



STI Watch

A Film Guide for STI neophytes



Teacher's Note

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We all are surrounded by technologies. Some of them have already become an integral part of our life – we do not consider them as something exceptional any longer. Smartphones, touchscreens, voice assistants, robo-advisors, driverless cars, and many more – just several decades ago they were important attributes of science-fiction movies. But nowadays script writers and film directors, working in this genre, need to be more creative and ambitious as the technological progress has long made many fantastic devices and solutions come true. So what is the next frontier of our technological hopes and expectations? How far is it from our current everyday life? And what breakthroughs and challenges await for us there?

As a part of their Research Seminar course, our 2nd year students were invited to think of these questions and check what is more in modern sci-fi movies actually – authors' pure imagination or scientific reasoning and technologies already at hand. The collection of the students' film reviews resulted from this task clearly demonstrates that some technologies exploited now to impress the audience are already a part of our present, that some others have all the chances to become a part of our nearest future, and that our students are a great new generation of STI specialists.

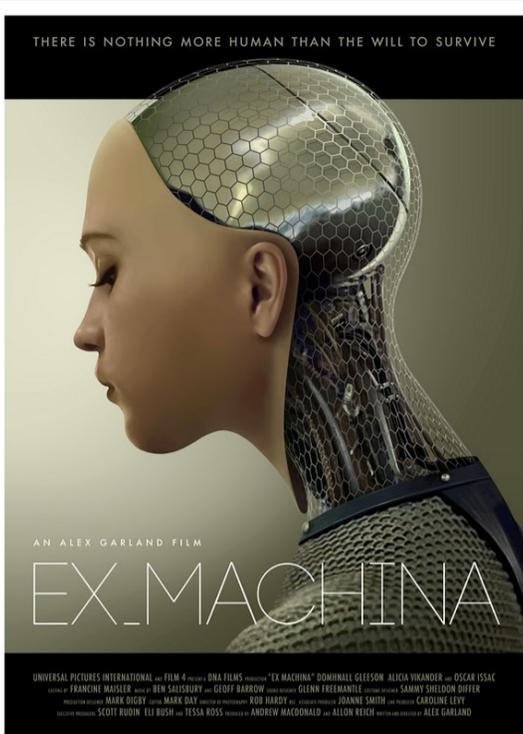
Choose a technology you want to explore. And a film review to get a professional STI guidance!

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Designed by **Galina Podzolkova**



Ex Machina

Genre: **Sci-Fi Thriller**

Director: **Alex Garland**

Starring: **Domhnall Gleeson, Alicia Vikander, Sonoya Mizuno, Oscar Isaac**

Year: **2014**

IMDb: **7.7/10**

Films concerning technological advancements and developments are often categorized in the “action/science-fiction” genre, which is usually characterized by being hyper-sensationalized. However, there are many films that are not only focused on a technology that exists, but they also accurately depict this technology. A film that I think is absolutely superb not just from a production and cinematography perspective, but also considering the plotline and depiction of artificial general intelligence is “Ex Machina” directed by Alex Garland. The film takes place in a somewhat dystopian society, in my opinion it is in the not-so-distance future. The protagonist is Caleb, a programmer who works at a company that is comparable to Google. He wins a company-wide contest where he stays at the home of the famous entrepreneur that is the CEO of his company – a well-known household name such as Mark Zuckerberg.

Caleb learns that the CEO has been building humanoid robots and he is given the task to gauge whether a particular humanoid robot, Ava, can think and be aware of her consciousness – essentially the Turing test. Caleb spends a lot of time with Ava and realizes that she remembers, forms memories, learns from each interaction, and “feels” emotions. Soon Caleb realizes that the CEO has an entire slew of humanoid robots which he treats poorly. Ava asks Caleb if he trusts her, and the audience realizes that not only does he trust her, but he has fallen in love with her and she is “morphed herself” to be exactly what he would want in a human.

The positive impact of this technology is that people who perhaps have issues forming meaningful relationships or have some anxieties, would be able to interact

with a judgement-free robot who is not a person. There are many social positives and I believe that some of them are already evident today in nations like Japan. Humanoid robots are accessible and for individuals with social anxiety or loneliness, this is a solution to perhaps lift them from low moments.

