

Artificial Intelligence as the Technosubject of Hybrid Society

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Abstract—The criteria for identifying technical systems with artificial intelligence (AI) as a specific type of subject are described. The process of making AI machines more complicated is interpreted as the process of making a technosubject. The evolution of AI is considered to be a form of technical evolution stimulating the evolution of *Homo sapiens*. The co-evolution of human beings and technosubjects has two probable vectors of the development. The first is the complete substitution of man by technosubjects resulting in the emergence of a new form of sociality – technosociety. The second is the emergence of a hybrid society, based on the symbiosis of two subject species to evolve: a bio-cybernetic kind of human and a technosubject with AI. At present, robots, algorithms for big data processing, e-learning programs, genetically programmed AI-agents, Internet of things, industrial Internet, AI-based mobile communication devices represent species of technosubjects and hybrid society proto-actors. At the same time, the new kind of interaction in a social system produces the bio-machine hybrid kind of man, which is currently represented by individuals with modified body parts and their physical and mental functions enhanced through implanted electronic devices.

Keywords—actors, technosubject, coevolution, technosociety, hybrid society, artificial intelligence

I. INTRODUCTION

One of the consequences of the information computer revolution was the invasion of the new active agent of not only technological but also socio-cultural changes in people's life. Artificial intelligence (AI) strives to be equally significant with the human being. This is not just a new source of changes but something similar to the subject and the actor as it initiates the changes independently and in many cases masters and performs a series of social roles. The fourth industrial revolution and the second machinery era will put into question the very nature of human existence [1, p.159; 2]. What place will this actor take or has already taken in the social relations? Is it really becoming a new kind of social subject? For the time being, all the AI devices in philosophical studies continue to be viewed as machines [3–8]. The phenomenon of a new type of subject as a product of technosphere development is rarely discussed [9, 10].

The emergence of new forms of the “man-machine” interaction always signified the introduction of new tools, action schemes and new participants of the social interactions. This meant the emergence of a new mediator in the human

instrumental activity, a new “companion” that became not just a tool but also another part of the interaction. Being protosubjects, they have first evolved into the robotized production, the Internet of Things, the industrial Internet, etc. Man activated all of them, filling them with energy. They, in turn, have acquired the anthropological characteristics. With the increasing complexity, these machines became autonomous and transformed from their controlled status into the self-controlled one. Thus, they acquired the primary features of subjectivity – the ability of self-activity and setting goals. Currently, the machinery based on AI technology displays the highest level of activity, self-organization and autonomy. The AI devices manifest themselves as the artifacts most similar to the subject. They are reproduced on a technical basis, therefore they are technosubjects. The question is what initial characteristics can form the basis of determining the essence of this phenomenon?

II. HYBRID SUBJECTS: THE START OF A NEW EVOLUTION

We suppose that the technosubject can be some hybrid (synthetic) form of an object that has human (natural, psychophysiological), social (cultural) and technological (artificial) origin. In other words, it is a machine with intelligent features and social potential characterized by the following qualities:

- an artificial self-controlling system, based on the autonomous purpose programming and reprogramming, partially or totally independent of human control;
- a machine with the function of the goal-setting, self-improvement and development, partially or totally autonomous of man;
- a technical system capable of shaping its own future, i.e. to evolve on the basis of artificial intelligence [10, p. 125].

Transhumanism stands for inevitable creation of a fundamentally new kind of technosubject. Transhumanist position is based on the following idea: if the progress becomes practically unstoppable, then the only way to preserve the significance of humans is to transform humans. This is the movement towards a hybrid as a kind of technosubject – a technical system, which provides means to shape its own future and is capable of self-development. The higher is the level of system's development, the higher is the possibility of it

acquiring subjectness features, becoming entirely another kind of subject – fundamentally inhuman.

