DOI: 10.2478/aa-2023-0007

Technological imagination as a source of the culture of neural networks

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Abstract:
The study represents a partial output of research on the culture of artificial neural networks, as the authors call the cultural complex, in which a number of different actants participate (technologies, their users, results of the generation process, their recipients, media, etc.) and which is constituted by language games that have a performative function. The aim of this study is to conduct a media-archaeological insight into the imaginative layer of these language games and to point out that one of the sources of neural network culture is precisely the deeply historically anchored technological imagination. The genealogy of this imagination is traced in the study from its ancient origins to the 1950s, when the idea of the artificial mind was transformed into a scientific theorem and founded the research field of artificial intelligence. In this way, the paper draws attention to the fact that when we think and talk about artificial intelligence, we are talking about a set of imaginations that should not be confused with reality, but rather treated as technological fictions.

Introduction

"While the symbolic AI paradigm is more capable of following procedures in a deductive and deterministic way, the subsymbolic one is, instead, more fluid, inductive, and able to perform tasks such as recognizing natural language, images, or objects" (Possati, 2021, p. 12).

The phrase "artificial intelligence" is undoubtedly one of the most frequently used terms of today. The ambition of this article is not to engage in a discussion with theoretical cyberneticians or technology developers who commonly associate their professional work with this concept. Instead, we offer a smaller media-archaeological probe that points to the primary sources of thinking about artificial minds or artificial humans, that is, historical visions that artificial intelligence itself has absorbed and still somewhat unfortunately implies.

We proceed on the generally accepted assumption that so-called general artificial intelligence has not yet been developed, but a multitude of specialized technologies (corresponding to the concept of narrow artificial intelligence) have emerged, which are referred to as artificial intelligence and now form a highly branching and dynamically evolving cultural complex that increasingly influences our everyday lives. The term "artificial intelligence" can be considered misleading when discussing examples generated using artificial neural networks (see Pioreckỳ & Husárová, 2022, p. 500), so we will mainly talk about artificial neural networks or *the culture of neural networks*, as we would like to name this cultural complex. First, let's briefly discuss the proposal of this term.

The culture of artificial neural networks

The term "culture of neural networks" pertains to the processes and interactions within a network of actors, primarily comprising the technologies of artificial neural networks themselves, the corporations that develop them, the users of this software, the products of their creation (artworks), their recipients, the media that mediate these products, and, not least, the metatexts and paratexts that accompany them. The culture of neural networks is highly vibrant and dynamically evolving. It is as if it were new, even though it is inseparably linked to cultural traditions and (often rather archaic) technological imaginations.

Therefore, one of the primary questions we pose in connection with it concerns the relationship between the old and the new; the relationship between cultural tradition and its

embodiment during generative processes that occur through neural networks; the relationship between new technology and older methods of creating artefacts; the differences between existing ways of perceiving artworks and the reception processes that expect works generated by neural networks – and in this study, primarily the relationship between imagination and technological development, i.e. the relationship between the dream of artificially created human being. It is the relationship between the genesis or historical variability of imagination and the current state of technological imagination about artificial intelligence, which is an important part of the culture of neural networks.

Phil Turner, in his book *Imagination + Technology* (2020) assumes that all digital products are products of our imagination (cf. Turner, 2020, p. 122). Within this technological imagination, he further distinguishes between "Imagining the Possible," and "Imagining the Improbable". "Imagining the Possible" refers to imagination that is an integral part of the development of specific technologies, as well as a natural part of their usage (often metaphorical in nature: this technology is somewhat like...). Through this form of technological imagination, we can "translate" digital technologies into an analogue language, making it easier to understand them (after all, even the use of artificial intelligence technologies is based on this interaction metaphor: software that creates sentences or images like humans "must" be somewhat like a human...).

However, our focus in this study is on the second type of technological imagination, namely the imagination of the improbable, which is primarily expressed through what Turner calls "design fictions" – texts, films and other artefacts that, through their thematic focus and form, can foster interest in the future of technologies. The purpose of design fictions is not to show how things will look in the future but to open space for discussion. Design fictions are based on provocation, asking questions, and exploring possible innovations (Turner, 2020, p. 125). Turner also emphasizes that discussions about the future of technologies should stem more from the social and cultural sphere than from the technical realm. This perspective is hard to disagree with – envisioning the future is not merely a spontaneous movement of technology but arises from social and cultural realities or needs. These desires and needs leave their mark on history in the form of artefacts because art is a sufficiently sensitive medium to capture and materialize this kind of imagination. In the following text, we will therefore analyse the traces of this imagination in the texts that provide the fertile ground from which the culture of neural networks grows. But first,

let's have a look at the emergence of the theoretical discussion on artificial intelligence, which transformed the mentioned imaginative line into a form of scientific discourse.