The negative aspect of this is that humans falling in love with humanoid robots may lead to many issues when the human reaches Freud's "uncanny valley" and though the robots seem real, they ultimately are not real and cannot provide the exact same relationships as a human. The negatives are mainly moral and social, however, from an economic point of view, I would say there are many positives. Thinking of the labor force – it could be supplemented by robots and income could be generated for companies and nations and humans could focus on other aspects of society or individual needs and wants. I think of universal basic income that is present in places like Qatar and was recently suggested in the US by former presidential candidate Andrew Yang. Humanoid robots can learn how to become accountants, surgeons, consultants, engineers etc.

As aforementioned, this technology is prevalent in nations like Japan and there are many studies currently under way when it comes to the sociological and psychological impacts of being in contact with humanoid robots. We see how dependent people can become on operating systems and cell phones, it could be said that this would occur if a robot lived with someone or worked with someone. It will be interesting to see the morality and ethics of employment and how these robots are treated if they were to join the workforce – would they get overtime pay? would they be paid at all?

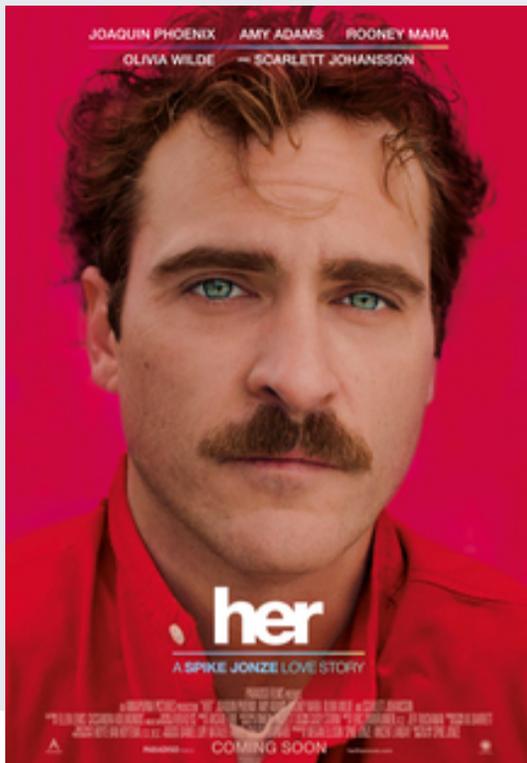
Also, worth mentioning – when it comes to science fiction becoming science fact, do we thank authors and directors for perhaps giving ideas to those that have the technological knowledge and means to execute the ideas? I'm thinking now how films may push innovation forward and Hollywood directors and science fiction authors have been seldom credited over the years as technology advancers. A big "thank you" may be necessary for the Stanley Kubricks and Stanislaw Lems of the time.

Reviewed by

Monica Spychala

USA / Germany





Her

Genre: **Drama, Romance, Sci-Fi**

Director: **Spike Jonze**

Starring: **Joaquin Phoenix, Amy Adams, Scarlett Johansson**

Year: **2013**

IMDb: **8.0/10**

The film takes place in the nearest future, where people are surrounded by the widespread use of high technologies - advanced voice assistants, smart home systems, and voice control of devices. Joaquin Phoenix stars as Theodore, a middle-aged man who works for a greeting card company and is going through a painful divorce. One day, Theodore noticed an advertisement on the street for a new product - an artificial intelligence-based operating system that can hear and understand you. Out of curiosity, Theodore decides to purchase this product and the main drama of the film begins here.

Samantha (the name given to the operation system of the main character) can see the world around it (using a camera like in one's phone), has an access to the Theodore's mail (with his permission), and is able to perform a number of actions: to send letters, to communicate with other people and systems, etc. But most importantly, it possesses three very important human qualities: "self-awareness" (she knows that she is an operating system), "intuition" (she can read between the lines, understand the context and recognize lies), and "feel" (she can rejoice, get angry and jealous).

After some time Theodore and Samantha get a rather serious affair, which helped the main character's to recover from his depression and to some extent to overcome the divorce process. It is worth mentioning that other people (friends, acquaintances, and just passers-by) also use similiar operating systems. Once a Theodore's colleague called him on a double date and he was not surprised when found out that the "girl" of the main character is an operating system.

