenge to inventors of modern age. About fifty years ago, people imagined the near future with flying cars on a daily basis, people being able to learn through data chips inserted in their brains and so on. If we look back on the old movies, picturing the future as a highly futuristic worlds with such inventions, we can see that not much have changed since then. We still don't have flying cars and we are not able to learn through inserting a data chip into our brains, but will we be ever able to do such a thing? It's quite possible. The main problem is usually the time of the prediction. In a classic movie *Back to the Future*, the main characters travel to year 2015 which isn't so far from now, yet the movie describes that year as very futuristic. When we watch *Back to the Future* today, we notice the scent of 1985 filled with inventions like self-lacing shoes or hoverboards in that future. Since 1985 when the movie was made, people are waiting for 2015 just to finally be able to get to school using their hoverboards. This invention still needs some work but it has been known, that Nike is working on a technology of self-lacing shoes which is a classical example of impact of science fiction literature on our modern technology.

Not all of science fiction stories take place in a near or far future, but are mostly placed in various parallel universes and therefore they give the author a chance of mixing ancient history with technology that wasn't invented yet. Typical example might be the TV series *Firefly*, where the whole world

represents a wild west with various space ships and futuristic weapons. In these kind of stories authors let their imagination work to the maximum. They are able to come up with an invention not yet invented but such that they would have found a use for it in their daily routine. First examples of such inventions were automatic doors, credit cards or video calling. These I will however discuss later.

There are many areas of human mind to explore for nobody can imagine what the future holds for us. And therefore science fiction literature can be a source for many ideas that might improve our daily life even though they were just a simple way to make a world in a book or movie a little more futuristic.

## II. Science fiction inventions that came true

We are all familiar with classic novels like George Orwell's *1984*, Karel Čapek's *R.U.R.* or Jules Verne's *Twenty Thousand Leagues Under the Sea*. As well as with classic science fiction movies like *Star Wars*, *Star Trek* or *Blade Runner*. All of these stories contain ideas that had various impacts on science and technology of modern age and I will now list some of the greater inventions that came true in the real world.

### **Bionic Limbs**

Bionic limbs are very popular in science fiction describing the character as cyborg and giving him special abilities granted by robotic arms, legs or several others various non-organic implants. They have been featured in science fiction literature since the early sixties in *The Six Million Dollar man* and many other popular movies and series. Typical example may be the Borg of *Star Trek* franchise or many characters in *Star Wars* universe, where many heroes were implanted with bionic hands that were cut off in a lightsaber fight. Most famous science fiction character with bionic limbs is the *Star Wars* villain Darth Vader, who had all his limbs replaced by mechanical parts.

Nowadays we still don't have bionic limbs that people are able to control by mind, but many amputee patients have found them useful, granting them

ability using some of their muscles as a controller for bionic limbs. Earlier this year a young Englishman Patrick Kane has become the first teenager with a bionic hand in the UK. His bionic arm is controlled using a special software, where he can edit various settings of gripping techniques which allow him to be able to lift mugs, glasses and various objects that make his life easier. [1]

## **Video calling and holograms**

I'm referencing these two inventions under a single point for they both have similar use in communication and entertainment. In 1911 a Luxembourgian American inventor Hugo Gernsback wrote about the fictional video screen - The Telephot [2]. A device that allowed people to communicate using a video screen mounted on a wall. Telephot appeared in Gernsback's novel *Ralph 124C 41+* and this idea created a whole new aspect in communication technology by adding the vision of the caller to the whole idea of telecommunication. Video calling have appeared in almost every science fiction story including space or time traveling. In *Star Wars*, George Lucas came up with an idea of going even further by displaying the communication between characters using holograms. This was a boom in science fiction universe and the scene with Princess Leia hiding the plans of Death star in the tiny droid R2D2 became one of the most famous from the first movie.

Video calling is a standard for today's people. We use Skype on a daily basis and call our friends and families throughout the world using just internet connection and streaming data transfer. Holograms on the other hand were used only as part of entertainment. This idea represents a complex solution to the communication, where video calling is simple and reliable. In 2012 on American Coachella festival famous rapped Dr. Dre performed a duet with deceased rapped Tupac Shakur who was projected on a stage using many special projectors that showed the viewer an image where Dr. Dre and Tupac stood next to each other singing one song. Dr. Dre ordered this special effect at famous Hollywood production studio and the result was really impressive. The same application of hologram was used as a performance of deceased pop singer Michael Jackson in the spring of 2014. The singer was accompanied by live dancers creating a marvelous show.

