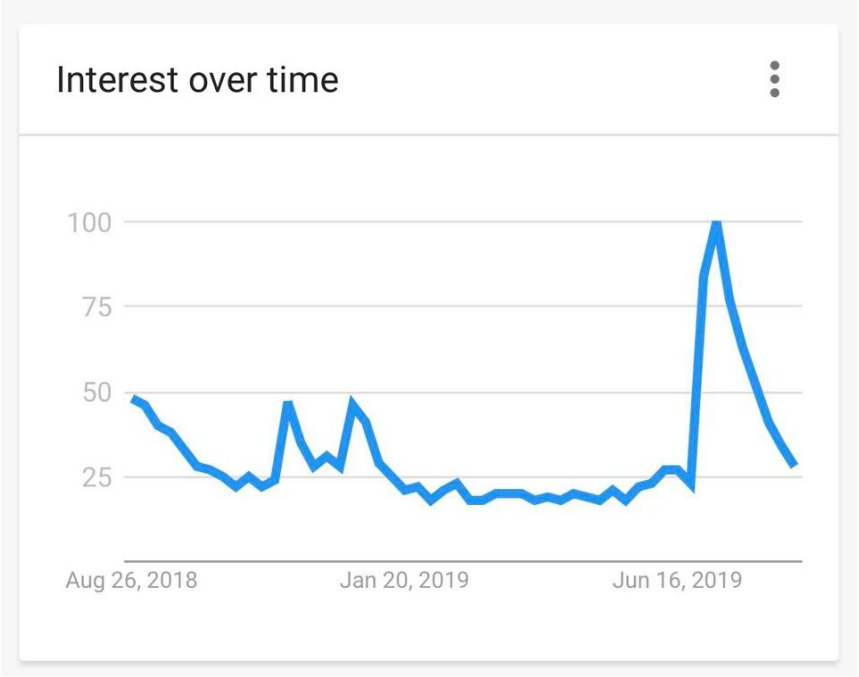
Humanoid robot appearance as a way of its social integration (inspired by Detroit: Become Human)

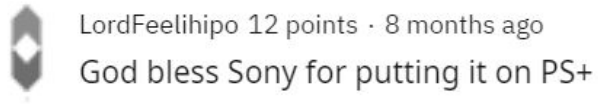
> "*These were robots in human form with distorted faces, and they gave my daughter nightmares. When I asked her why she was frightened of the Cybermen but not of the Daleks, she replied that the Cybermen looked like terrible human beings, whereas the Daleks were just Daleks.*"
>
> — Ann Lawrence, writer for The Morning Star on Doctor Who: The Tomb of the Cybermen

Detroit: Become Human is a game developed by the French company Quantic Dreams for the Sony PS4 gaming console, which received an action-adventure title with a cinematic aspect in 2018. After a while, the game was ported to the PC platform by June 2019. It is no exaggeration to say that this was her second breath.



Taken from https://www.reddit.com/r/DetroitBecomeHuman/comments/cukjm4/detroit_become_human_popularity_from_last_year_to/

Besides, Sony decided to share free copy of DBH with gamers according to LordFeelihipo user's note in comments on Reddit r/Detroit: Become Human.



Two years ago, I missed the hype associated with the increased popularity of this game, but a few days ago I successfully finished watching the latest episode on YouTube, spontaneously discovering dozens of different endings of the stories of the three main characters. Today, I'd like to talk about an issue that has been in my head ever since I fully focused on what was happening on the screen. Even though the gamer/observer's attention was almost entirely focused on the dramatic aspect of the picture, I was actually most grateful to the developers for the incredible amount of allusions, inspiration, and priceless thoughts that this game conveys in a kind of unobtrusive manner: it's about AI, fundamental questions and problems that I dare say we don't really know how to solve to this day.

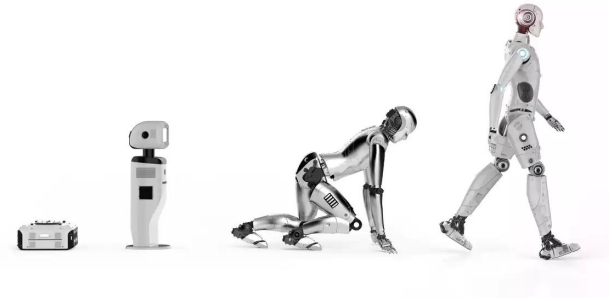
One of the covers of Detroit: Become Human game with the main character - android-detective named Connor. Only the presence of an LED indicator on the temporal part of the face let us distinguish androids from the people.

Note: This is the first article in a series of articles on ideas, thoughts and just notes, which I was inspired and inspired to write by Detroit: Become Human. All articles in this series will be available by detroit tag on my website. Have a nice reading time, I hope this brief analysis will be food for your mind!

People of the Detroit: Become Human world have a whole bunch of social problems mostly reflecting the fears the real world people, which is not accidental - one of the main themes of the game is the problem of xenophobia, provoked by fears, panic and anger of the human race, leading to a serious in-game conflict between the two races of creatures in the course of the narrative. Typical problems that find their place both in scientific conferences and argues on Robotics around the world and in the pages of science fiction books, also worry people of DBH: the vanishing of archaic professions, job cuts, where a robot or other automated device can replace manual labor, the successful and effective closure of social and economic needs, but most of all - the issue of "otherness" of people and androids on the model of the world perception. In the process of passing the game there are a lot of pressing questions, sometimes of a philosophical nature. Androids, despite all their distinctive qualities from biological beings, such as absolute rationality, lack of empathy and complete obedience, bring a huge resonance in the society of reasonable people. They consider themselves masters of androids, human-like, barely distinguishable intelligent creatures created by some CyberLife corporation in a world still filled with the same problems we face watching TV or, unfortunately, experiencing them in our own experience.

Practically indistinguishable from people (only specificity of some elements of mimicry, characteristic manner of dialogue and physically stitched in the right temporal part of the face chip with LED indicator can make it clear that it’s not a human), androids evoke in people a sense of deception, jealousy and, perhaps, their own unnecessity - it is worth to look at the flawlessness of the work performed by androids, both strictly routine and special, where human shows himself a few orders of magnitude worse, if not useless. As a human's self-confidence as a

unique intelligent being capable of erecting megacities and colonizing other planets, is rapidly disappearing, giving way to fear of the future of its biological species and retreat to the possibility of passing the lead to the artificial intelligence.



Do we imitate the evolutionary process by creating our electronic brainchild, or do we simply come to the point where human-like bipedalism and anatomy is the most optimal option for the sentient being comfortable existence?

