# SOCIOLOGY AS A SCIENCE: NEW CHALLENGES OF THE 21ST CENTURY

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**ARE SOCIOLOGISTS READY FOR 'ARTIFICIAL SOCIALITY'? CURRENT ISSUES AND FUTURE PROSPECTS FOR STUDYING ARTIFICIAL INTELLIGENCE IN THE SOCIAL SCIENCES**

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ГОТОВЫ ЛИ СОЦИОЛОГИ К АНАЛИЗУ «ИСКУССТВЕННОЙ СОЦИАЛЬНОСТИ»? ПРОБЛЕМЫ И ПЕРСПЕКТИВЫ ИССЛЕДОВАНИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА В СОЦИАЛЬНЫХ НАУКАХ

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**Abstract.** Current sociology doesn't have a settled view on what to do with a phenomenon that in the literature has been titled as "artificial intelligence" (AI). Sociological textbooks, handbooks, encyclopedias, and sociology classes' syllabi typically either don't have entries about AI at all or talk about it haphazardly with a stress on AI's social effects and without discerning the underlying logic that moves the prodigy on. This paper is an invitation to a professional conversation about what and how social sciences can/should study "artificial intelligence". It is based on a discussion of the preliminary results of an on-going three-year research project that has been launched at the ISA Congress in Toronto. The paper examines AI in relation with 'artificial sociality'. It argues that research on AI-based technologies is flourishing mainly outside established disciplinary boundaries. Thus, social sciences have to look for new theoretical and methodological frameworks to approach AI and 'artificial sociality'.

**Аннотация.** В современной социологии не существует ни однозначной трактовки феномена, определяемого как «искусственный интеллект» (ИИ), ни устоявшихся подходов к его изучению. Социологические учебники, энциклопедии и учебные программы либо не упоминают искусственный интеллект, либо обсуждают его поверхностно, в связи с другими сюжетами и не рассматривая внутреннюю логику, лежащую в основании технологий ИИ и особенностей их распространения в повседневной жизни. Статья является приглашением к дискуссии о том, каким образом социальные науки могут/должны изучать искусственный интеллект в связи с развитием «искусственной социальности». В ней представлены результаты первого этапа трехлетнего исследования, который был реализован в рамках XIX конгресса Международной социологической ассоциации. По результатам анализа авторы приходят к выводу, что исследования технологий ИИ в социальных науках развиваются, преимущественно, вне привычных дисциплинарных границ. Таким образом, социальные науки стоят перед необходимостью поиска новых теоретических и методологических оснований для изучения искусственного интеллекта и «искусственной социальности».

## Introduction

The classic definition of a human being at least since the Enlightenment has been 'Homo Sapiens'. The term focuses on rationality / reason as a distinctive characteristic of the species. However, from the mid-XX century, the privilege of human reason has been contested by 'artificial intelligence' (AI)[1]. Moreover, the reliance on technology in everyday life questions 'human exceptionalism' [Schaeffer, 2007] not only in relation to rationality but also regarding humans as social, emotional and interacting beings. One of the main trends in the development of AI is that it is becoming increasingly social. In the 1940s and 1950s the AI theme was focused on solving instrumental problems such as proving mathematical theorems, manipulating objects, translating between languages, and completing different types of practical computations. Today however, AI becomes the medium and the participant of interaction among human beings.

This paper aims to map and to evaluate social science research on the diffusion of AI technologies into the everyday life of a society. We will begin with a definition of the problem, a brief statement on the state of affairs in the field, and formulate some hypotheses concerning this state. Then we will describe the theoretical framework, the methods, and the outcomes of an empirical study conducted during the XIX ISA World Congress, Toronto, 2018 as a part of an on-going three-year research project. The paper's final section presents basic conclusions of our research with regard to further developments in the field.

New processes and revolutionary changes in science, information technology, and robotics not only make AI a reality of everyday life but transform it into a new form of sociality. It can be referred to as **'artificial sociality'** [Rezaev, Starikov, Tregubova,

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[1]  The paper does not seek to contribute to the discussion on what artificial intelligence is and in what sense it is possible. Rather, we refer to various technologies that already exist and are typically labeled as 'AI'. As a basic definition of AI, we use a common definition that is presented in the dictionaries. The comparison of definitions from the Oxford dictionaries (URL: https://en.oxforddictionaries.com/definition/artificial_intelligence; date of access: 03.10.2018), the Encyclopedia Britannica (URL: https://www.britannica.com/technology/artificial-intelligence; date of access: 03.10.2018), and the Merriam-Webster dictionary (URL: https://www.merriam-webster.com/dictionary/artificial%20intelligence; date of access: 03.10.2018) demonstrates that «artificial intelligence» is treated in two ways: as a research on special kind of computer / machine performance and as the performance itself. Its definitive feature is performing tasks / imitation of behavior that is commonly associated with human (or animal) intelligence, such as visual perception, speech recognition, decision-making, language translation, making generalizations, and so on.