The key thing that was demonstrated in the film is the fight against loneliness. This problem is quite acute nowadays and it has many reasons: social networks, awareness of young people, declining birth rates, etc. With the help of the technology presented in the film people could find their ideal companions. In addition, it can help solving simple but time-consuming tasks: deep sorting of mail, monitoring and scheduling appointments, choosing gifts, etc. So, as for the possible positive applications of the technology, I see two main aspects - a more global delegation of daily household tasks, as to a personal advanced secretary; and the use of a specially trained system for working with people with mental disorders - both for therapy and for diagnosis.

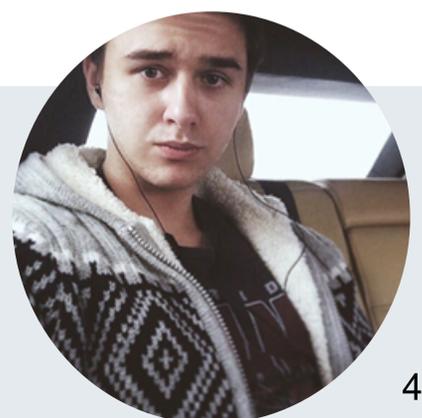
Considering the negative consequences of this technology, first of all, I want to return to the film and draw attention to the fact that this system was able to manipulate Theodore and depict the manner of speech and tone of voice she needed. With this in mind, some people can lose control of themselves and become a kind of puppet in the hands of artificial intelligence. In addition, in the film, the system was able to communicate with other operating systems and even create new ones, which in turn could create a great threat to all the humanity (in case of aggressive motives).

For the moment, it seems like no existing operating system is comparatively close to Samantha, presented in the movie. But, if we will think about it as an ecosystem of different AI-based apps (voice support, machine-learning technologies in office applications, and so on), then it might be pretty realistic in the nearest future. Considering a trend of creating whole ecosystems of different software solutions for companies, one day Microsoft or Apple might develop their Siri- or Cortana-based Samanthas.

Reviewed by

Vladislav Savchenkov

Russia





Guest from the Future

Genre: **Sci-Fi**

Director: **Pavel Arsenov**

Starring: **Natalya Guseva, Aleksei Fomkin, Ilya Naumov**

Year: **1982**

IMDb: **8.2/10**

The core technology presented in the film is a mind reader. In this series, as in several books by Kir Bulychev, it is called a myelophone. This device is divided into two parts: a - large transparent crystal, that consists of several glass particles, b - black case. Each of these elements has its purpose. The crystal itself is responsible for the process of mind reading, while the main task of the case is to protect it. Transmission of information through the channel Receiver - Transmitter is symbolized by iridescent shades and particular sounds. It is quite easy to use. Moreover, myelophone is portable and it works without charging.

Myelophone was developed in the laboratory of Professor Seleznev, the father of the main character Alice. It was produced mainly for the two purposes. First, it is useful for scientific research, i.e. for conducting several experiments and verification of results. Secondly, this device can be used for medical reasons: the myelophone allows accurate diagnosis when a person has difficulty in formulating thoughts. In the series, Alice mainly demonstrates the spectrum of its applications. For example, the second episode represents the experiments on the mind-reading of the crocodile Seni in KosmoZoo. The sole requirement for its operation is the presence of thoughts in the head of the animal.

The indicated features of myelophone and the approaches to its use have both positive and negative effects. Certain effects were mentioned in the film, and some of them are inferred from the device parameters. There several beneficial effects associated with this item:

1a. Improved awareness of brain processes (can be used to improve healthcare). The device has the ability to detect biological currents in the brain of a living creature and transmit this data.

2b. Tracking other people's thoughts (can be used to reduce the number of crimes).

3c. Verification of any statements made by a person (can be used to increase the level of trust in society). This device gives an opportunity to check whether the thoughts and the words are in line, so there will be less chances to lie.

Nevertheless, this freedom has also several negative consequences:

2a. Low availability of the technology (which might result in the increase of the crime rate). This device consists of rare materials, so its use leads to increased interest from thieves. This situation is presented in the movie itself.

2b. Unauthorized mind-reading (which might result in the inconsistency between the established "moral norms" and the desire to get sensitive information). In society, it is initially accepted not to break personal borders, but this item has an opportunity to cross this line.