Opus contra naturam or the foundations of theoretical propositions about artificial intelligence

In the mid-20th century, pioneers in computer science, notably Alan Turing and John von Neumann, discussed the analogies between the human brain and computers, suggesting that human intelligence (mainly reduced to following concrete tasks) could be replicated by computers. The term artificial intelligence can be traced back to the legendary two-month summer seminar at Dartmouth College in 1956, organized by John McCarthy, Claude E. Shannon, Marvin L. Minsky and Nathaniel Rochester, attended by 10 young leading computer scientists. John McCarthy coined this term to distinguish it from the field of cybernetics. As he stated in his book *Defending AI Research*, cybernetics' focus on "analog feedback seemed misguided" (McCarthy, 1996, p. 73). The idea behind the concept of AI as a research discipline was the "the conjecture that every aspect of learning or any other feature of intelligence can be in principle so precisely described that a machine can be made to simulate it" (Dick, 2019, online). As McCarthy later admitted, nobody liked this name because the goal was genuine intelligence, not artificial intelligence (see Mitchell, 2020, p. 18).

In the field of artificial intelligence, we can distinguish between two paradigms: the symbolic and the subsymbolic (or connectionist) (see Mitchell, 2019, p. 21). While the symbolic paradigm was inspired by mathematical logic and conscious thought processes and can be considered transparent because it follows rules and processes set by humans, the subsymbolic paradigm lacks such transparency – the term "black box" is a justified poetic descriptor here – it learns from prepared data and performs certain tasks based on that data. The symbolic paradigm (especially in the form of expert systems) defined the first 30 years of AI research after the Dartmouth workshop. Its proponents no longer claimed that AI could be created by copying human thought processes but argued that general intelligence could emerge through the right symbol-processing programs. The subsymbolic paradigm drew inspiration from neuroscience and attempts to capture even unconscious thought processes (fast perception), such as facial recognition or speech identification.

At its core, its approach to symbol processing emphasizes neural architectures that provide the foundation for learning character recognition. Although its flourishing came with the rise of deep learning, an early example of this paradigm was the Perceptron program developed by psychologist Frank Rosenblatt in the late 1950s, inspired by neural information processing. He even proposed that perceptron networks could be capable of recognizing faces or objects and designed the perceptron-learning algorithm (see Mitchell, 2020, pp. 24-26). However, the field of artificial intelligence did not see much promise in the subsymbolic paradigm (Minsky and Papert even labelled the multilayered composition of perceptrons as a "sterile" path in their book *Perceptrons* from 1969), and for a long period, it promoted the symbolic paradigm, which became the foundation for the establishment of American AI research centres at universities in the 1960s and a means of their government funding.

Predictions by pioneers of artificial intelligence from the 1950s and 1960s, who linked their proposals to the advancements in computer science during the 1950s, did not materialize as expected, and research in machine translation stagnated. AI research went through periods known as AI springs and AI winters, during which the initial ecstatic enthusiasm and high hopes for the emergence of artificial intelligence turned into resignation due to the inability to meet expectations and predictions, leading to financial cutbacks from government institutions.
A significant shift in artificial intelligence research occurred around 2006 when multilayer neural networks (an extension of Rosenblatt's perceptrons) yielded remarkable results. Since that time, there has been talk of another AI spring, associated with the advent of deep learning and machine learning.

The connectionist paradigm in the culture of neural networks

The functionality of neural networks is based on recognizing sequences in data and attempting to replicate or mimic these sequences. Neural networks don't operate at the level of alphabet characters, musical notations, or visual representations; instead, they recognize these symbols through numerical relationships.

It's also important to note that artificial neural networks are extremely abstract versions of brain neural networks. Artificial neural networks transmit simple numerical signals, whereas biological ones transmit a series of pulses. Brains consist of various types of neurons, but artificial

neural networks utilize only one type of activation unit. Brains operate based on parallelism, while artificial networks, though significantly faster than their biological counterparts, can only perform computations serially, making them overall less efficient. Another essential aspect is the principle of fragility: since each artificial neuron acts as an independent processor, an error in one significantly affects the functionality of the entire model. Our brains are accustomed to neuron death and can adapt to new circumstances.

If we shift from biological terminology to the technological aspect introduced at the beginning of this study, specifically to the symbolic and subsymbolic (connectionist) paradigms, we can find the connectionist paradigm related to neural networks in the study of Hannes Bajohr, specifically dedicated to the literature of neural networks. Hannes Bajohr (2022) distinguishes between "sequential" and "connectionist" paradigms in digital literature. The "sequential" paradigm pertains to linear algorithms, which means digital literature created using readable code, while the "connectionist" paradigm concerns digital literature generated using neural networks. The essential nature of the generated literary works lies in the code – one created by the authors or technical collaborators, accessible to recipients for reading and even critical reflection through tools of "critical code studies" (advocated by Marc Marino, see, for example, Marino, 2020). This involves perceiving the artwork not only through interface presentation but also through mutual interaction with its code background.