2018; Rezaev, Ivanova, 2018][2]. Three quite different yet related types of phenomena characterize developments that bring 'artificial sociality' to the fore. The first is human to human interactions that are mediated by machines, for instance, in social networks. The second is human to machine interactions: from programmers to technical support personnel, from users at work to children playing games. The third is computer to computer communication.

Sociality is the specific attribute of human beings characterized by the ability to enter into social interaction, which implies meaning-making, complex emotional dynamics, formation of relationships and sustained communities, and, simultaneously, the construction of the Self [Wolfe, 1993; Turner, 2002]. The social nature of AI could be conceived of in two ways: 'Strong' and 'Weak'. 'Strong' artificial sociality does not yet exist; however it would consist of the ability of AI to interact spontaneously and to be emotionally involved in interaction. 'Weak' artificial sociality is the empirical fact of the AI's participation in various social interactions, and it is currently enjoying a period of expansion.

The development of 'artificial sociality' led to the emergence of new phenomena that affect the ability of people to interact and to sustain relationships. The permeation of these phenomena into everyday life is increasingly drawing the attention of scientists, journalists, artists, entrepreneurs, and ordinary users. Since the 1980s, scholars have been discussing in what sense and how exactly AI could/should be a research problem for the social sciences [Wolfe, 1993; Schwartz, 1989; Woolgar, 1985; Bainbridge et al., 1994]. Several features could be distinguished as characteristic of the current state of affairs in AI studies in general and in research on 'artificial sociality' in particular [Rezaev, Ivanova, 2018; Rezaev, Starikov, Tregubova, 2018].

First, the views concerning AI in society have changed dramatically over the past half a century. Immediately after World War II the importance of AI seemed to be of interest only to philosophers who engaged in meta-theoretical discussions on the reality of artificial intelligence *per se*. By that time, a generation of philosophers had systematically documented and supported two contradictory conclusions: 1) AI can be and will be a reality very soon; 2) AI cannot be and will never be a reality. This situation has changed in the last quarter of the 20th century. AI has become a subfield for computer science that involves design of computer programs and of automated equipment, such as industrial robots, in ways that at least resemble human thought processes [Barr, Feigenbaum, 1982; McCorduck, 1979].

AI studies at their beginning were *anti-disciplinary* in nature: the idea and ideology of reproducing and overcoming human capabilities broke disciplinary boundaries that analytically divided human existence into separate subjects (see, for instance, interview with Terry Winograd [An Interview…, 1991], one of the pioneers of AI). Anti-disciplinary projects are not inspired by intradisciplinary debates or by difficulties in 'translating' concepts, methods or conclusions from one discipline to another. These projects emerge when the original research problems concerning truly new and evolving phenomena exist.

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[2]  The term 'artificial sociality' was coined by a German research team led by Thomas Malsh [Malsch, 1998; 2005]. Malsch considers 'artificial sociality' as a communicative network, the participants of which are not only people but also AI-based agents, with the Internet as the communicative environment. Our understanding of 'artificial sociality' is broader: it embraces all kinds of interactions where AI technologies participate as agents and / or as a medium of interaction.

Second, the majority of publications in comparative perspective are developed in engineering and computer sciences, and, to a lesser extent, in philosophy and psychology. Thus, currently, the fields of AI in general and 'artificial sociality' in particular are dominated by three major disciplines — computer science, psychology, and philosophy (see [Boden, 2016] for a brief description of research trends in the fields).

Third, for the social scientists, the computer, on the one hand, is a society's technological product, and on the other hand, is a source of technological progress and hence a source of social change. That was the case in the 20th century when debates on the post-industrial society flourished, and is still the case in the 21st century when ideas of 'digital society' and post-human evolution spread across scholarly disciplines.

Fourth, what is most striking about the sociological literature on AI is how limited it is. New notions have appeared in sociological discussions in recent years. However, these notions are restricted to quite a narrow circle of technical terms that have been introduced in our daily life, such as the 'Internet', 'networks', 'cyber', 'digital', 'social media', and 'new media'. Sociologists adopt these terms in their studies and simply combine them with the term 'society' to continue discussions under the respective rubrics of 'Internet Society', 'Network Society', 'Digital Society', 'Cyber Society', 'Social Media Society', and 'New Media Society'.