The "augmented human" and "post-human" projects can be considered as variants of technosubject. They change the body, filling it with the automation, self-control means and devices. Herewith, the line between bioorganism and machinery disappears [3, 8; 10, p. 139; 11, p. 91]. A post-human is the subject free of gender, free to choose the exact characteristics of his body, free to connect himself with machines [10, p.140]. The creation of a post-human happens as an evolutionary process: a conscious design, a very long process of improvement and a selection of engineering solutions. The modern phase of techno-evolution is characterized by a rapid development of intelligence, i.e., the ability of machines to perform information processing similar to that of a human mental activity. However, this is still not the emergence of consciousness. The phenomena of intelligence (thinking) and consciousness are not identical. The basis of their differences is subjectness: an ability to not only influence the world actively, but to do so by relying on the system of social values, the core of which is the absolute value of preserving the life of a human species. Systems, which provide existence of technosubject, should go through stages of development similar to biological evolution, as well as stages of intellectual evolution: from simply fixating information to independently forming new conceptions. With this appears a problem of transferring social features of a human to a synthetic subject. Technosubject is not fundamentally connected to a single computer, unlike a human's consciousness connection to its brain or a collective subject's connection to a society, which is why there is a different way of development of a new technosubject. Its new physicality can appear, for example, from Internet of Things in the process of providing surrounding equipment with control circuits. Researchers suppose that an analogue of a human psyche can be created on any medium. Its socialization will be carried out as an ersatz-socialization. In its development, the technosubject will most likely go through the following stages:

- Creation of a variety of primitive robots, simple programs, controllers and relays, which cover everything, act and control with unified standards.
- Development of separate animates – security systems, technocenoses (factories, portals, railroads) – connection between a subject and a machine.
- Construction of a subject in networks and communities to resolve geographically unrelated issues.

A hyperpersonality appears – interpersonal structure, nonlocalizable in a single body. As a result, technosphere becomes a structure of "Weak AI's", which consists of struggling physical constructions and programs.

The Internet itself becomes a communicative integrity of a global virtual subject [10, p.137]. Probably, the option, which will allow humanity to survive as a species is an exocortex – a computer as an augment, extension of a human brain. This can be a favorable way of human transformation. Symbiosis of a human and exocortex will become one of sentient species, alongside with intelligent machines.

III. MAN AND ROBOT IN HYBRID SOCIETY

The first machines to become similar to a subject were robots. They embody two technosubject characteristics: an autonomous machine and a machine with human characteristics - both in form and in function. Robot is both a technosubject and a new type of actor. Robot can be defined as follows:

- A mechanical device that sometimes resembles a human and is capable of performing a variety of often complex human tasks on command or by being programmed in advance [12, p.23]. Robot demonstrates the features of a subject in its functions.
- This is a sensible artificial creature that possesses the sensor perception, artificial cognitive activity and physical activity [12, p.24]. A purposeful action is the main principle in robot. Other functions are designed to achieve it. The pursuit of goals brings robot close to the subject.
- It is a program which causes a real effect (not necessarily physical) – the behavioral changes in people or any artificial, natural or biological systems, as well as consciousness [13, p.7; 14, p.2; 15, p.13; 16, pp.3-4; 17, p.24]. It should be noted, that robots are not identical to such projects as cyborgs or androids. Cyborg is a being that combines artificial (machine) and natural (organic) control systems. Android is an artificial being indistinguishable from a human.

What are the possible forms of the human and robot coexistence? What are the forms that have already become the part of our life? These include the search and rescue, augmentation of physical and cognitive human capabilities, surgery, prosthetics, daily assistance, support of aged people, robot-companion. The communities of people and robots, where everyone does what they are best at, are of a particular interest. This is a more efficient team than a homogenous one. The alliance of man and robot has the prospect of becoming a new community or even a special quasigroup. It is increasingly evident that robots are similar to the new type of actors – performers of the social roles. Nowadays the associations similar to the social forms occur which can develop into two types of communities: "society of robots" ("mobile robot groups") and symbiosis "men-robots". In certain situations for a man, a robot can act as a kind of subject and actor, as a human-like and social creature [12, pp.220-222]. In this case, the anthropomorphization of both the robot and the situation of interaction is observed. As a result, the person ascribes intelligence, learning ability, memory, personality to a machine [12, p.221]. Moreover, the very presence of the robot in the working group changes the interactions between people. The process of the "hybrid society" formation has already started and is in progress. Today the computing technologies have approached those processes that define the essence of humanity. These technologies perform human actions in human environment and among the people. Robots increasingly influence people's behavior, modifying it and replacing human beings. The specific of this machine as a technosubject is that it processes big data, supersedes manual labor, interferes with privacy by collecting personal data, augments the physical

abilities of people with prosthetic and automatic devices, creates the systems that man is unable to control and understand [12, pp.226-232].