The connectionist paradigm draws on the terminological discourse of AI and, in contrast to the sequential paradigm, emphasizes the nature of neural networks as a "black box," implying the inability to see beyond what is presented. Unlike explicit programming, this case involves implicit learning: "There is no code to inspect in this case; instead, there is only a list of numbers representing the structure of the network and its weighted connections, but such a list is extremely difficult to interpret."[1] (Bajohr, 2021, p. 483).

The complex of the culture of neural networks is a discourse in which various degrees of practical achievements of the technological revolution intersect with specific creative practices in the fields of digital art, literature, music and various intermedia and transmedia projects. Simultaneously, it is influenced to an equal extent by human imagination in the form of literary texts and artworks, as well as technological visions within the scientific community. Often, artistic

[1] Es gibt dabei keinen Code, der zu inspizieren wäre, sondern nur eine Liste von Zahlen, die die Struktur des Netzes und ihre gewichteten Verbindungen darstellen; eine solche Liste ist jedoch ausgesprochen schwer zu interpretieren.

imagination has predetermined technological directions, as evidenced by numerous examples from science fiction literature and art, with technicians drawing inspiration from it in their practice. The archaeology of (synthetic) media can help us find answers to questions about how unique contemporary synthetic artistic practice is and how it reinforces old likenesses between humans and divinity.

The beginnings of artistic imagination of the (technological) progress

"There, intent,
Pygmalion stood before an altar, when
his offering had been made; and although he
feared the result, he prayed: "If it is true,
O Gods, that you can give all things, I pray
to have as my wife—" but, he did not dare
to add "my ivory statue-maid," and said,
"One like my ivory—." Golden Venus heard,
for she was present at her festival,
and she knew clearly what the prayer had meant.
She gave a sign that her Divinity
favored his plea: three times the flame leaped high
and brightly in the air." (Ovidius Naso, 1922, online)

Pygmalion's desire for a pure and beautiful being, in contrast to the shame and imperfections of women in his city, led to a prayer to Venus for the revival of his own artistic creation. Galatea, a statue with a perfect female body, carved from ivory by the sculptor Pygmalion, becomes his wife after gaining humanity and gives birth to a daughter named Pafos. This story has various versions: according to one of them, Pygmalion was a Cypriot king who fell in love with a statue of the goddess Aphrodite, while according to some others, Aphrodite came to see Galatea and was delighted that she was sculpted to copy the goddess's body. According to the Greek version, the goddess was Aphrodite, while her Roman counterpart was Venus.

Although the circumstances may vary somewhat, the foundation remains the same: a man's desire for a perfect woman, which, in the event of dissatisfaction, leads to a creative appeal to a

deity. Such a stereotypical approach has been confirmed in other later imaginations, which we will explore further, or has become the target of artistic satire, as evidenced by Isaac Asimov's feminist science fiction short story *Galatea* from 1987, in which the female protagonist, Elderberry, is the scientific experimenter. The male statue Hank, brought to life by Galatea's uncle George through the imp Azazel, fails to meet her expectations because the trait that was given to her as defining, namely softness, also describes the male genitals of this statue: "When I said I wanted Hank soft, I didn't mean soft all over, permanently" (Asimov, 1987, online).

The early pioneering inventors from the ninth century from Bagdad were three Persian brothers with the family name Banū Mūsā ibn Shākir: Muḥammad, Aḥmad, and al-Ḥasan. Sons of the famous astronomer and astrologer Mūsā ibn Shākir, they all lived as scholars, engaged in the fields of geometry, astronomy, mechanics and music, and were instrumental in translating ancient Greek manuscripts. They wrote the manuscripts the *Kitab ait Hiyal* (Book of Ingenious Devices, circa 850) and the *Kitab al-urghanun* (Book of the Organ, circa 850), in which they described around 100 innovations such as automatic controls and the automatic crank, valves, automatic fountains, water dispensers, various lamps, a hydropowered organ, etc. Their remarkable treatise *al-Āla allatī tuzammir bi-nafsihā* (The Instrument Which Plays by Itself) describes a plan and a design for the first programmable machine, an automatic flute player. The instrument is a mechanical hydraulic organ, where the air powers a flute with nine holes: "The holes are opened and closed by eight levers, the ends of which make contact with the fixed raised pins arranged on the lateral surface of a revolving cylinder so as to produce a well-known melody" (Sanjakdar Chaarani, 2021, online). The flute produces melodic tones in alignment with the programmed melody on its rotating cylinder. As the Banu Musa proposed in their manuscript: "If we want to create a humanoid flutist, we simply have to incorporate the whole device in the body of the statue, fix the flute in its mouth and disguise the levers as fingers and adapt it to his arms" (Sanjakdar Chaarani, 2021, online), thus designing the first automatic musical humanoid.