Finally, computer and software revolutions brought to the forefront a number of entirely new scholarly disciplines, which, interestingly, cannot be studied without new technologies, namely computers and software. These disciplines are digital humanities, and the studies of the Internet, cyber-culture, new media, and gaming, to name a few. These and other newcomer fields require much more attention from theoreticians in sociology and other social sciences.

Thus, the current state of scholarship on 'artificial sociality' gives quite a modest role in studying this phenomenon to the social sciences. What kind of interdisciplinary boundaries characterize the field of 'artificial sociality' in the social sciences? What are the main characteristics of research on 'artificial sociality'? And what are the directions for further developments?

To answer these questions two **hypotheses** were formulated and explored:

I. The field of studying 'artificial sociality' is multidisciplinary in the sense that scholars in sociology, psychology, communications, engineering, computer science, and other disciplines study AI and are interested in each other's work. Nonetheless, research is still done predominantly in each investigator's own intellectual tradition. Scholars from different disciplines bring various assumptions, research practices, understanding of concepts, and theoretical schemes to the field [3].

II. There is no professional connectedness among social science scholars who study AI. Research topics, problems, and definitions do not reference each other, and the body of well-established findings has yet to emerge.

## Methods

To test the hypotheses, we collected and analyzed expert interviews with researchers who study various phenomena of 'artificial sociality'. The study presented in this paper is

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[3]  For instance, the very concept of 'intelligence' in 'artificial intelligence' — obviously the most fundamental notion in the field — has different meaning and interpretation for different scholars which complicates further research.

the first one of a series of comparative case studies that we are planning to conduct with experts from different research fields who are engaged in research on the influence of AI technologies on the everyday life of people. The organizational base for this study was the XIX ISA World Congress in Toronto, Canada, July 2018. The Forum is a large scholarly meeting that brings together, according to the Congress' Program[4], about 6500 participants from different countries in more than 1000 sessions and other academic events.

In this study, we decided to focus primarily on sociologists for two reasons. First, we believe that a sociological viewpoint is highly promising for studying new characteristics of human sociality. It relates to both the macro-effects (e. g., digital divide in different societies, facilitation of transnational migration by web-based technologies, social implications of labor market transformations) and the micro-patterns (e. g., collective behavior on the Internet, changes in the emotional dimensions of interactions, the conditions for sociable robotics). Second, as indicated above, sociology has not studied AI phenomena sufficiently, if at all, so every step in this direction will be worth doing.

The scope and the trends of the interests of sociologists in studying 'artificial sociality' could be preliminarily traced in the XIX ISA Congress Program. Among numerous scholarly events of the ISA Congress, several are devoted to the issues of influence of new technologies on society. The Program detects both the interest in the new phenomena and the lack of its sociological institutionalization. The sessions described in the Program use diverse terminology and are organized by different research committees and groups; topics of some sessions seem to overlap. Session titles and descriptions mostly contain the term 'digital' and embrace both the theoretical and the methodological challenges of research[5] as well as the specific topics focused on the elderly, youth, labor, collective action, family, etc[6]. Other sessions concerning 'artificial sociality' refer to technology/design[7] and to social media[8]. Moreover, a quick look through the presentations demonstrated that not all of them fit well into session themes, while several presentations that discuss 'artificial sociality' phenomena are included in the sessions which do not deal with this topic specifically. Thus, sociologists' interest in 'artificial sociality' is diffused and is probably in the process of institutionalization.

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[4]  URL: https://www.isa-sociology.org/uploads/files/isa-wcs2018-program-book.pdf (date of access: 03.10.2018).

[5]  «Digital Sociology and Sociological Theory: Intersections and Divergences», «Digital Technologies, Culture and Society», «Digitalization and Societal Innovation: One Shaping the Other», «Real Life Sociology: Understanding Society in a Digital Age», «Digital Sociology: Perspectives on Research, Methods and Concepts», «Communities and Digital Media in a Networked World».

[6]  «Conflictuality in the Digital Space: What Are the Challenges for Military Organizations?», «Studying Family Life, Digital Technologies, and Social Media: Perspectives and Methods», «Ageing and the Digital: Key Themes, Future Agendas», «Socio-Gerontechnology — Theorizing the Digital Life Worlds of Older People», «Young People and New Political Creativity in the Digital Age», «Digital Labor I — Changing World of Work and Employment Relations in the Era of 4th Industrial Revolution», «Digital Labor II — New Forms of Enterprises, of Collaborations and Work in the Digital Economy», «Organisations, Work and Society», «Digital Experiences and Narratives of Networked Activism», «Collective Action in the Digital Age», «Towards a Sociological Critique of Digital Health», «Surveillance, Power and Justice».