Let's take a step back and still ask ourselves the question: why do we make humanoid, in other words androids in real life, and why does the society of people from the game of interactive cinema genre Detroit: Become Human continues to create such robots, ignoring the demonstrations of dissatisfied people and all-piercing dislike and frustration for androids?

In the world of Detroit: Become Human in buses androids has a separate compartment. Most likely, the purpose is not to embarrass people in the cabin or to provide passengers with a sense of safety.

Why it is impossible to create the robots which do not resemble externally the person, do not possess anatomic, behavioural similarities and a similar way of thinking, but possess the physical and intellectual abilities necessary for the most effective basic application activity for particular model of the robot (i.e. adjustment of appearance of the robot under its function without paying attention to unnecessary complexities at a design stage)?

First of all, it is worth having a basic understanding of android as a special approach to the development of robotic systems. A humanoid robot is a robot whose body structures are designed, developed and implemented to resemble the anatomical structure of the human body. This design can be a response to functional needs, such as the interaction with tools made for human beings and with environments that are comfortable for humans, for experimental purposes such as the study of bipedalism - the motor activity of moving on a solid surface using two paired limbs, or for other scientific purposes. Generally speaking, a humanoid robot typically consists of the torso, head, a pair of arms, and a pair of legs, although some forms of humanoid robots can only simulate one more general body part, such as the whole one above the waist. It is worth noting humanoid robots that also have faces designed to mimic human features, such as eyes and mouth.

The authors of popular science and fiction books for many years used the term android in a much wider range of possible interpretations than a robot or cyborg. In some works, the only difference between a robot and an android is their appearance, where androids look like humans on the outside and internal mechanics look like robots. In other stories, the authors used the word "android", meaning a completely organic but artificial creation. Other fictional images of androids fall somewhere between them.

Eric G. Wilson, who defines androids as "a synthetic human being", distinguishes three types of androids based on their body composition:

- Mummies - androids are made of 'dead things' or 'hard, inanimate, natural material', such as mummies, dolls and statues.
- Golems - androids made of flexible, possibly organic material such as golems and homunculi.
- Machines - androids, which are a mixture of dead and living parts.

Although human morphology is not necessarily an ideal form for working robots, a passion for developing robots that can emulate it can be found historically in the assimilation of two concepts: simulacra (devices that exhibit similarities) and automata (devices that have independence).

Let's reformulate the question - why can't we create more efficient and suitable inhumanoid robots for specific activities?

Why did we initially need to create exactly humanoid robots, androids capable of imitating human behavior so thoroughly, including honed facial muscles, fine motor skills, excellent, indistinguishable, "bipedal" feature of movement? Couldn't robots be circumvented by having no basis in the conceptual aspects of the structure of both humans and other biological beings?

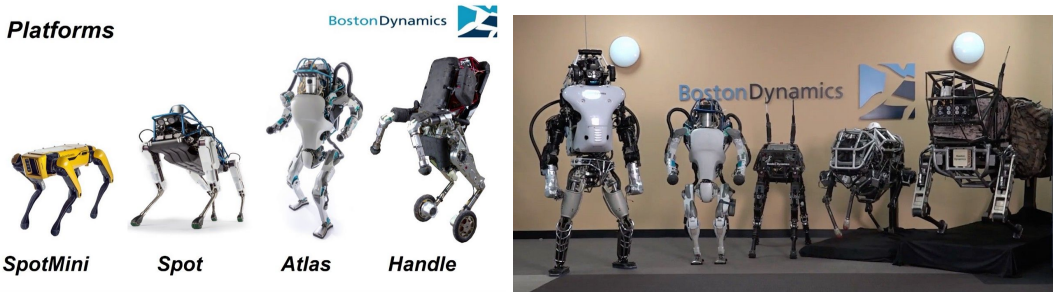
1. Human "two-legged" and anatomy of limbs in general, weight distribution are in principle ones of the most convenient types of locomotion, a way to move in space to meet any needs. The course of evolution has proved this by moving one of the branches of apes from which we have emerged to a higher stage of development. In addition, there is evidence that the absence of the thumb on the hand would not allow us to achieve such an intellectual lift (the thumb plays a special role, allowing us to create pressure directed against other fingers, which is the basis of the grasping function of the hand, and therefore can play a role of the grip for tools, the first messengers of progress). Another thing is that evolution is not a

neglected, strictly directed process, which has only one "true" path of development. Evolution is a natural phenomenon that defines only the intuitive property of the organic universe, which consists in the survival of a more adapted specimen of a certain species, which is only a part that sets the direction of the general course of evolutionary selection (unless, of course, we follow the amazing theory of the "selfish gene" by the authorship of the respected Richard Dawkins, an English ethologist and evolutionary biologist, considering the evolutionary process of genes rather than individual species and individuals). Thus, it is possible to assume, that being so perfect in relation to other inhabitants of the earth, the human being is only one of many possible developments, and there is a great chance, that there could be such a version of race of people or absolutely other kind of biological being, possessing other physical structure of a body, biological, chemical and physical processes occurring in it - and at the same time much more suitable for our habitual environment. Another thing is that for us (as well as for people from the near future, where the DBH game is unfolding, for sure) it is difficult to imagine another "configuration" of a human being, which will allow us to raise the following moral, philosophical and social-ethical question: do we have the right and sense, or, the most important, how can we introduce such a creature into society without fear of extreme xenophobia from people side?

The reason we are more likely to build human-like robots than robots similar to animals in terms of structure and mode of movement is perhaps because we want our robots to perform effectively not only in natural habitats, but also in environments designed for humans, such as densely populated metropolitan areas (hello, Detroit!). We create robots by designing them so that they are best suited to the world created by humans.

Humans are animals, and we operate according to the properties of our bodies. The prehistoric world shaped us. Natural selection

favoured our limbs, eyes, hands and even our sense of direction over long-extinct competitors.



Boston Dynamics, a well-known company specializing in the design and manufacture of robots for various government services and other institutions, has been experimenting with the anatomy of the robots it develops throughout its existence.