## CCTV

The classic camera system as we know it from the streets and banks is common for today's people. It is one of the most famous science fiction inventions as described by George Orwell's dreaded *1984* where the people were under a constant watch of a mysterious Big Brother watching their every step and move. The novel itself was written in 1949 and described the future in not even fifty years. CCTVs arrived to the world in the 1970s and there are now an estimated four million cameras in the Great Britain alone. [3] Citizens of UK made a series of protest and petitions against such serious violation against people's privacy. CCTVs are mainly used for watching the streets and helping the police determine the reason of car accidents and such. Many other cameras are used for security however creating such wide network of CCTVs can be really scary and in the end we are not getting so far away from Orwell's predictions. Since face recognition software is also highly advanced, it's possible for FBI or CIA to look for wanted people on the streets as well. Again getting closer to Big Brother, aren't we?

## Touchscreen technology

In early sixties the crew of *Star Trek's* ship Enterprise were able to access their computers using a mobile device they carried with them. Controlling the computer just with a touch of a hand. Many other interpretations of such technology followed. In Douglas Adams's novel *The Hitchhiker's Guide to the Galaxy*, the main book is also described as a single screen controlled by touching. The simple gesture of a human hand not being forced to press buttons with force created a boom in latest ten years when touchscreen technology took over the world. Most of our mobile technology is now controlled by touchscreens. In *Star Trek*, Spock was able to use his computer by hand gestures, moving the items on the screen using his hand. So why stop there? Many famous science fiction stories predicted this amazing technology and their interpretation showed a great impact on today's mobile devices. In 2002 the movie *Minority Report* was released showing Tom Cruise resizing his screen with multiple touch. The same technology followed in next 10 years.

## **Digital books**

In 1961 Stanislaw Lem's novel *Return from the Stars* described a device of books that "turned into crystals with record contents" that are read and navigated by touchscreen technology. Fifty years later, fiction became reality as first tablets and Amazon's Kindle were invented, giving the reader a whole new experience of a book in a digital form.

## **Credit cards**

Credit cards are now a standard method of paying all around the world. The way of secure payment gives people the feeling of safety of their possessions. Touch-less credit cards became a hit in the last three years and have largely improved the speed of credit card payment. Customers are able to pay a smaller amount of money with no need to enter the security pin code which improves the speed of the transaction.

Credit cards were predicted as a fiction already in 1888. In Edward Bellamy's novel called *Looking Backward*. [4] Bellamy was able to predict the credit card form of paying if amazing accuracy. In his version of the future world, credit card system is backed by the credit of American government. Each person is given a certain amount of credit on their cards and the government uses the part of GDP to pay off that credit. Bellamy also described the idea of double receipts and how the credit cards would be distributed throughout the whole world.

In 2011's Hollywood movie *In Time*, people use time that remains to the rest of their life as a payment. They are granted hours as a salary and can buy a coffee for six minutes of their life. Movie symbolizes how rich people can live forever and the poor have to literally work for living. Several similar ideas of payment methods were described in many science fiction worlds, however none was as accurate as Edward Bellamy's credit cards.

## **Genetic engineering**

Genetically modified food is considered a standard nowadays. Every day we consume genetically modified products that were altered to achieve longer durability or such. We consume such food without even realizing it has been genetically modified. Also test tube babies, animal cloning and genetic

engineering are all part of modern science. We are able to clone animals like it has been predicted in many scientific novels. It is all part of our everyday life but there was a time when genetic engineering was greeted with horror. In 1932's Aldous Huxley's *Brave new World*, the genetic technology led to the downfall of mankind. Nowadays we have a strict rules when it comes to genetic modification and altering the state of products. Luckily we are far away from falling into the pit of our own deeds.

### III. The Source of ideas

I could go on and on with many other inventions that were predicted in science fiction literature and have now a representation in a real world. So where does the fiction stop and reality begins? Do the authors of such ideas realize that they might be a source for improving a human life? It is hard to ask such questions, for every author had a different state of view for his stories. We can take the idea of robot. Karel Čapek came up with the term "Robot" from the word robota (work) and robots (Robotniks) were named as workers or slaves. The meaning of the word changed overtime and gave a writer the idea of robot reaching for the leash and enslaving its creator. It is possible that Karel Čapek believed in the inventions of robots in the near future. But was he afraid of it? The idea of a robotic slave-worker seemed useful to the point where robots were able to think or even feel. There came an idea of creating an artificial intelligence. Imagine how wars would look like if they were fought by robots instead of humans.

These are the main ideas that had impact on science and technology in real life. Ways to improve human life using imagination of an artist, a writer. Inventions I named above could have been invented without science fiction literature, without these kind of predictions, but there are those that were strongly influenced by the work of fiction.

The phenomenon of the fiction becoming reality turned out to be great for business. Factories were tending to come up with an idea they found in a comic, a TV show or movie and translate it to the real world forcing the customers to buy it by turning their dream worlds into reality. Nobody would



even think about self-lacing shoes if Marty McFly didn't have them in *Back to the Future*. Nike took their chance and I believe this idea will really sell. Such inventions that were created just as a funny joke or a simple way to widen the technology breach of the science fiction world can turn out to be useful and can become a hit in the present time.