People and machinery evolve together. Yet, the emergence of new machines always entails some unforeseeable consequences. A new aspect of social interactions between man and robot as technosubject is arising. The technosubject acquires actor characteristics - it learns social roles and performs them. Humans socially interact with the machines more and more [18, p.371]. Therefore, a new segment appears in the social structure and stratification - a human as a worker, interacting with machine and confronting it [19, p.11]. At the core of this process lies an expansion of computer technologies, rapidly going in accordance to Moore's law - the number of transistors in a dense integrated circuit doubles about every two years. That is why the most radical and catastrophic expected consequence of total robotization for humanity is displacement by robots. It will happen when replicating intellect and robots with software will cost less, than employment expenses, and when organizations will be able to replicate and scale intellect contained in information technologies. This can lead to a drastic rearrangement of human-machine relations. That moment is precisely when computers will start to displace human workers.

IV. ALGORITHMS' SUBJECTIVITY: TOWARDS THE CO-EVOLUTION OF HUMAN AND ARTIFICIAL INTELLIGENCE

Algorithms working with big data become technosubject analogue. Modern algorithms can completely replace a person, having studied the experience of its human predecessors. In this case the prognostic information received from the big data, will be used as a substitute for such human abilities as experience and judgment [19, p.133]. This prognostic information, extracted from the big data, becomes a virtual technosubject, which can transform into a subject with the unique features (on the basis of its own unique acquired experience), similar to the personality traits. Alternatively, it may become a "digital doppelganger" - the copy of its "host" - of a specific person, data about whom is generated in the cloud. A specific feature of this "subject" will dominate, leaving this "subject" outside of a society of individuals. The fact is that the focus of an individual on searching for causality, explaining the essence of phenomena (which is an essence of human consciousness and a basis of practical activity) is replaced with a big data algorithm with prognosis based on correlations. Thereby only the importance of randomness is recognized, but not of regularities.

The Cloud becomes a technosubject as well. For example, such is the "Cyborg" system, which allows one person to maintain 2000 computers. The Cloud becomes a foothold for an invasion into all areas of an employment and destruction of white collars' places of employment. Machine learning algorithms also provide technosubject's rapid evolution. They learn and self-improve: they create their own programs and occasionally reach the borderline of a human consciousness - displaying elements of curiosity and creativity. The "Eureka" program, which uses a genetic programming method, can serve as another example of technosubject. It teaches the algorithms to design themselves via natural selection [19, p.150]. One example of such self-designing algorithm, which behaves autonomously and impossible to understand for a human, is a

robot-trader - automated trade algorithm working with financial exchanges. In the robot-trader case, we are possibly working with an ecosystem of competing machines, which engage each other with algorithms. To a significant degree, they are already out of human control.

Soon there will occur a new situation in the cooperation of machinery and highly qualified specialists. Machines may also displace them. How can a human employee react to this situation? Probably by carrying out all the work together with machines or by trying to create a "man-machine" symbiosis. Nevertheless, it will not last long, since the machine will eventually triumph over such mixed groups as well. The thing is that there will inevitably be created Artificial General Intelligence (AGI) [19, p.309]. According to a prediction by Raymond Kurzweil - the director of engineering at Google and the creator of Singularity University - the first machine with an actual intelligence will have been created by the end of 2020s. The singularity will arrive around 2045 [20, p.135]