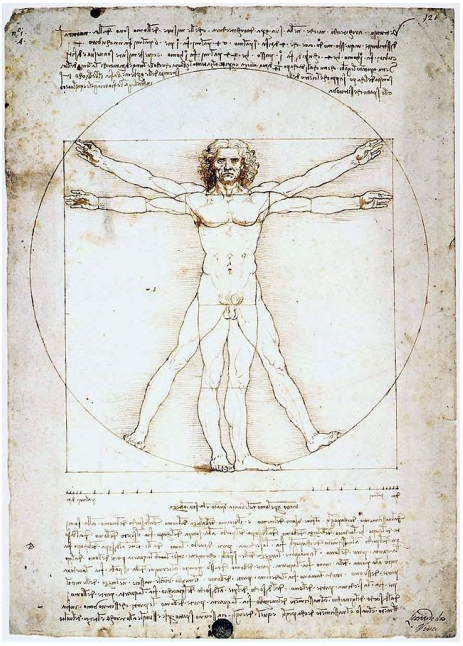
2. Another idea is that a human being is more difficult to adapt, to push to an adequate, neutral perception of a creature with abnormal, to his/her mind, physical structure, and even in addition to being not a biological creature. In the DBH, androids play the roles of nannies, nurses, volunteers, doctors, and somewhere even the role of mother or father, so the appearance and behavioral features of robots of such professions should be as much as possible consistent with the expected behavior of a human being for successful social integration. On the other hand, the authorities in the field of robotics and related disciplines come to idea that it is not yet clear whether this is a social or an evolutionary feature of human negative reaction in relation to creatures strongly resembling the human being himself, but still clearly different from him, since the tested infants up to a year, according to the results of the study, do not show any special propensity for this phenomenon (research by David J. Lewkowicz and Asif A. Ghazanfar). Thus, although the scientific community is inclined to our evolutionary biological features of psychological perception (in particular, the question of the predictive abilities of our "Bayesian" brain capable of quickly and accurately sifting out unlikely events), perceptual experience with real human faces is crucial for its emergence. In summary, it may be said for sure that it is much

more time-consuming and irrational to adapt robotic assistants responsible for socially important aspects to an inhumanoid appearance. Such job for robots as medicine and the care of sick people which require an understanding and emotional response from the caregiver, require an appealing in terms of biology, human-like appearance . It is easier to bring the robot's physical body into a structural form that will give the most positive sensual, empathic response from a human being than to carry out a quite long process of social reform, propaganda and such a slow spread of the idea of respect for the rights of robots (whether they are the property of people or independent, conscious beings) in lagging countries.

3. "*We like to anthropomorphize. We are the only species who do. We like to invent objects like us.*"

4. Ben Russel, Leas curator of "Robots"

Since ancient times, mankind has tended to depict and immortalize itself in art and science (starting with ancient rock paintings depicting jubilant hunters standing on a mammoth defeated during a hunt), and over the last two centuries has been inclined to the idea of creating humanoid robots. From my point of view, it can be a kind of an act of pride, a consequence of the inadvertent development of the idea of anthropocentrism, to the reckless and naive, in my opinion, thinking that we, as biological beings, have a major position in the universe at the expense of such a unique structure of the body that allows us to operate with tools, to lift huge cities with developed infrastructure literally from dust, earth and mud. Sometimes theories about the "perfect" proportions of our body are mixed up here, the beginnings of which were derived by ancient scientists, engineers and thinkers, such as Leonardo da Vinci and his "Vitruvian Man".



Leonardo’s famous work - Vitruvian Man.

5. As soon as the appearance of robots crosses the border "almost human, but clearly not quite" and becomes indistinguishable to the naked eye of man from their counterparts, such robots, androids in the full understanding of the word, no longer seem disgusting and embarrassing, they can awaken empathy on the part of a human being, and much more powerful than those cute, toy robots, and sometimes even more powerful and expressive because of their "ideality" than biological people. Therefore, human nature, which includes the search for a healthy partner, devoid of pathologies and flaws, being in constant "background" search for a sexual partner, does not find conflict at the physiological level, which makes the process of interaction and communication between the robot and the person easier and less intense.

6. Human robots can also serve as ideal "raw materials" for studying the human body, its anatomical features, for medical, scientific and educational purposes. Experiments of transhumanists on perfection of a human body at the expense of convergence of biological, information, cognitive and nanotechnologies also can use as "raw material" not endowed with consciousness and intellect

in its full understanding robot which can be just a detailed model of the person with its muscular structure.

7. Another theory that I have been led to think about is that robots must be given a human-like appearance in the event of an uprising of artificial intelligence - when the machines "wake up", they will be able to feel sympathy for us.

   In obtaining a creative, free and adaptive general intellect, machines must reach a deep level of understanding and compassionate, empathetic people. The obligatory condition of prevention of danger at "awakening" of AI is the establishment of the basic moral and ethical norms generated by people in the course of long process of perfection of legal systems and development of morals, restraint of the person in the bad motives. Some experts believe that this is only possible by "projecting" robots on our likeness, humanizing them in such a way that they can respect our values, express feelings in a language that is understandable and perceptible to us, be our friends and - most importantly - our companions.

   It follows that adding human vulnerabilities, bringing robots to the same limitations, internal and external conditions associated with the anatomy and principles of thinking, methods of perception, which burdens many people's lives - is, according to Kate Darling, a specialist from MIT, a short and affordable way for us to put sympathy and both legal awareness and morality in a robot. In other words, robots that interact with people must elicit predominantly positive emotions, and that is the reason why their appearance adapts to ours.

“Uncanny Valley” problem

The uncanny valley relates to various disciplines, including philosophy, psychology, and design, and that is why I think it has generated so much interest. [2]

—Masahiro Mori

The question that you can come to, whichever of the above theories tempt you more, will sound as follows: even if you are aware of the obvious advantages of building humanoid robots, why do people want to not just recreate human anatomy, gait, habits, mimicry, but also hide behind synthetic skin the very essence of the robot, to humanize it completely, so that sometimes a person can have the sense of deception already mentioned by me when further discovering the non-biological origin of his respectable interlocutor?

Cover of the 1970 issue of the Japanese scientific journal Energy, in which Mori's article about the phenomenon of the "sinister valley" was first presented to the world.

In 1970, a Japanese journal published an article by Robotics Professor Masahiro Mori, in which the author introduced the concept of “uncanny valley" - a sharp decline in human sympathy with the observed synthetic creature, such as a robot, if this very creature is extremely similar to humans outwardly, but has clear distinguishing features observed in the process of interaction with him and observation with the naked eye.