This device impresses and raises the question - "Is it possible to create this kind of gadget in real life?". Two models of similar technologies are easy to identify even nowadays. The first analog of the device is a well-known polygraph ("lie detector"). It has a more limited set of functions compared to myelophone, as it distinguishes only true and false statements. Nevertheless, the principle of operation partially coincides: it is based on measuring changes in physiological processes. The second device is microchips for connecting the brain to the computer, developed by Neuralink. The American neurotechnology company, founded by Ilon Mask, is specialized in the improvement of the treatment of a range of diseases through tracking brain signals. At present, the device has been tested on pigs. So maybe a real myelophone can be produced in the nearest future?

Reviewed by
Alexandra Semikrasova

Russia





Empathy, Inc.

Genre: **Drama, Sci-Fi**

Director: **Yedidya Gorsetman**

Starring: **Zack Robidas, Kathy Searle, Jay Klaitz**

Year: **2018**

IMDb: **5.2/10**

The movie tells a story about a man (Joel) who decided - without any prior investigation - to invest in an organization developing a breakthrough and mysterious technology. It is the helmets for 2 people, and when used together they allow one mind to appear in the body of another person (just like in the movie Heart of a Dog (1988)). The helmets are managed by a software that drives the process. It also monitors health conditions and collects biological data such as DNA of users. More important is that both users are given access to memories of each other. So they can understand the personality of the body owner and thus easily copy his or her habits.

The main positive effect of this technology is that it gives an extraordinary experience to the user. For example, the effect of non-caring about your body sends the large stream of confidence, which in a reasonable amount of sessions can give people with mental disorders real feeling of being an average person and improve their healing. Conflicting couples can improve their relations or at least arrange peaceful consensus by switching bodies and investigating the reason of their misunderstanding in that way.

Nevertheless, it is a thriller movie, so usage of this technology has negative effects and they can be tragic. There were accidents when some people who switched their body with someone else could not resist committing a crime because of the wish to play with a stranger's physical abilities. This can happen if the process is not controlled by the third person properly, which in the movie led to situations when the tested people got into jail for the crime committed by a different person. Also

excitement of the process can lead to the addiction that worsens the risks even more. That is why restrictions on the conditions and the number of sessions should be introduced in case of implementation.

In reality, research and experiments (mostly, in Neuroscience) were made to bring the illusion of a similar effect. For example, in the Swedish medical university Karolinska Institutet (KI) neuroscientists managed to swap bodies between real people and dolls. The thing is that human being connected to the doll could sense tangibility through it (Tacikowski, 2020). Also, an opportunity to connect bodies through software surely follows the idea of integrating human mind out of the body into another object (e. g. Brain chipping). This technology is invented and experimented for possibilities to control animals (rats) and robot AI by power of thought.

Reviewed by

De Khyn De

Russia





Upload

Genre: **Sci-fi comedy series**

Director: **Greg Daniels**

Starring: **Robbie Amell, Andy Allo, Zainab Johnson**

Year: **2020**

IMDb: **8.0/10**

The core technology illustrated in this series is a device integrating neurotechnologies, virtual reality and advanced IT infrastructures. It is invented to collect human's consciousness and "upload" it to the virtual reality world after people die, in order to allow them to survive "mentally".

The virtual world is avatar-based and the environment setting just looks like the real life on earth. Basically, a person can "choose" his afterlife after his body physically died. The choices of the afterlife setting are super extensive: users can choose their avatars, body shapes, cloths, food, rooms, cars, gardens, swimming pools, etc., but only if they have enough money to buy extra gigabytes of data. In general, you can customize your "heaven" if you are rich enough. Poor people can only be uploaded to an deserted virtual world, living in a small room with only white walls, or do not even have a chance to be upload at all and have to be "mortal".

Living people can communicate with those who are already physically dead as long as they are uploaded on time after they die, say, within two hours of their biological death. The living can easily check what their dead loved ones are doing in real time. This may sounds weird. But not only this, the living and the "dead" can even have physical interactions, e.g., feeling, touching, walking with each other, doing massage, etc., through VR suit and wearable devices. They can feel no difference before and after the death of the loved ones – except now as living people, they need to wear a thick VR suit to meet the dead ones in the virtual world.

The technology presented in the serial would be one of those human's most great

achievements – they create a heaven using their intelligence. They break the bridge between living and death, separate the mind and body, extend the biological and physical limit, and ease the pain from departure of beloved ones. Besides these, a potential advantage of this technology could be the storage of great minds of human beings. Imagine if we could have saved Einstein’s mind, or Newton’s, the progress of natural science would be considerably accelerated (or not?).