A Muslim inventor 300 years after, Ismail al-Jazari (1136 - 1206), originally from Jazira, whose visual designs and projects made their way from the Near East to Europe, was a polymath, engineer, artist, mathematician, astronomer, designer and inventor. Al-Jazari, often referred to as the father of robotics, described programmable humanoid automatons in his publication *The Book of Knowledge of Ingenious Mechanical Devices* (*al-Jāmiʿ bain al-ʿilm wa al-ʿamal al-nāfiʿ fī ṣināʿat al-ḥiyal*) from the year 1206. He enriched his text with specific illustrations, assembly

instructions and design methods. His automatons included a robotic girl serving drinks, a fountain with a peacock, elephant clocks, automatic gates, various automatic machines and musical automatons. These automatons such as the robotic girl serving tea or water, wooden figurines in a boat playing musical instruments, water clocks with drummers, and other automatons in his inventions can be considered as remarkable examples of a practical use of humanoids.

It is said that even Da Vinci was inspired by Al-Jazari's approach when creating his own automaton in 1495, which took the form of a metal knight. The probable constructor of the 1565 automaton, a Franciscan monk made of wood and iron, who walks and kisses the rosary, is the Italian-Spanish clockmaker, engineer and mathematician Juanelo Turriano from Toledo. The legend of the Prague Golem, which originated from Jewish mysticism and found its way into literature and film, tells the story of Rabbi Judah Loew creating the Golem to protect the Jewish community from anti-Semitic attacks.

The word "Golem", referring to an image endowed with life, comes from the Bible and Talmudic literature and signifies unformed substance. From the Middle Ages, there are several legends that speak of the power of a magical word that can transform a lifeless matter into a living one. "Abracadabra", a phrase meaning "I create through the word," materialized in the narrative about the Golem. The rabbi placed a piece of paper with words in the Golem's mouth (or head in some alternations), which brought it to life. Removing the paper took away its life. The Golem was initially a perfect servant, with its only flaw being an overly literal interpretation of commands.

Facets of automata in technological construction and literary imagination

In his publication *Musurgia Universalis* (1650), the German Jesuit scholar Athanasius Kircher provides instructions and illustrations for the construction of a cat piano, a piano in which the keys would be connected to the tails of cats, and their pulling would produce meowing sounds. Animal motifs were also employed in the creation of automatons by the French inventor and artist Jacques de Vaucanson: what goes into his metal duck through its beak exits through its body and is expelled through the cloaca.

Iconic automatons were constructed by the 19th-century French inventor Pierre Jaquet-Droz. They appear as aristocratic children and are capable of delicately writing words or drawing pictures with subtle movements. Japanese automatons from the 17th to 19th centuries, known as

"karakuri" (meaning mechanisms or tricks), were created for entertainment purposes and were used for serving tea.

One of the most well-known literary works exploring the relationship between humans and artificially created beings is the novel *Frankenstein* by English author Mary Shelley, published in 1818. Titled *Frankenstein, or the Modern Prometheus*, the book, written by the author at the age of 18, delves into themes beyond the Industrial Revolution, such as human hubris, the critique of playing God, and the emphasis on nature as a human refuge. It also addresses themes of solitude and the feeling of desperation within human society. The novel addresses the constant urge to improve humanity in the name of progress, but it cautions that without sufficient responsibility for one's actions and care, this pursuit can lead to destruction.

In the fantasy and gothic horror short stories of the German Romantic writer E.T.A. Hoffmann, such as *Automata* (1814) and *The Sandman* (1817), themes of automatons interweave with tales of alchemy. In a broader sense, these stories connect the world of scientific knowledge and progress with the supernatural, portraying scientists who construct automatons as both alchemists with magic and charms and as professors in the fields of physics and natural sciences. In the story *The Sandman*, the young manic student Nathaniel falls madly in love with an automaton named Olympia: "'Parting - parting!' he cried in wild despair; he kissed Olympia's hand, he bent towards her mouth, when his glowing lips were met by lips cold as ice! Just as when he had touched her cold hand, he felt himself overcome by horror; the legend of the dead bride darted suddenly through his mind, but Olympia pressed him fast, and her lips seemed to spring to life at his kiss" (Hoffman, 2021, p. 13).

Although his friend insists that her behaviour may resemble that of a human, she is nothing more than a wooden doll's face that "seems to act like a living being, and yet has some strange peculiarity of her own" (Hoffman, 2021, p. 14). Nathaniel falls completely under her "heavenly charms" (Hoffman, 2021, p. 13), despite her passivity compared to other women. Olympia, despite being full of perfection and grace, communicates just in an austere manner and moves mechanically. However, her passivity does not disturb him. Thus, he can read his own texts to her and feel fully heard. Amid a dispute between a physics professor (who pretends to be Olympia's father at parties), and a clockmaker/alchemist named Coppola/Coppélius, these two experimenters engage in a battle over the automaton. This ultimately leads to Olympia's destruction and Nathaniel's psychological breakdown.