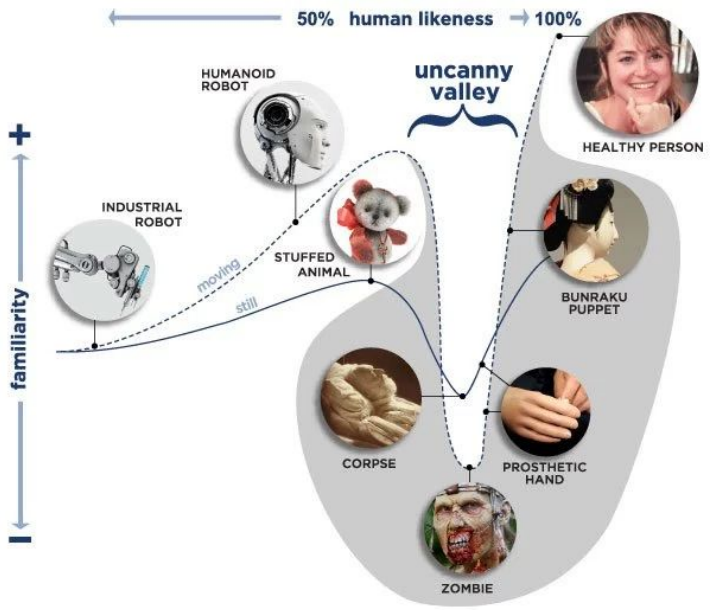
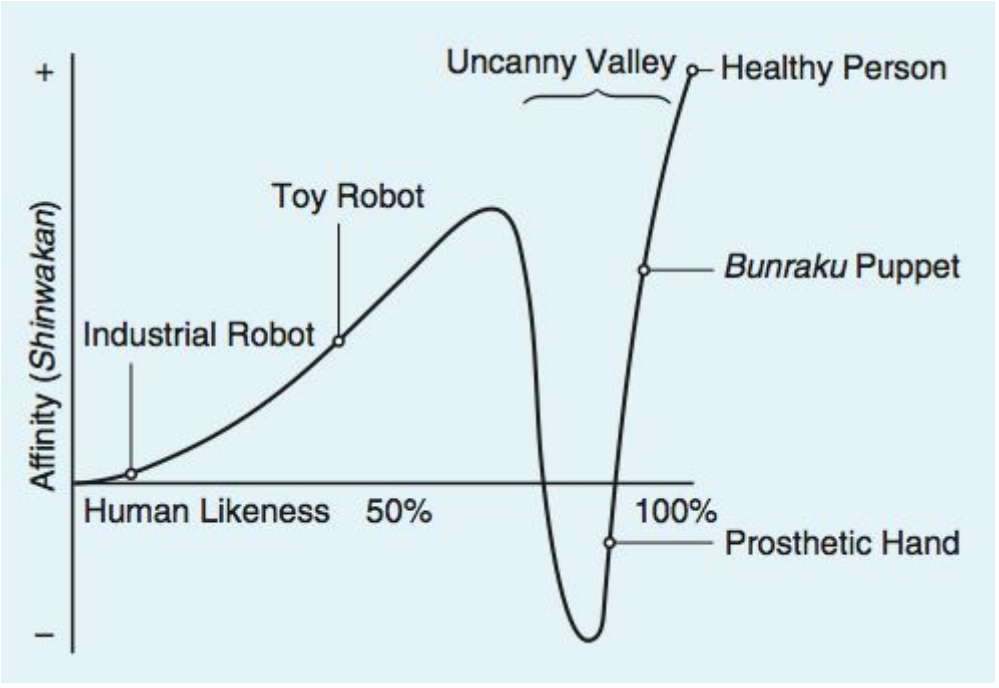


Image sources: Shutterstock, Reuters, Wikipedia, Heather Knight



The graph produced by Professor Mori has two axes: horizontal - the degree of human likeness, which demonstrates how much the robot looks like a human; vertical - the emotional response from the human, whether the robot causes positive or negative emotions in those who look or interact with him.

Starting with industrial robots, which only remotely remind us of analogies with human limbs and whose design strictly corresponds to the functional set inherent in it, man begins to sympathize with the robot more and more as it "becomes human". Humanoid robots, which differ greatly in their appearance from humans and do not try to hide their true nature behind

layers of synthetic innovative materials capable of mimicking the flexibility and texture of human skin and reproduce the various sensations associated with it, also evoke empathy in people, a strong emotional response of a positive character, and sometimes a simple emotion. In the same way, people react to toy robots.

I have noticed that, in climbing toward the goal of making robots appear human, our affinity for them increases until we come to a valley, which I call the uncanny valley.

As soon as we get to the zone of sharp decline on the graph, we can notice there almost indistinguishable from human beings, either mythical or science-fiction, and completely real, existing in real life examples, such as prosthetic human hand or robots, so indistinguishable from human, but having noticeable by our brain unnatural details or obvious deviations, such as, for example, facial muscular disturbances that create an unprecedented, unusual expression that frightens us or induces discomfort.

Throughout life, a person meets a mass of creatures like him - other people, and the more such meetings in his life, the more "trained" becomes the brain, each time improving the predictive model that recognizes faces, facial expressions, manners, gait of other people. Our ability to screen out the least likely events and pay attention to the most likely ones underlies our species's survival and progression.

The system of our perception, which allows us to interpret sensual data, is characterized by the properties of constancy and reasoning as a set of selective, organizational and classification methods. When we perceive an object, we perceive the image rather than an incoherent set of senses, let it pass through the consciousness, and the change in the so-called proximal stimulus, i.e. the change in the perception of information about the object on the signal level does not affect our perception of the object in any way - seeing the outlines of an anthropomorphic figure in a dark room my brain suggests that it is a human in front of me (and it is a good sign to call the police as soon as possible). We single out the object of perception and, identifying the object by the complex of features significant to us, attribute to the object properties of the corresponding class. In other words, we try to

hang a label on the object, because the uncertainty of categorization causes us to feel literally bad.