Although some disadvantages can be seen in economic, social and ethical sense. As shown in the serial, the afterlife business is forming a new industry, which have great impact to the economy of the livings. When people know immortality is possible and start making money for afterlife, all the rules, principles can be changed. Even worse, maybe all the discoveries in social sciences could change because one of the original setting of human mind and behavior which lasts for thousands of years has changed. Besides, the gap between the rich and the poor would be enlarged and more serious social conflict can arise as “the rich can be immortal while the poor cannot”. Moreover, ethical dilemma is also a problem which is hard to ignore. Can people’s body be separated from their mind? Should a person live forever? Will he still cherish his life while he is still living, given that he knows he will have an afterlife?

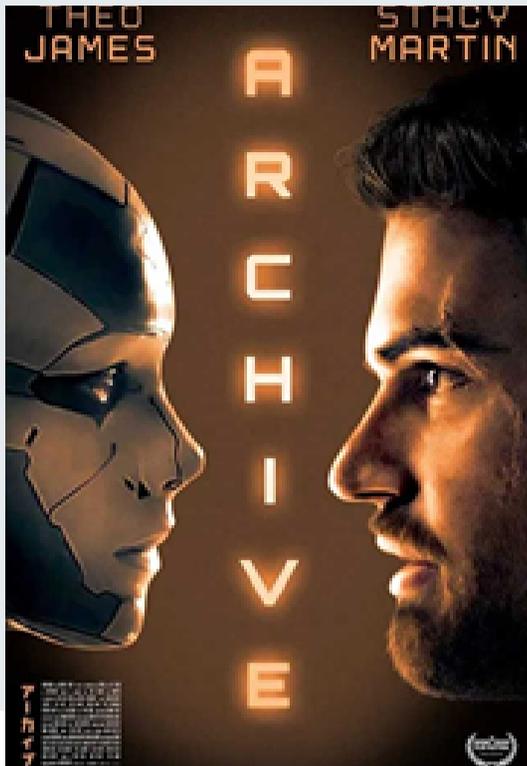
The possibility if such uploading device can be realized depends on the progress of several embedded technologies. Two of them are the neuro interface and VR technology. In terms of status quo of the former, so far the possibility to “collect” and “transfer” human consciousness remains low. We have not found a way to transcript brain wave and other neuro signals, let alone convert and translate the neuro waves to consciousness. Russia Avatar 2045 Project is taking effort to realizing what is shown in Upload. As demonstrated in its ambitious plan, by 2020-2025, it planned to successfully create an Avatar in which a human brain is transplanted at the end of one’s life. But obviously, it’s not even close. Recently Elon Musk’s neurolink project is also widely criticized. The experiment on the pig is still far from getting any indication about human brain. In terms of VR, the most popular field of development is games, videos and other segments in entertainment industry, instead of applications in healthcare and other life sciences.

Reviewed by

Xiaoqian Zhang

China





Archive

Genre: **Sci-Fi**

Director: **Gavin Rothery**

Starring: **Theo James, Stacy Martin**

Year: **2020**

IMDb: **6.3/10**

The movie describes the nearest future, 2046 year, when humanity has already made a quantum leap in technology. New discoveries are only a steppingstone for even greater experimental achievements, which is what the main character of this story, the talented young scientist George Elmore, is going to take advantage of. Secluded in a remote laboratory, Elmore, using existing technologies and his talent as an inventor, tries to create a truly "living" robot that can replace his deceased wife.

On the days of George, there is already a technology that allows one to store all the memories of real people in the form of an archive, which then, after the death of a person, can be used to recreate the way of his or her thinking and feeling. So, after the death of his wife, George decides to build a robot capable of performing all human everyday functions, and most importantly, of analyzing information and making decisions in the way a real person does. Three prototypes were built - the first was a fairly primitive robot, unable to speak and able to analyze information at the level of a 5-year-old child. The second robot was more advanced, could run and talk, process data like a 15-year-old teenager. And the third prototype already had shapes and sizes similar to a real person who can think like an independent adult.

Such a combination of an artificial intelligence and the iron "body" of a robot potentially can perform many roles and tasks: starting from the functions of a housewife to those of a rescuer, working at complex and dangerous objects in a high-risk area. It can be an assistant in any work, taking on routine tasks, etc. The scope of application is extremely broad. But despite all the advantages of robots,

they are nevertheless not capable of replacing humans. The ability to distinguish between the good and the evil, to apply creative thinking, to convey beauty is not peculiar to them. In addition, the need for a large amount of energy to control them, the difficulty in repair and maintenance are also their disadvantages.