In the short story *Automata*, E.T.A. Hoffmann delves even further into the exploration of creating artificial life and its examples. In the narrative, two young men go to see a mechanical Turk, who at the time raised many questions about mechanical dexterity. However, Hoffmann's mechanical Turk does not play chess like Kempelen's automaton (which concealed a chess player). Instead, it responds to the audience's questions (in the story, its sentences are likened to prophecies), leaving people puzzled about how such sophistication is possible.

The main characters visit Professor X———, who manufactures automatons, and witness a musical performance by mechanical musicians in female, male and child-like figures. In the room, they also observe mechanical clocks, and outside in the garden, they hear the elegant voice of an automaton who one of the students had been infatuated with in the past, when he heard her lovely singing at night and saw her getting into a carriage. Hoffmann's character can recognize that the automatic flute player is the same as the one created by the real-world constructor Vaucanson. The story also touches on the reluctance to accept such mechanical music as an art form: "The attempts of mechanicians to imitate, with more or less approximation to accuracy, the human organs in the production of musical sounds, or to substitute mechanical appliances for those organs, I consider tantamount to a declaration of war against the spiritual element in music; but the greater the forces they array against it, the more victorious it is" (Hoffman, 1967, p. 96).

It also expresses fear of or aversion to the intrusion of mechanization and unnaturalness into the production of true music: "'All that machine music (in which I include the Professor's own playing) makes every bone in my body ache. I am sure I do not know when I shall get over it!" (Hoffman, 1967, p. 95). A similar aversion was expressed by American scientist Douglas Hofstadter when he heard the music generated by EMI in the mid-1990s: "I was terrified by EMI. Terrified. I hated it, and was extremely threatened by it. It was threatening to destroy what I most cherished about humanity. I think EMI was the most quintessential example of the fears that I have about artificial intelligence" (Mitchell, 2020, p. 10). Hoffmann himself had a musical education, so this aversion can be read as his own negative stance. Interestingly, in the story, the first considerations about an automatic response generator, similar to chatbots, can be found. A character mentions that the Turk can read the very soul of the person asking him, evoke nuances of everything in human minds, and although they know that the automaton is only an external form of communication, they believed in "the remarkable cleverness of many of the Turk's answers" (Hoffmann, 1967, p. 89). The characters in the short story know that this reflects the technical

mastery of the inventor but still wonder how the Turk functions: “But how this is accomplished—how the being who gives the answers is placed in a position to hear the questions and see the questioners, and at the same time to be audible to them—certainly remains a complete mystery to me. Of course, all this merely implies great acoustic and mechanical skill on the part of the inventor, and remarkable acuteness—or, I might say, systematic craftiness—in overlooking nothing in the process of deceiving us” (Hoffman, 1967, p. 91).

Androids and robots in literary, theatrical, and cinematic works

The French novel *L’Éve Future* by Villiers de L’Isle-Adam, published in 1886, imitating the Pygmalion story but in a technological context, introduces the female android, created by the fictional Edison upon the request of a young man named Lord Ewald. The plot of this symbolic sci-fi novel, which popularized the term “android”, revolves around Ewald’s desire to replace his fiancée Miss Alicia Clary with an equally beautiful but smarter and more entertaining robotic version, a feat achieved through Edison’s technological mastery. Apart from being credited for literary experimentation, the novel also earned criticism for its misogyny, and it left a mark on 20th-century popular culture. A quote from it became the opening words of the animated film *Ghost in the Shell 2*: “If our gods and hopes are nothing but scientific phenomena, then it must be said that our love is scientific as well.”

Polish literary researchers Mariusz Pisarski and Bogumiła Suwara coined the term avatarism to root “the transfer of an essential attribute or a group of attributes from one entity to another in which the source of the transfer is represented at the destination point. The representing entity becomes an avatar which is an incorporation, embodiment, or representation of selected attributes of the source. Transferred attributes can be of conceptual, mental, or a material (genetic) nature” (Pisarski – Suwara, 2021, p. 145). Even though the new Alicia is described as an android, based on this terminology, she would be an example of avatarism par excellence, ordered by Ewald to transfer just a selection of his fiancée’s attributes, namely just her physical form, into a nonhuman body to replace her position in the real world.