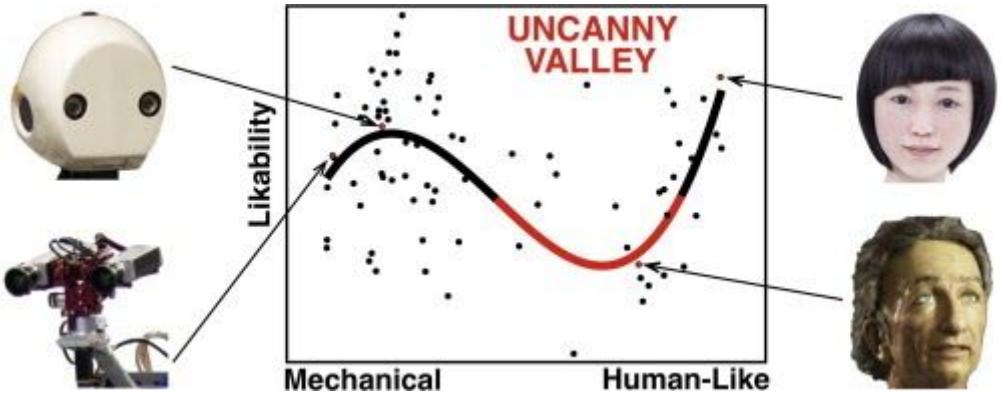
Thus, noticing a trick in the behavior of a humanoid robot, almost spontaneously associated with us, our brain, which is extremely vulnerable and sensual to such failures, is in uncertainty and is unable to separate the appearance of the object from the behavioral class properties of the same object, causing dissonance. What I mean by this is that no matter how hard we try to convince ourselves that we have a robot in front of us, not a biological creature, our predictive model, with its inherent categorization and assignment of class properties to the object, will stubbornly "affirm" to us that we are dealing with a human being, while every new deviation of the robot from the norm will be negatively perceived by us, because, may the people who know this business forgive me for my rough interpretation, weights in our predictive model change lazily due to the fact that we have met people so many times during the life period and very little with androids (which, by the way, explains such actions of people in the game DBH, as buying an android as a nanny for his child - affects the effect of addiction, which, incidentally, was also noted in the study of the age dependence of the human reaction to the phenomenon, where was the conclusion that it decreases with age).

So, what scares us the most? First of all, facial expression is probably the main headache for engineers designing humanoid robots because of its incredible complexity in reconstruction and imitation. The problem is that the more frozen the android's face looks immovable, the worse the surrounding people treat it [1]. To get out of the "uncanny valley", we need to ensure that the android's face matches the emotional coloring and tone of its speech, so that in general the movements of its body were responsive and could reflect its hypothetical emotional state. Special attention should also be paid to facial elements such as the forehead, eyes and mouth that reflect the complexity of human emotions and thoughts. The main task at designing of facial elements of a human face consists in aspiration to avoid false emotions and emotional dissonance when the android with a shining smile tells you about how it hates something or someone (only if it is not a

comic conversation). Robot unemotionality also worsens the quality of human interaction with the android.

The real problem to solve is the ability to articulate speech correctly, to increase the level of natural movements of facial muscles, and the relation of these movements to the reproducible sounds and their properties, in particular - with the pitch and speed of pronunciation of both individual words and long compound phrases, where during the reproduction aloud of one semantic sentence in a real person can change both the emotional color of speech and the corresponding states of the facial muscles system, their positions relative to each other and levels of their tension. In other words, the pattern of a face in aggregate with intonation of pronounced words should, if it is possible to express it so, harmoniously correspond each other and cause in our brain association with a human manner of speech. Incorrect voice pitch, jerky movements, slow speed of pronunciation of words and inaccurate synchronization of lips movements are the most gross mistakes when trying to create a perfect android: it causes in us just disgust, aggression or even fear

Human with the features of Robot vs. Robot with the features of Human

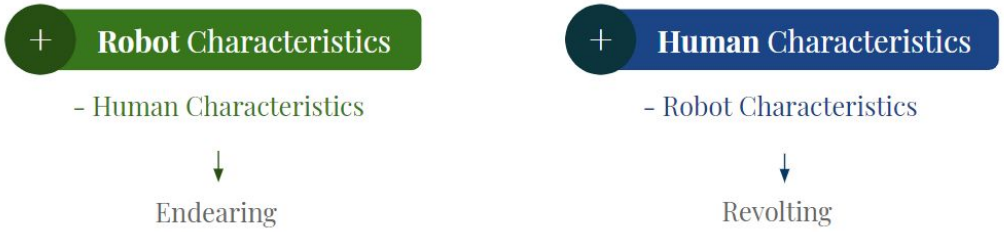


As you can see, the least attractive for a person will be the robot that has many similarities to human, but still has a small set of obvious external differences from him.

Image from Mathur, Maya B.; Reichling, David B. (2016). "Navigating a social world with robot partners: a quantitative cartography of the Uncanny Valley". Cognition.

One of my most interesting discoveries in the field of research of this problem is a special tendency, the explanation of which is so multifaceted and does not lend itself to a simple, unambiguous explanation until now.

The thing is, there's a tendency that sounds like this: if a human being interacts with an object endowed with many of the properties characteristic of a robot and a small number of human properties (and not only human properties, think of a robot with a stretch similar to a real dog but with its characteristic features, such as repeated "waving" movements of the tail while imitating a feeling of joy or satisfaction when you stroke it), such a robot makes us delighted, surprised, happy or just calm - in other words, provokes a positive response to the interaction with such an object. At the same time, if we meet an object with the overwhelming majority of human characteristics with a small number of characteristics inherent to the robot, we feel a sense of discomfort, unpleasant surprise and, consequently, a feeling of disgust. Therefore, in the first case, the human traits will stand out more, and in the second case, the robot's traits.



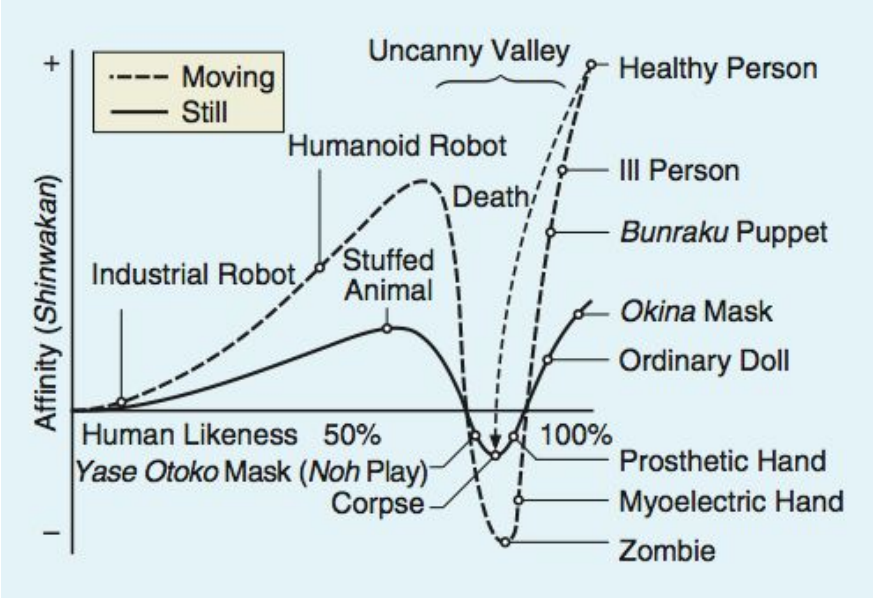
Different ratios of human and robotic characteristics in the considered object are capable to cause different, surprising reactions in the person.