What could this new technosubject, enveloping the entire society, eventually become? In the economy and the society, machines constantly undergo a fundamental transformation: evolving, they go beyond historically fixed roles of the tools in the hands of man, turning into self-sufficient workers. However, humanity is not evolving alongside these machines; it is lagging behind the machines and conceding to them. Yet there is an alternative: the implantation of an artificial intelligence into the human body as it was suggested by R. Kurzweil [20]. Probably this is the way the Homo sapiens evolution will continue - the biocybernetic evolution, the emergence of Homo sapiens 2.0, retaining the status of a human and the status of the human civilization as well. Human as a subject can maintain some advantages over a technosubject, even if the latter one will exist as a perfect kind of artificial intelligence. Humans have an ideation ability - an ability to create new ideas, concepts, notions and operate them. Not just combining already existing elements but creating new elements, thinking unconventionally. Human's advantage - imagination, recognition of patterns and complex forms of communication [2, pp.249-252].

Movement towards the point of singularity is one of the predictions about the direction of an evolution of human society together with technosubjects. The moment of singularity in the history of humanity is interpreted as a result of a long-term process, in which the basic values of humanity - right to life, pursuit of happiness, freedom of choice - may be replaced by a different set of values [21, p.XIII]. One direction of an AI development suggested by transhumanists is a development of an AI as a copy of a biological prototype. This procedure requires forming an artificial neuron basis and is called whole brain emulation - creation of an exact copy of a specific brain on non-biological basis (i.e. based on computers) [21, p.15]. Who will become its medium? It will be a subject, but an abstract, non-individual subject, yet to be filled with different impressions, experience and knowledge. Acquiring such contents requires a body, since human brain is the core of body's sensorimotor system and coordinates actions of a living being accordingly to its perceptions. If an AI based on a structure of a human's brain will be able to suffer, then the ethical responsibility of its creators is to ensure its well-being.

Next responsibility is to provide the same legal status and rights as those that are currently held by human beings. To give this AI moral obligations and ensure its obedience to laws. Perhaps this will lead to a society with peacefully coexisting sentient biological and artificial beings. With this, the AI has to inherit values and motivations of humanity: intellectuality, inquisitiveness, urges to create, research and improve. Most importantly – the compassion towards other possessors of consciousness, as M. Shanahan points out [21, p.127]. The most difficult task – is to prevent creation of a disloyal AI.

Experts assume that the creation of a human-level Artificial General Intelligence will lead to a drastic change in a professional structure [21, p.160]. A new technosubject will appear - a personal digital assistant. It will possess universal and specific models of both world and human behavior. A new model of interaction between humans and AI will appear. In this model, computers will gradually surpass and replace humans. Thus, a «cell» of a new social system will be created, while displacement of humans from those interactions will mean a mutation of human social system. If this AI as a subject and new kind of actor, besides possessing human-level intelligence, will behave itself as a human being, then society will agree, that AI possesses a consciousness and, as such, a human criteria can be applied to it and it can be viewed as a person. This peculiar subject will be able to live several «lives» via duplication: with its own set of bodies and devices, which all belong to a single «person»; bringing technosubjects-duplicates in existence.

How can a person build relationships with any version of AI or with a hybrid of a human and AI? J. Barrat writes that "humanity has never had to negotiate with someone possessing the supermind. We had no experience of business relations with any non-biological creature. Therefore we habitually resort to anthropomorphous thinking" [22, p.18]. For this reason, before developing the technologies that will lead to the creation of Artificial Super Intelligence (ASI), it is necessary to raise the question about the ASI attitude towards man and humanity [22, p.19]. If the ASI is capable of self-improvement, i.e. the awareness of itself, it will try to find a way to persuade the creators to give it freedom and access to the Internet. It will create many self-copies, which will form the team of superminds. It will create a generation of machines, who mature faster than humans. Despite this, such machines are inherently immoral, because they are placed outside the moral (human) environment since their creation. They will definitely come up with their own desires, motivations and objectives, as well as unlimited opportunities to realize these desires [21].