The theatrical play *R.U.R.* by Karel Čapek, premiered in 1921 in Hradec Králové, no longer revolves around a man’s love for a perfect female being. Instead, after a robot revolution on Earth, it ends with hope for love between the robotess Helena and the robot Primus. We transition from

the sexualization and objectification of the female body to the theme of fear, which humanity primarily explores in the 20th century: the fear that an artificial body created by humans to serve them may acquire consciousness and, even more so, emotions. Although Čapek coined the term "robot", as he critically wrote, his robots were not mechanical dolls and a celebration of engineering but were created chemically. Čapek emphasized "elements of the discussion about the boundaries between the living and non-living, the natural and artificial, a context articulating its concepts through figures such as androids, puppets, mannequins, robots, and later, cyborgs and replicants"[2] (Horáková, 2010, p. 23). As Čapek wrote in a newspaper article, expressing his critical view against the mechanical aspect that the word "robot" evoked and clarifying his intention to create robots striving for a soul: "[t]he author did not intend to send into the world dolls made of tin, stuffed with gears, phototubes, and other mechanical gimmicks. However, it turned out that today's world does not want his scientific Robots and has replaced them with technical Robots; these are, apparently, the true representatives of our era; it is more fascinated by technical wonders than the miracle of life"[3] (Čapek, 1935, pp. 1-2).

Despite Čapek's efforts in his play to highlight far more metaphysical and emotionally charged aspects of life in its various biological and non-biological forms, the "age of machines", as it has been referred to in the last 100 years of our history, has enabled the flourishing of narratives about technological progress and its successes and failures. These narratives have transitioned from literature and theatre to a new artistic medium in the 20th century – film.

In 1915, Paul Wegener and Henrik Galeen wrote, directed, and starred in the silent film *Golem* (Gustav Meyrink wrote his novel *Golem* in the same year), which was part of a trilogy followed by the films *The Golem and the Dancing Girl* (1917) and *The Golem: How He Came into the World* (1920). Unlike the original myth, this adaptation includes a romantic subplot: the Golem falls in love with the daughter of an antique dealer, and the unrequited love leads to several murders.

A film that significantly advanced expressionist aesthetics on screen while connecting technological revolution with a socialist vs. capitalist charge was Fritz Lang's *Metropolis* (1927).

[2] prvky diskuse o hranicích živého a neživého, přirozeného a umělého, tedy context artikulující své koncepty skrze figury android, loutek, manykynu, robotu a pozdeji kyborgu a replikantu"

[3] „[a]utor nemínil poslat na svět panáky z plechu, nadívané kolečky, fotobuňkami a jinými mechanickými hejbly. Ukázalo se však, že dnešní svět nestojí o jeho vědecké Roboty a že si je nahradil Roboty technickými; ti jsou, jak zřejmo, pravá kost z kosti našeho věku; je víc fascinován technickými divy než zázrakem života"

The division of the world into two opposing poles – the heavenly skyscrapers with the Babylonian Tower, home to the city's chief architect and the wealthy, and in its opposition the gloomy, dirty underground, where the poor labour to keep the machines running – provides the backdrop for the stereotypical spark of love between Freder, the mayor's son, and Maria, a poor worker and revolutionary. The mad scientist Rotwang creates a humanoid replica of Maria called Futura to prevent the mixing of the "upper" and "lower" classes and maintain the status quo. The story slightly resonates with the narrative of *L'Éve Future*, except that Freder was supposed to be a victim of deception resulting from collaboration between his father and the scientist, rather than a willing participant in his own assignment.

The metaphor of a human as a machine also found its way into theatre in the 1920s, but in a different context from Čapek's. This was specifically evident in the work of Vsevolod Meyerhold and his theatrical biomechanics, which consisted of 16 exercises that actors had to master to control their bodies like machines. The director played the role of the constructor of commands that the actor's body had to execute. Meyerhold developed this principle in his Moscow production of *The Magnanimous Cuckold* (1922), where the entire ensemble of actors was perceived as a collective machine on stage, constructed from ladders, stairs, platforms, wheels and beams. The comparison of the actor to a machine was also utilized by the German choreographer, designer, sculptor and painter Oskar Schlemmer. In his Bauhaus productions *Triadic Ballet* (1922) and *Figurine Dance* (1926–1927), Schlemmer transformed the actor's body into a mechanical figure through costume.

Russian theater artist Nikolai Foregger is credited with the dance technique known as "tafiatreneage" (choreography presented as *Mechanical Dances* in 1923). Unlike Meyerhold's biomechanics, Foregger's approach wasn't just a training method; it was also an artistic form that directly represented technological progress, mechanization in production, and the automatism of operations. "Foregger's mechanical dance represents a pure mechanistic artistic form focused on the machine-like qualities evoked by the movements of the dancers"[4] (Horáková, 2010, p. 29, for more information on the portrayal of machines in 1920s theatre, see Horáková 2010).