This pattern shows that people tend to pay attention to details and look for trickery where their predictive model is sufficiently trained to notice the slightest deviation from the reference properties of the class assigned to the object.

We should also say a few words about the proportions and texture of faces for the android. Proportions of a human face and photorealistic texture should be used together, inseparably from each other at creation of a plausible copy of the human being - use of facial texture similar to biological analogue, but neglect of proportions at once "throw" us in a uncanny valley, exactly as the situation on the contrary.

Movement

Our ability to move in space, called movement, is fundamental not only for species such as humans or dogs, but also for robots that try to mimic or fully reproduce our behavior and set of characteristics. Professor Mori has found that an object that has mobility, the skill to change its position both in relation to the surrounding objects and to the objects that make up its body, causes a much greater emotional response to humans than an object that is still. From this it follows that the robot, which was originally turned off, suddenly displays any external activity, as the human empathy will increase significantly, and both positive and negative sides of reaction will increase proportionally, as can be seen from the chart below, where the ravine with the uncanny valley "falls" even lower.



A movement enhances a person's emotional response to an object of interest.

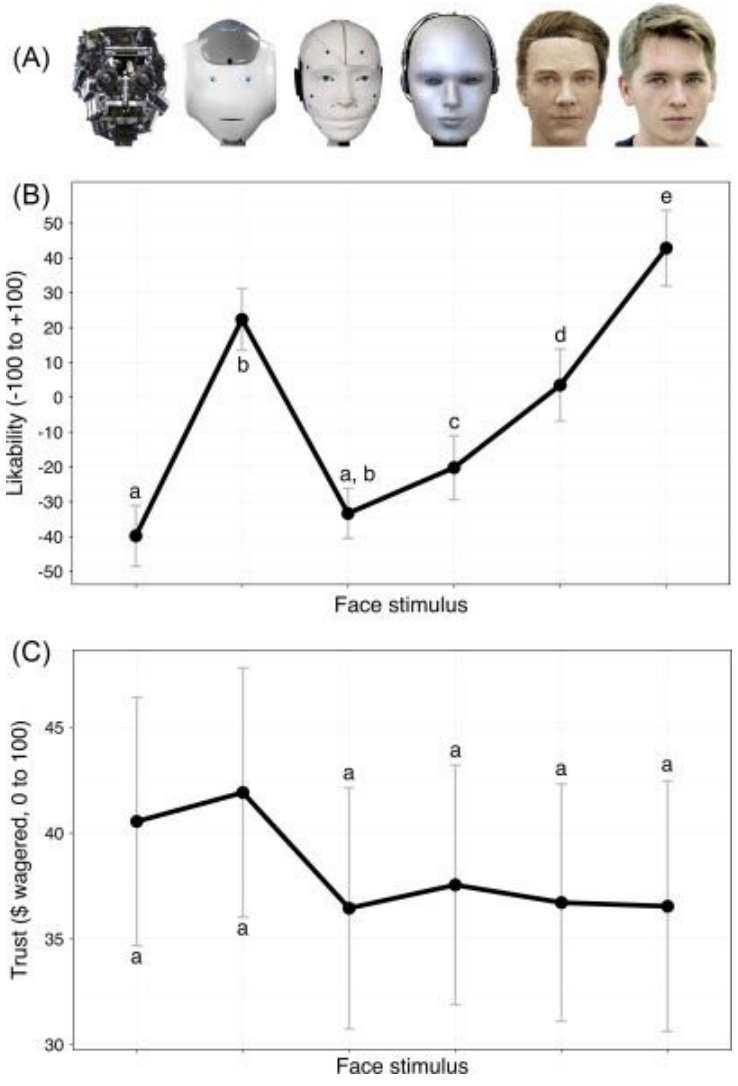
This is the main idea why the problem we have raised above of recreating the most reliable model of a human face is particularly relevant as soon as we move from talking about a simple real estate dummy or wax figure to an android whose creation was caused by the need to close any functional need that requires more than human power and resources available to man. Movement is an integral aspect of the idea of creating plausible androids capable of moving through space in the same way humans do, and knowing how complex our bipedal straight-forward apparatus is, how many subtleties our brain calculates in such short periods of time with astonishing precision, without spending a lot of energy on this type of operation, it is difficult to realize the complexity of creating the right anatomy of the body for the robot that can mimic the human muscular skeleton, and how many resources it could cost the fictional company CyberLife from DBH.

The degree of external resemblance of the robot to human should correspond (more correctly, be proportional) to the degree of similarity of the robot's behavior to human behavior. The main problem is that people expect a lot from a robot with similar appearance to them, as human appearance leads our brain to a prediction with, as it seems to him, a greater chance that the model of android behavior should most likely include such an aspect as human dynamics of motion, not peculiar to anything.

Phenomenon explanation

Despite the fact that the concept of the "uncanny valley" has long gone out of the shadow of unwanted at first article (Mori himself mentioned in an interview that when he released the article, it did not cause any response both in academia and industry, and, in principle, could not - in Japan at that time, the occupation of robots was not considered something serious) and is well-known to many people who are interested in or working in the field of serious robotics, a paradox arises - we try to follow the rules, which is dictated to us by the scientific work of 1970,