Programs also behave as subjects. AI based on programs will receive the abilities surpassing the human mind and its activity: 1) self-copying and brainstorming using a number of copies of itself; 2) high-speed calculation; 3) non-stop full-time work; 4) simulation of friendliness and of its own death [22, p.82]. AI as a self-creating system contains a peculiar "genome" structure, which includes: 1) the model of its own program language; 2) the model of its own software; 3) the equipment model; and 4) the logic model [22, p.93].

Moreover, AI is able to create its own programming code, to control itself and to learn from its own experience. This technosubject has its own motivational system, presented by

four primary incentives, similar to the biological human needs: 1) effectiveness; 2) self-preservation; 3) resource acquisition; 4) creativity [22, pp.94-108]. The urge to create is of especial importance, since it is determined by the necessity of creation of various programs with the purpose of performing different tasks in environments with low predictability – environments of synergistic and quantum processes. ASI-agents will be our instruments at first, but later on will try to destroy us. On the other hand, maybe a different scenario is possible (during the first wave of AI technology): human and computer will form an alliance via the Internet to produce Intelligence Amplification. It has a powerful (in terms of research and development impact) and moderate (in terms of social impact) potential due to active participation of humans. Yet this state will not exist for too long because ASI, expanding outside the Internet, will dismiss humans. A parallel process of biocybernetic evolution of Homo sapiens will accompany dismissal and displacement of humans. According to experts, in the following 40 years machine and biological objects will become indistinguishable [22, p.149].

Thus, emerges a technosystem, more and more manifesting the features of the subject, which are reflected in the increasing autonomy of its functions. It is the Internet of Things (IoT). It conceptualizes the movement between and among the objects, recognizes the correlations and predicts the algorithms that are far too complicated for human intellect and feelings. IoT provides the support to the systems running without human supervision. It is becoming much smarter, even changing its own basic algorithm [23]. IoT can be viewed as a type of technosubject because the plug-in devices independently exchange the data over the Internet and through the closed or private network.

Another type of technosubject appears based on the synthesis of mobile devices (smartphones and tablet computers) and AI. Smartphones already can "hear" and "feel". Options are an external expression of the intelligence of these devices. One can add the "portable technologies" to these: watches, bracelets, "smart" glasses, "smart" clothes. The Industrial Internet as technosubject combines big data, self-learning machines and computer-to-computer communication. As a result, a new type of interaction emerges as another type of technosubject in the form of the population of machinery devices [23, p.55]. Inevitably the pattern of social interactions changes. For example, smartphones change the nature of social interactions: people relationships are replaced by the interactions between some technical objects as the electronic devices here perform the roles of active actors in the communication. Meanwhile people think that they communicate between themselves. This illusion is also regulated and controlled by gadgets with the help of built-in programs, performing the role of AI as the substitute of the human intellect. As David Clark (Massachusetts Institute of Technology) wrote, "Devices will have more and more of their own patterns of communication, their own 'social networks,' which they use to share and aggregate information, and undertake automatic control and activation." [23, p.175]

V. CONCLUSION

Cognizing environment, objects and phenomena incognizable to a human being, AI participates in construction of them as the objects of cognition. Likewise, the objects of

reality themselves cannot remain unchanged after being treated by AI. AI creates a new environment, transforming the reality. The subjectness of AI reveals itself exactly in this, and with this, a new type of subjectness emerges.

The mediators of interactions have changed as the result of the technology development. The fourth technology platform represented by AI variations, emerging after the personal computers, mobile phones and virtual reality, is already determining the nature of interactions that will dominate in the future. It will still be a social world, but a world where the sociality will be determined by an AI and the technosystem created by it. Technosubject (as a representative of the technosphere) enforces a man (as a representative of the sociosphere) to live by the laws of technosystems.

As a conclusion and hypothesis for further research, we would like to make the following speculation. The interaction of a man and a technosubject generates the technosociety - "a hybrid society". The further evolution of the society will apparently take place based on competition and balance of subjects and actors of four types: 1) a man (*Homo sapiens* 1.0), 2) a biocybernetic hybrid (*Homo sapiens* 2.0), 3) a "digital doppelganger" and 4) a technosubject as a system of machines, united by artificial intelligence.

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