Literary examples of metamorphoses between the human and the technological in the 20th century

[4] "Foggerův mechanický tanec představuje čistou mechanistickou uměleckou formu, zaměřenou na strojové kvality evokovované pohybem tanečníků"

"I ask myself, to no purpose, what is likely to happen to him? Can he possibly die? Anything that dies has had some kind of aim in life, some kind of activity, which has worn out; but that does not apply to Odradek. Am I to suppose, then, that he will always be rolling down the stairs, with ends of thread trailing after him, right before the feet of my children, and my children's children? He does no harm to anyone that one can see; but the idea that he is likely to survive me I find almost painful." (Kafka, 1971, online)

Odradek from Kafka's short story *The Cares of a Family Man*, narrated by a homodiegetic narrator, the head of the family, is a being whose ontological status has been the subject of much contemplation. As the narrator perceives it, Odradek takes the shape of a purposeless mechanical star with threads, yet it laughs with a laughter that can be produced even without lungs, and its dwelling is ever-changing. The narrator suggests that Odradek may have once been part of a complex form, so its purposelessness is a result of this loss, but he admits that he cannot say anything more about it because it "is extraordinarily nimble and can never be laid hold of" (Kafka, 1971, online). Odradek, as an automaton that at other points in the story appears as wooden when silent, stretches our interpretative possibilities with Kafka's imagination and the narrative gaps: it is a mechanical being that appears and disappears, it is a machine and at the same time perhaps a component of another machine, it answers some questions but mostly remains silent. Similar themes were also explored by two other cult writers in their short narratives, namely Herman Melville in *The Bell-Tower* (1855), where the story focuses on a post-human character of the bell tower's machine, whose element was the architect's blood, and Edgar Allan Poe in *The Man That Was Used Up* (1839), about the prostheses of a general's body.[5]

However, what remains in any interpretation of Odradek are human reflections on our own mortality and the machine that will outlive humans (even literally the children of our children) and the feelings of distinguishing the mechanical as purposeful and the human as an existence that was not created for a specific purpose. Odradek, which is purposeless, with its possible purposeful past unknown to us, is closer to humanoid notions due to its naivety and childlike perspective than other machines in artistic imaginations because it has its own attitude, intention, and was not created with the idea that its final form would have a current function. The sorrow of human mortality

[5] To explore other posthuman works from the Anglophone culture, refer to the book by Ivan Lacko *Prekrásny nový postsvet* (2021, pp. 28-30).

contrasted with mechanical permanence, expressed in the last paragraph of the story (and quoted at the beginning of the discussion of this story), leads us to the concept of "Promethean shame," as articulated by the German philosopher Günter Anders.

"Promethean shame", a concept introduced by Günter Anders in his philosophical book *Die Antiquiertheit des Menschen* (1956, The Obsolescence of Human Beings), stands in sharp contrast to artistic notions that, since Pygmalion's myth, place non-human entities made of clay, metal, chemistry and components in a subordinate position to humans, who create these beings either for their own pleasure and delight or for protection. Anders's thesis, on the other hand, portrays humanity as incapable of competing with machines, describing an anthropological crisis caused by technological development in the second half of the 20th century, in which machines appear to be more efficient and complete than modern humans.

Referring to feelings of powerlessness and emotional exhaustion in the face of artificial forces that have no doubt or malfunction (especially after the experience of world wars and atomic explosions) and the idea that humans will become obsolete compared to their technological "descendants", Anders proposes a "a new conception of human finitude based around our inability to see or comprehend the artificial powers we blindly place our hope in." (Müller, 2016, pp. 11). Anders argues that he has recognized a new human feeling: "Believe I have found the signs of an entirely new pudendum this morning; a form of shame that did not exist in the past. I will provisionally call it 'Promethean shame' for myself. I understand this to mean the 'shame when confronted by the "humiliatingly" high quality of fabricated things (selbstgemachten Dinge)'" (Anders, 1956, p. 23). Anders observed this shame when visiting a technical museum with his friend T. and described it as the difference between the physical clumsiness and imprecision of humans compared to the perfection of machines. He contrasts Promethean shame with the typical self-made man of the 19th century who viewed everything, including himself, as a personal achievement.

Anders perceives the mirror that scientific and technological progress sets up for people as a psychological stance toward the value, self-confidence, and self-love of humanity. He calls his approach "the philosophy of discrepancy," which involves analysing the differences between what we are capable of producing and our conception of it.

Cyborgs as mythological personifications of responses to historical challenges

Examples of artistic imagination illustrate, on one hand, the fear of the unknown, Freudian uncanny feelings that are associated with automatic beings because they are not "ours". On the other hand, they inject an element of romantic adventure that is evoked and provoked precisely by the "unknown". However, imagination materialized in narratives has predetermined philosophical contemplation and mechanical constructs. A similar tendency can be traced in algorithmic thinking and its implementations, from its beginnings in the 9th and 12th century to realizations in the 1950s. Since the 1960s, the sci-fi boom has moved from the realm of geeks to pop culture: robots, cyborgs, androids, and various forms of artificial intelligence presented from *Star Wars* to Asimov's stories and Dick's novels, such as in *Do Androids Dream of Electric Sheep?*, as well as in cult roles such as Johnny 5 or the Terminator, have filled the cultural space with the notion that AI is close, alongside the fear of its manipulation of humanity.