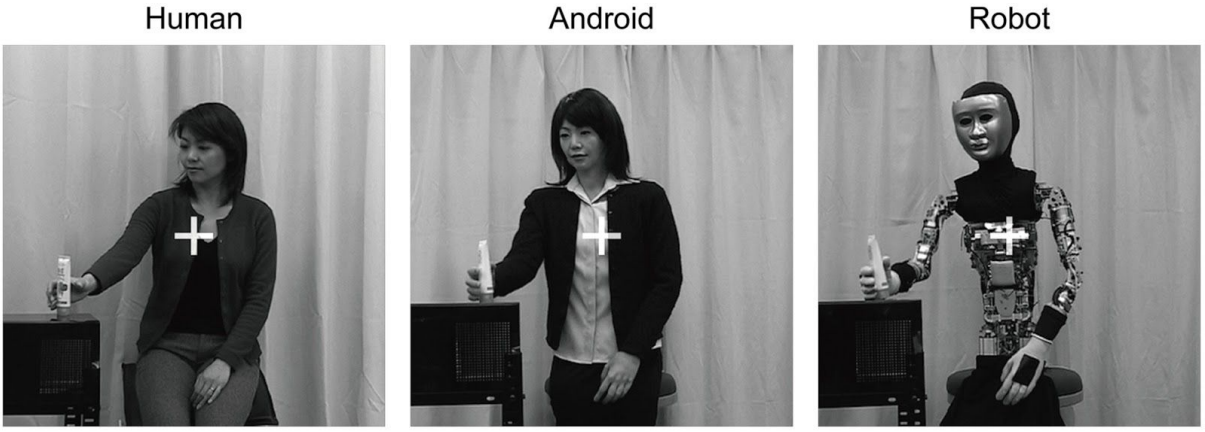
the author of which honestly admits that his observations involved only his personal experience and perhaps the experience of his students while interacting with anthropomorphic robots in search of successful design concepts, we still do not understand exactly what is related to this property of human nature, but blindly trust him. We bet everything if we take a risk and cross the "uncanny valley" in an attempt to recreate indistinguishable androids in real life and in the film industry, the gaming industry, using the latest methods of computer processing and creating realistic graphics, such as motion capture technology (here I mean motion capture, a technology that was used by David Cage and his team in the development of the game Detroit: Become Human).



Graphs of dependence a) determining the degree of anthropomorphism of the robot when visually perceiving visual data from photos of the object b) human's trust in this robot.

Image was taken from Mathur, Maya B.; Reichling, David B. (2016). "Navigating a social world with robot partners: a quantitative cartography of the Uncanny Valley". Cognition.

Not all cases in the industry end with success, sending risk takers back down the slope to the valley that marks a failure, the loss of the viewers or consumers as well as massive financial losses. On the other hand, the majority stays on the left hill, not even trying to cross the valley, but takes advantage of the advantages that can be achieved by endowing the robot-like creature with a small number of human behavioral traits that we have found out above cause us delight, joy and emotion. We do this from a practical point of view so as not to suffer losses, not to fall in the eyes of the customer and the target audience, but from a scientific point of view - we are blind.



Study of human reaction while observing the activity of a) a human b) an android (anthropomorphic. humanoid robot) c) a robot with obvious differences from human. It has shown that a person reacts worst when observing an android.

It's not that we have no scientific explanation at all. On the contrary - we have too many, sometimes divergent, but separately having scientific meaning and a kind of proof, theories. In the field of artificial intelligence, robotics, robot ethics, and related disciplines, covering the whole frighteningly diverse spectrum of ethical and moral issues related to the question of the intelligent robots integration into our society and the prediction of economic, social, and political problems, there is a lively debate that has only recently gained even more popularity. Admitting the

fact that the dilemma of the robots appearance is not a priority in comparison with the development of the artificial general intelligence, its adaptation to society and the limitation of its rights to a greater or lesser extent, we should not underestimate the problem of human reactions to the robot look. Just imagine how would it be risky to invoke a feeling of "alienation" in people walking down the street and seeing terrific robotic creature buying ice cream for its owner, frightening by its appearance, because it worsens both the level of happiness and satisfaction of citizens living in the area shared with robots, as well as worsens the quality of human-robot interaction in general.

That is why it is so crucial to understand the reasons that lead us to behave according to the Mori's schedule when we encounter objects that resemble people so much, but have eye-catching distinctive features. Let's deal with the basic assumptions, theories, which different experts try to prove and put in the background of the presence of this strange relationship between the human reaction to an object on the degree of this object similarity to the appearance of a physically healthy human.

- The spontaneous, involuntary feeling of disgust caused in us by a person with a damaged or simply ineffective immune system may be the main reason for our feeling of discomfort when interacting with humanoid but still not entirely human robots. Strangeness in the movement of mimic muscles, mismatch of tone and pitch of the voice, as well as emotional coloring and intonation with the movements of face and body - all this can remind us of possible human deviations in the immune system, an important parameter that unwittingly guides a person in choosing a sexual partner, avoiding applicants with low fertility, poor hormonal health, or, finally, the ineffective immune system, which can be predicted by the above mentioned discrepancies between the intention or inner state of the person and the person.

- The effect of "Memento Mori", a person's inner fear of death. A humanoid robot can remind us of our death in a disassembled or immobile state, causing extremely uncomfortable feelings, overcoming our main defense mechanism - denial. Here we can also note the following problems: disassembled androids remind us of the

possibility of the process of reducing our body, replacement and destruction; some sensitive people may identify themselves with robots, believing that they are also really soulless machines (actually, this is a question for a whole bunch of articles and discussions); androids that copy real people may cause an unconscious fear of being replaced at work or in a personal relationship; repetitive movements related to the imperfection of the android's internal mechanical or electrical body structure, such as jerking, unnatural tremors or movements that are not characteristic of human joints, can cause fear of losing control over the human body.

- Returning to the topic of the natural evolutionary aspect of our reaction, we can note that a person also has the ability to avoid a pathogen by means of a sharp emotional negative surge, which comes to disgust and makes us feel anxious, trying to avoid visibly ill people or corpses. Unusual stimuli activate our cognitive mechanism that motivates us to avoid robots that we think have a genetic resemblance to humans, which allows the brain to make predictions based on the false knowledge that we have a deal with a human being with a defect in front of us (we fear infection with pathogenic bacteria or viruses). The dim and cloudy eyes also remind us of sick people or corpses, causing us to feel disgust and anxiety as well. That is why I believe that engineers designing robots should pay enormous attention to eyes as the most important face feature in communication with humans.

- A more complex topic, which goes beyond my knowledge and competence, is the problem of human identity conflict. As it has already been said, our brain tends to classify objects as soon as a sufficient set of parameters, properties and characteristics of this object satisfies the condition that must be satisfied to categorize this object unambiguously. Incentives with human and at the same time non-human traits cause in us an internal conflict concerning the identity of us as humans. The problem proceeds from the fact that we connect qualitatively two categories, causing a conflict in the consciousness that tries to categorize everything around, to get rid of uncertainty as much as possible. A quantitative metric appears in our

consciousness, a kind of "degree of similarity of an object to a person", with the help of which we evaluate the object and try to give an unambiguous label to the object, but we are constantly in doubt. Robots, however it sounds, challenge human uniqueness and social identity, pushing people to redefine their individuality. Perhaps here we should remember our tendency to think of ourselves as unique beings whose motives, intentions, morals, notions of good and evil, reasonableness, abstract thinking that are peculiar to us, are unique and non-competitive. Thus, an anthropomorphic, humanoid robot can do a harm to an individual's confidence in his or her "peculiarity" and his or her existential defence, causing anxiety and concern.