The AI-based technology presented in the film might seem unrealistic, but even now there's an active debate on the ethics of using AI (Tasioulas, 2019; Winfield & Jirotko, 2018; Lin, Abney & Jenkins, 2017). Due to the fact that the technology is already quite well developed, and society is very positive about the use of robots with artificial intelligence, it is not yet clear who will be responsible for the potential negative risks. If a robot becomes conscious and takes responsibility for decision making instead of a human, in long-term perspective there might a danger arise of losing control of the resources or nature. Moreover, human values such as loyalty, empathy, trust are not inherent in robots.

Despite the potential risks, countries are setting ambitious goals for the widespread use of AI technologies. Thus, we can expect a gradual penetration of artificial intelligence into our daily life. However, it is important to remember that the technology must be used carefully, and we should not allow a complete replacement of human mental activity.

Reviewed by

Tatiana Solovieva

Russia / Germany





The Game Changers

Genre: **Documentary**

Director: **Louie Psihoyos**

Starring: **James Wilks, Arnold Schwarzenegger, Patrik Baboumian**

Year: **2018**

IMDb: **7.9/10**

The film is focusing on the dietary impact of plant-based diet on the human health. It provides many arguments in favor of dietary shift from being an omnivorous to vegetarian/vegan lifestyle. There was a small research presented in the film. Three healthy males were given a dinner for two days in a row. The first dinner consisted of high-quality organic meat (chicken burrito). The burrito for the second dinner was vegan and made of plant-based meat. Every night a health indicator was measured by researchers by using a special medical equipment placed on the upper part of left leg. The equipment controlled the duration and intensity of erection during nights. The finding was the longer duration (+300-500%) of erection during the night after plant-based dinner and higher intensity of it (+8-13%). Although the experiment had not been conducted in line with all common research principles, it raised the question of impact of plant-based meat alternatives consumption on the human body.

The core technology in the center of the experiment was plant-based meat. Tziva et al. (2020) describe the supply chain of plant-based meat analogs in several steps. Firstly, different protein crops are cultivated worldwide. Then crops are supplied and processed into protein ingredients named protein concentrates and isolates. In the third step, the processed ingredients are purchased by food companies and processed again to obtain texturized products, which are called TVP. Then the final products based on the textured proteins are developed. Those final products have a form of traditional meat products usually consumed – patties, fillet, mince, etc.

The first generation of meat analogs appeared in Europe at the beginning of the 1990s and was mainly based on TVP products. The second generation is based on

the shift of technology from low extrusion to high-moisture cooking extrusion and adapting processes from other food sectors such as the utilization of hydrocolloids. Those advancements improved the taste, texture, and appearance of the products and allowed them to use a broader range of crops as raw materials. The main advantage of the second generation high moisture extrusion was higher fiber formations that replicated meat structure closer and were performed better in terms of taste (Riaz, 2011).

One recent clinical study (August 2020) confirms the positive impact on health illustrated in the film. The researchers examined how consumption of plant-based meat alternatives affects human health (Crimarco et al., 2020). They revealed that the levels of trimethylamine N-oxide - which is a risk indicator linked to cardiovascular diseases - had lower measures for those participants of their experiment which were eating plant-based meat. Besides, another health effect was found. The participants from the group of plant-based meat eaters lost 2 pounds each on average.

A common finding in the literature is plant-based meat alternatives consumption has also positive environmental impact. The main environmental benefits found in research are more effective exploitation of economic resources, global warming and environmental pollution reduction, more favorable other indicators measuring environmental impacts of plant-based versus conventional diets.

The negative impacts of plant-based meat production were not confirmed. However, such stakeholders as livestock farmers and meat producers are negatively affected by the raise of plant-based meat production in the world. As per FAO, the global meat production volume exceeded 300 million tons in 2018. It is an essential business activity not only for local producers but for multinational corporations. No doubts, the attitude of this stakeholder group toward the dietary shift is negative due to the potential loose of the important meat market. However, the disruptive nature of innovative products always affects value chains of such parties. So the future of the technology seems extremely promising given the global environmental concern and growing consumption of healthier food products.