## IV. Technology purely inspired by science fiction

Above I have mentioned the most famous technology inventions that came true after they were predicted in the science fiction literature. Now let's take a look at those that were purely inspired by the ideas of science fiction literature itself or might be invented in a near future.

### **Force fields**

In *Star Wars* universe the force fields are shown as a wall of liquid-like walls that protect ships and soldiers against enemy fire. They are powered by some kind of generator inside the "bubble" that covers the ship or a tank. Such walls cannot be penetrated by any kind of military lasers.

The American military defense department seized this idea and decided to experiment with it in a way able to be represented in a real world. The real world version of the force field isn't built to protect the army vehicles from lasers of course, but from RPG rockets and grenades. [5] The first tests for the new force field technology started in 2002 and they were successful. The force fields were able to detect all incoming attacks and were able to zap the grenades with hundreds of thousands of volts of electricity, thus disarming the devices. These real-life force fields are made up of a series of metal plates installed directly to the exterior of a vehicle. In 2005 they were introduced in Iraq and are used against terrorist forces.

### **Projected keyboards and screens**

In late eighties the computer screens in space shuttles and builds in science fiction universe were shown as simple video monitors or flat screens. In

2008 Marvel's movie *Iron Man* showed Robert Downey Jr. as technology genius Tony Stark who was using projected screens and keyboards which he used to manipulate with various items. Screens were projected around him giving him the full control on what he sees and works with. These projected screens were shown in many modern science fiction movies and thus represented a new way of looking at future technology.

Projected screens are nothing new to our technology. Projection has been among us since 1879, when British photographer Eadweard Muybridge started experimenting with projected motion picture.[6] In science fiction universes mentioned above the screens weren't projected on a wall but into the air.

Heliodisplay is an American IO2 technology that produces unique holographic display into the air. The system developed by IO2 Technology in 2001 uses a projection unit focused onto multiple layers of air and dry micron-size atomized particles in mid-air, resulting in a two-dimensional display that appears to float. [6] Projected keyboards are also beyond testing and are functioning on a similar principle.

## **The Submarine**

Jules Verne's classic *Twenty Thousand Leagues Under the Sea* was published in 1870 and told a story about an inventor traveling in his underwater ship called Nautilus. This technology was way beyond the time it was written about. Although submarines existed before the novel was released, it wasn't until Verne's novel became popular that submarine design was improved upon.

## **Virtual realities and Worldwide Web**

Only twenty years ago the vision of a network that would connect the whole world seemed unlikely. Nobody could imagine such massive data transfer as we now possess and use on a daily basis. In a 1997 interview with Time magazine, Tim Berners-Lee, the man who is often credited as the inventor of the worldwide web, spoke of a fascination in his youth of a story by Arthur C. Clarke. This short story written in 1964, featured a setting of computers networked together. These computers then eventually began to think by

themselves. Bernes was strongly influenced by this vision and fifteen years later he proved it to be true except for the thinking part of course. [7]

In last decade people were experimenting with virtual realities using various helmets with projected screens inside them. Many of these experiments ended up just causing nausea to the testers. The idea came from Neal Stephenson's "Metaverse" from the novel *Snow Crash* published in 1992. Where people were able to link with the virtual reality and interact with each other using their virtual projection. This idea was a core for many famous novels and movies such as *The Matrix* which described almost the same plot only that humans were forced to stay in the Matrix without knowing it, for their body energy was harvested from them by robots that ruled the earth.

The top of virtual reality in modern day is a device called Oculus Rift, that projects screen in special glasses that the player puts on. Oculus Rift is mostly used on gaming and has received a huge success when used with horror games.

### **Lightsaber**

The last item of this list is a Lightsaber. A device not yet invented but wished so much to be. Lightsaber is a laser based blade from the *Star Wars* universe that was held by the Jedi knights, the protectors of order in the galaxy. Many institutions have tried to create a lightsaber but weren't successful. The laser saber is a field of powerful energy that is able to cut through anything but another laser. Such strong lasers already exist, the main problem is: how to limit the length of a saber? Perhaps in a not so distant future, we'll carve chicken not using a knife but a Lightsaber.

## V. Summary

There is still much to explore and to invent in a modern technology and there are no limits to the human imagination. The science fiction literature has proven to have a great impact on a modern science and technology and we can only wonder which *Star Trek* or *Star Wars* inventions will we be able to use in real life in the future. Main point of this essay was to show some impacts of science fiction ideas on the real world and to point out some important inventions that came from it.

Perhaps we'll be able to teleport between far distances or travel using a speed of light. The limits of our future are way beyond our imagination. The art of turning fiction into reality is still the most amazing thing about science. We can only hope that it never ceases to amaze us as much as it does now. For there is no limit for a better life of a human being and there are many things left to invent and many dreams to be fulfilled.

# References

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