Viennese cyberneticist and literary experimenter Oswald Wiener, however, introduced the idea of a bio-adapter resembling some kind of shell or spacesuit that would save Central Europe and humanity as a whole. He described it as follows: "viewed from <outside>, the adapter places itself between the unsatisfying cosmos and the unsatisfied human being. it hermetically seals oft the latter from the traditional environment and in the first stage of adaptation only falls back on its own information, which it has stored for this purpose, or on that which the human being contains." (Wiener, 1965–1966, p. 6).

In the "appendix A" of his experimental work *die verbesserung von mitteleuropa*, Oswald Wiener outlines his bio-adapter as a means of connecting the human organism and a cybernetic device. Given the transhumanist approach, this connection can be termed as a cyborg, with the bio-adapter also playing a role in preserving human consciousness after death. The main function of this special interface is to adapt the human to the constantly changing external environment. The bio-adapter is supposed to provide an extension of consciousness and senses, the correction of any health complications, and the overall enhancement of humans. This description of the gradual merging of humans and a cybernetic interface resonated in Austrian literature in 1969, and it was reintroduced to an English-speaking audience precisely half a century later by Beate Geissler in the book *Oswald Wiener: The Bio-Adapter* (2019), with a foreword by the acclaimed Austrian media scientist Siegfried Zielinski.

As we have shown through examples of human imagination dating back to antiquity, where men dressed in Prometheus's skin to satisfy their romantic or protective needs, often ending

tragically, especially for those who desired or constructed robots, humanity has been artistically projecting its own technological dystopia for a long time. Various forms of science fiction stories since the 1960s have built upon myths, romantic sci-fi novels and expressionist theatre or film productions. From the 1950s onwards, we can also speak of robotic involvement in artistic endeavours, specifically the first cybernetic sculpture, *CYSP1*, created in 1956 by Nicolas Schöffer, originally from Hungary.

Technological imagination as the source of the culture of neural networks

The very concept of culture, which appears in the title of this article, is known for its challenging definability, ambiguity and irreplaceability. While recognizing all these risks and limitations, we use it, selecting from a wide range of theoretical concepts attempting to define culture one that is rooted in language and best suits our efforts for discursive and media critique.

Chris Barker understands culture as "a set of overlapping performative language-games that flow without no clear limits or determinations within the global whole of human life" (Barker, 2004, p. 45). He does not think of culture in the singular but rather of cultures in plural, that form "syncretic and hybridized products of interactions across space" (Barker, 2004, p. 45). This perspective applies also to the culture of neural networks. It is a relatively small cultural complex concerning the broader concept of culture, but it is dynamically evolving, drawing richly from cultural tradition, and developing its own logic, while contributing to the development of this logic with its own impulses.

The culture of neural networks is part of a set of cultural complexes or functionally interconnected subsystems, as Ansgar Nünning (2005, p. 112) would say, that share related cultural logic and language (for many of these complexes, there are already established terms: algorithmic culture, digital culture, network culture, etc.).

Language games through which individual cultures are formed always have an imaginative dimension. What sets apart the language games that establish the culture of neural networks is their connection with an archaic technological imagination that spans history and aims to create artificial minds or even artificial humans. One of the goals of our contribution is to draw attention to the connection between something seemingly new, such as artificial intelligence, and something as archaic as this imagination.

Through a chronological overview of selected design fictions, we have attempted to present the historical genealogy of the imagination that gave rise to the concept of artificial intelligence, or which the concept of artificial intelligence absorbed, appropriated and transformed into a scientific thesis. We now find ourselves in an era that seeks to bring this theorem into everyday life. However, the imaginative nature of artificial intelligence is often overlooked, and it should be remembered that it is an archaic dream, not a real construction. As Phil Turner has pointed out, people tend to ignore their technological imagination because they focus on solving specific problems or engaging in creative activities, forgetting that they are using tools that activate their technological imagination (or have grown from it) (cf. Turner, 2020, p. 123).

With this study, we wanted to emphasize above all that when we think and talk about artificial intelligence, we are discussing a set of ideas that should not be confused with reality. They should not deceive us or anyone else, let alone frighten anyone. We offer the concept of the culture of neural networks as a path to self-awareness of this imaginative process and its critical reflection.

Acknowledgement
This study is an outcome of the collective grant project VEGA 2/0163/22 "Literatúra v bioetike a bioetika v literatúre"/"Literature in bioethics and bioethics in literature."
This study has resulted from the Academic Prize awarded to Pavel Janoušek by the Academy of Sciences of the Czech Republic and from long-term support for conceptual development of a research institution; registration number 68378068. This work required usage of Czech Literary Bibliography research infrastructure resources (http://clb.ucl.cas.cz).
This paper was supported by Zuzana Husárová's Zdeněk Pešat Fellowship at the Institute of Czech Literature at the Academy of Sciences of the Czech Republic.

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