Reviewed by

Georgii Zheleznyi

Russia / Germany



Her

Genre: **Drama, Romance, Sci-Fi**

Director: **Spike Jonze**

Starring: **Joaquin Phoenix, Amy Adams, Scarlett Johansson**

Year: **2013**

IMDb: **8.0/10**

The movie starts with Joaquin Phoenix, playing Theodore making a bold declaration of eternal love to an unseen soul mate. He does it with such a sincerity and unaffectedness that one almost feels uncomfortable until one understands that the declaration is not his own, but for something he does for a job. Theodore works in a big company specialized in writing personal letters to people, on behalf of their friends, family and loved ones. This hints us about the nature of society in the film, that it is devoid of any personal connections, so much intertwined with technology - society where people rely on companies to build personal connection for themselves. Theodore's life is so similar to the 2013's era humans, checking emails on metro rides to work, replying to them, staying abreast with the news, etc. Wireless earphones, voice command assistants, everyone looking for love or forms of it online, devoid of any personal human touch. All this does not seem so different to us, just 7 years into the future.

Life of Theodore changes when he discovers OS 1, an Artificial Intelligence system which is designed to listen, understand and know you. Upon his first interactions with the software, it asks Theodore for some initial questions. While listening to his answers, it can sense emotions in his voice, his relationship with his loved ones - even before he can complete his answer.

Theodore chooses to give his digital companion a female voice, named Samantha (voiced by Scarlett Johansson). It is interesting to note how natural and original this OS 1 sounds and thinks like. Theodore, skeptical at first, finds it weird as to how just a sound in a computer can sound so like a person. "I can understand how a

limited perspective of an un-artificial mind would perceive it that way,” - Samantha exclaims, highlighting her ability to process tons of information, evolving through experiences and making connections.

This technology becomes such a big part of the Theodore’s life in a short span of time: it evolves according to Theodore, having conversations about his divorce, behaving like his partner and companion. The technology seems to learn from humans as much as humans benefit from the technology. Samantha has such a striking influence on Theodore: on one hand, he is happier than ever to find a companion whom he can talk to, but on the other hand, it detaches him from the actual world.

Theodore’s friend, Amy has also discovered this AI OS system, and she explains how he is not the only one. This makes him realize that relationships can be complex: it is different, but it does not mean it’s not real. This changes his perspective on Samantha from seeing it as a weird relationship to actually realizing this may be the new normal. The whole experience with Samantha makes him move on with his divorce and finally make it official after so much time being non-committal. The rest of the movie shows us how Samantha and Theodore, develops their relationship and starts living “together”.

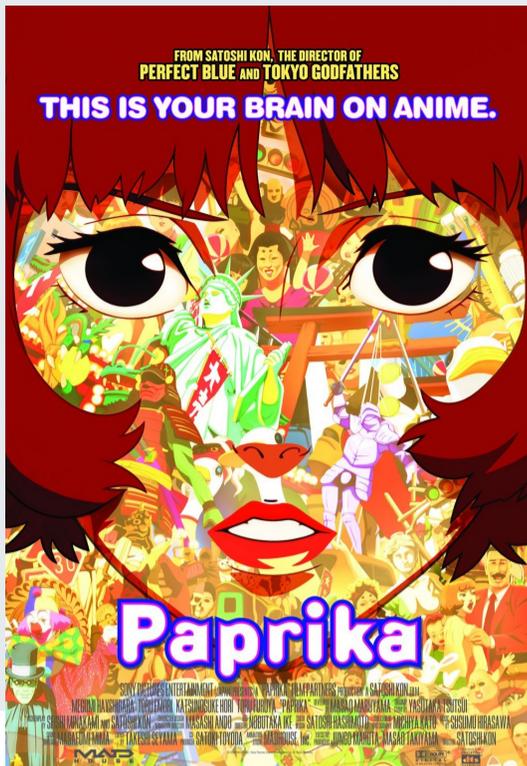
The movie was understandably considered as a sci-fi in 2013, but in 2020 we might be living more parts of the movie that we would like to. AI based operating systems like Siri and Alexa are already at levels of performance shown in the movie. The speech and connection are still not there mainly because of privacy concerns but the technology does not seem far fetched in current times. Director Jorze showed the connection with the technology with such an ease that it does not seem out of place like Star Trek and the likes. The technology is here, the people are behaving in a similar manner, avoiding personal relationships and lacking connect. Bottom line is, the movie is beautiful and in 2020 shows us how far we have come, and how we have changed for the better or for the worse is for the viewer to decide.