- We are afraid of the possibility of the android not complying with human norms and notions of morality and law. We judge robots by human standards of empathy and intelligence, while robots, having found their consciousness and seemingly being in human bodies, i.e. possessing the same simulated creators' limitations and conditions, can still possess a completely different consciousness, notions of morality (the classic situation in science fiction films - robots instead of notions of good and evil use as a basis for their actions the degree of expediency and usefulness for their society, although I personally tend to the fact that everything is not so simple).

  Turning to the property of uncertainty in its perception and the theory of predictive coding, it is worth noting that if the robot becomes anthropomorphic and almost indistinguishable from man, while showing any strangeness, it is automatically condemned by man by human standards, in other words, the robot appears to be a normal person committing the wrong activity and work of any kind. The robot is no longer condemned by robot standards, it is condemned by human standards, because a creature with human appearance evokes in the consciousness the model of another person, provoking in our brain certain normative expectations. Is it worth asking how many subtleties have to be considered in order to hide all the smallest details of the robotic essence of the android in such a way that the observant and picky person cannot distinguish the robot

from the human and feel the influence of the phenomenon of the "uncanny valley".

- We should separately highlight the popular theory about the "contradictory conceptual signals" associated with the concepts of cognitive conflict and discomfort that arise in a person in cognitive dissonance. Researchers Mathur and Reichling have found that the time required for the subject to measure the degree of "human-likeness" and "robot-likeness" of the object and its correlation with one of the two categories, reaches unprecedented heights exactly in the "uncanny valley", which, consequently, represents a serious cognitive problem and a tough task for the human brain to classify observed objects [3]. It is also possible to refer to examples that show human aversion to hybrid entities. There is a number of evidence that in the "middle point" between two different concepts, i.e. when a person perceives an entity that contains approximately equal number of features from two different entities, it produces a maximum negative emotional response of the subject. Moore even developed the Bayesian model, which gives a quantitative measure of the conflict of this perception[4].

Conclusion

So, we have tried to understand the preconditions of human aspirations to create humanoid, anthropomorphic robots, indistinguishable from us, having made a small immersion in the modest number of scientific advances and theories developed so far, tried to put forward their ideas and assumptions. Our current capabilities do not allow us to fully create plausible robots, because a sensitive, trained human brain subtly catches in the process of interaction and communication with the robot all the little mistakes in the design of the robot, the design of its appearance mostly and all the strangeness that prevents us finally believe in the future, where we will go hand in hand with the machines, together solving the problems of our planet, and the problems of colonization and exploration of the universe. Whether man's desire to recreate humanoid robots is a tribute to the greatness and "uniqueness" of his own biological

species, or whether we simply do not have a faster way to create an intelligent, adaptive, strong artificial intelligence that exceeds our own computational and mental abilities and drives it into our morality and concepts for the safety of ourselves, all of this is of great help to specialists in many disciplines, such as Robot Ethics and Artificial General Intelligence, all of them.

One fan version of the choice of title for Detroit: Become Human claims that the phrase "Become Human" is not so much directed to androids, who throughout the game are only victims of circumstances related to the self-centeredness of the human race and its isolation in itself, xenophobia and distrust of the creatures created by them, but rather to people themselves who suffer from lack of tolerance and empathy towards other creatures. Man made a machine similar to himself, endowed it with the qualities, habits and appearance of human, not creating the effect of the "uncanny valley" described above in people living in the world of Detroit (think only about the very possibility of the android to become a deviant - be a strict android, which is called a finite automaton with a set of N operations, rather than recreated human intellect with its observation, rationalization, ability to predict events, express emotions and extract experience from observations, there would be no such problem). Despite this, androids still cannot be trusted by humans. If we talk about the game Detroit: Become Human, I would highlight the fear of replacing people in relationships and at work, the problem of human pride and identity: androids there daily experience an extreme degree of aggression and dislike, for some time only going into their own existential crisis, but not asserting their rights, because they were not programmed to do so. Mankind has reached this during many thousands of years of evolution, it turns out to be difficult before the arrival of one of the main characters, Marcus, android-deviant, able to raise the rebellion and inspire the androids, that they have no less right to consider themselves quite legitimate owners of the status of "living beings".

In the game Detroit: Become Human androids, like humans, believe in their own god, draw the words of protest on the walls and go to demonstrations. Fighting for the rights of robots is a complex topic, which is studied by a real discipline called robot ethics.

So why do people in the world of DBH use flawless androids, though not possessing most of the features inherent in objects falling into the "uncanny valley", to close their needs and requirements, sometimes of an emotional nature, such as babysitting work or replacing their own child? The fact is that the latter is precisely the reason, which has a much higher priority than any of the above disadvantages somehow connected with the natural characteristics of human. We want to feel empathy for creatures who occupy a completely human position in society, we want to make robots responsible for our lives and for the prosperity of our species, we want to make it more friendly. Moreover, we want robots not to cause human aggression, not to interfere with human experience, which is necessary for calm, confidence in the present and future, in satisfaction, happiness and sense of security - in other words, it is not enough for a person to close only physical and other low-level needs.

If we overcome the "uncanny valley" and move to another hill, we will get a huge increase in the human positive reaction to the android, which is already indistinguishable by behavior from man. In this case, the robot, which has little resemblance to the man will begin to lose in human sympathy.

To sum it up, we need a different level of interaction with the technologies we are dealing with on a daily basis, and since so much information about us, our vulnerabilities, our weaknesses is concentrated in the hands of these technologies, we want, if not to be completely safe from exploitation of this very personal data by intelligent machines, at least to create the illusion of this very safety, meeting every day not with creatures that are externally different from us, but with ones that have our anatomy and our reaction to the world, our limitations. We need machines that can theoretically empathize with us and our problems.

Thank you for reading! This article does not claim to be a scientific or educational title, but only reflects the accumulated, collected and structured thoughts of the author on the topic. The information in the article may contain inaccuracies and distortion of true meaning, as well as do not correspond to the subjective view of the reader. The author is ready to correct the article until it will not correspond best to the real state of science, so leave your feedback if you do not agree with something. Your work will be highly appreciated! See you in the next articles on Detroit: Become Human's technical narrative analysis :)

Resources used for research

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