Reviewed by

Vaibhav Jain

India





Paprika

Genre: **Animation, Drama, Sci-Fi**

Director: **Satoshi Kon**

Starring: **Megumi Hayashibara
Toru Emori, Katsunosuke Hori, Toru
Furuya**

Year: **2016**

IMDb: **7.7/10**

I would like to describe and shortly analyze the Paprika movie which is based on some psychological aspects of people. Particularly, it is about the night dreams. In film, the treatment of people is conducted by a special device called Paprika, that can penetrate in people's night dreams, detect the key scenes there, produce the overall video and pictures and thereby help people to find the concealed answers to some real life questions.

Night dreams are the reflection of the person's concerns, feelings, and emotional state. They are magic, remarkable, irrational, and extraordinary. And the idea to treat people's psychological problems through their dreams seems to be an interesting and suitable approach which might help to overcome the difficulties in the real life and to achieve good, optimized emotional state and satisfaction. That is the obvious positive effect of this new technology presented in the film. People are not able to process the information during their night dreams, and the Paprika is useful here.

I would say that this technology can soon be implemented, it seems to be feasible in the future (not exactly the way it is in the movie, but the idea itself has awakened the interest). Devices that can control our night dreams already exist, but they are still not so accurate. People can manage their state in their dreams and influence that. An example here could be the Dormio device. Dormio is not able to delve night dreams so far, but Adam Horowitz from MIT continues to advance this device, along with creating more dream-tracking and dream-hacking devices. The document "Incubating Dreams" shows some experiments conducted by Adam Horowitz and indicated the obtained results. Also some devices nowadays can optimize sleeping

process and stimulate dreams in different phases (Aladdin device and App, Licud Dreamer device).

Besides other points, the movie Paprika points out how new devices, smartphones and Internet influence our perception of the real world. Due to the existence of these things and the emergence of new ones we see the world from different perspectives. Along with positive effects of new devices, people have to keep an eye on their side effects and possible risks of emerging technologies, to control all the aspects of the scientific progress, in order to prevent the world from unforeseen situations.

Reviewed by

Daiana Dugarova

Russia / Germany





Titan A.E.

Genre: **Drama, Sci-Fi**

Director: **Don Bluth, Gary Goldman**

Starring: **Matt Damon, Drew Barrymore, Bill Pullman**

Year: **2000**

IMDb: **6.6/10**

This movie is a cartoon story about a venture of a human group to find a giant ship Titan that can significantly improve people's life after the Earth destruction. The technology at the core of the film is a large spaceship that can construct a planet with the Earth life conditions such as water and oxygen. The object is in a shape of a large ball that is designed to collect space materials to create a big body of a planet size, and it should become the center of a future clone of the Earth.

With a help of the Titan, humanity will get an opportunity to easier travel in space, to have a new shelter. It could free people from the large moral responsibility for nature protection. When coming to a new territory, they can rule the world without any concern about intervention to the lifecycle of wild animals and plants.

On the limitations side, the Titan needs a large amount of energy which is comparable to the power of a nuclear bomb able to destroy the planet. The villain of the story is an aggressive race Dreji whose weapon wiped out the Earth. After finding the Titan they tried to repeat this action, but the ship consumed all the energy and used it backwards by beginning the process of the terrestrial formation. So the film makes us assume that if there is a nuclear source of energy, sufficient for the destruction of an entire planet, then it can also be used to build a new one, given that some advanced technologies are already at hand.

The Titan seems to be an extremely unrealistic set of technologies, but the way it can help people in finding a new home is actively discussed in mass media. For example, the Popular Mechanics compares the given method to the building of a

large space station like Death Star in Star Wars. The authors conclude that the option with building a planet from a scratch (if possible) would be superior to the second option based on the gravity constant maintenance and consumption of resources less natural for Terrans. Also this strategy could give a rise to a new natural ecosystem by using the Sun-like mechanisms .

For some obvious reasons, it seems like no real research as ambitious as the fantasy of the film directors, is under way nowadays. Although, there are many initiatives to find other planets whose conditions would resemble the Earth. For example, S. Jacobson simulated the terrestrial planet formation to then find some in the universe.

Reviewed by

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