[7]  «The Future of Science, Technology and Innovation in a World in Turmoil», «New Principles of Designing Social Systems and Social Realities», «Aging with Technology: Barriers and Opportunities», «Mobile Communication and Leisure Practices in a Connected World», «Cyber-Criminology: Understanding the Impact of Technologies on Deviant Behaviours Online and Offline».

[8]  «Social Media and the Military», «Fake News Is the Invention of a Liar», «Globalization, New Media and the Culture of Real Virtuality: Emerging Patterns».

Many scholars have started to inquire into the diffusion of sociological views on AI and 'artificial sociality' but they still cannot manage cooperation or find common ground for the discussion.

The sample of experts for our study was recruited through the following steps. Initially, we selected 35 abstracts from the Congress Program that are directly related to the issues of 'artificial sociality'. The search for abstracts was organized using words «artificial» and «digital» in the titles of abstracts and sessions. Then, we sent 33 letters to the authors of the chosen abstracts using the e-mail address listed on the web page of the researcher (mainly on the official web pages of the universities where the authors work). E-mails couldn't be located for the authors of two abstracts. Finally, we arranged interviews with the authors of nine abstracts who agreed to participate in the project. As a result, during the XIX ISA Congress we conducted nine expert interviews with ten respondents (one of the interviews included two experts)[9], who represent scholarly organizations from Canada, Finland, India, Italy, Netherlands, Norway, Poland, Russia, and the USA. Interviews lasted from 12 to 40 minutes. The interview materials are made anonymous in the analysis that follows.

## Analysis

The experts have diverse research interests and organizational affiliations. How did these ten people meet at one place, the ISA Congress, and do they have anything in common? In the following analysis, we seek to address this inquiry by answering the following questions:

1. Who are these people? From what standpoint do they research the issues of 'artificial sociality'?
2. What are the main research problems? What are the main troubles with the usage of AI technologies in a society according to the experts?
3. What types of divisions (disciplinary, national, generational, conceptual, etc.) exist in their research activities?
4. How do social scientists see the difference between AI research in social sciences and humanities, and in computer science and engineering?

As the sample was designed on the basis of the ISA Congress Program, we expected to take interviews mainly with sociologists. To our surprise, only half of our respondents considered themselves sociologists, and only three of them identified themselves exclusively as sociologists without further qualifications. Going deeper into the research activities of the participants revealed an even more diverse picture. Instead of one sociological field we encountered several 'blurred' domains covering parts of different disciplines and interdisciplinary projects.

One of these domains is **policy research**: two interviews fall into this category. Policy research is guided by practical issues and difficulties that accompany the implementation of digital technologies. Typically, it is supported by governmental funds. The focus here is on the social consequences of the use of digital technologies which are unforeseen by the engineers and computer scientists who create them. The division of labor, as one of our informants put it, looks as follows:

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[9]  We would like to thank Anastasia Ivanova and Valentin Starikov for their help in organizing and conducting interviews.

> *Because we are from the humanities, we do not do research in artificial intelligence, we do not have the laboratory requirements to meet those challenges. Our collaboration comes in when they [computer scientists and engineers] want to design or they have already designed, and then they call for a meeting and tell us: «where can we apply this?» or «what would be the challenges, if we design and apply this…» — they want a response. That is where we step in. (Int. 1)* [10]

Practitioners in policy research have various disciplinary backgrounds (sociology, communication studies, political science, nursing, and so on). However, scholarly disciplines serve only as methodological (and also ideological) toolboxes for conducting research that is primarily directed by the practical question: do new technologies make people's lives better or worse? In regard to this question, sociological views manifest themselves in two primary ways. First, researchers consider the population of the countries under study not as a whole, but as a set of different groups (urban and rural, literate and illiterate, young and elderly, etc.). Analytic division of nations into groups with different interests, values, and behaviors is typical for classical sociological research and descends, in different versions, from Marx's, Weber's, and Durkheim' s visions of society. Second, there is an underlying expectation that the implementation of new technologies will be good for the privileged groups and not so good for others, thus deepening social inequality.

Similarly, topics in policy research embrace descriptions of how different groups of people use new technologies and how they feel about it. These accounts are highly valuable from the standpoint of the social sciences as they provide a rich body of descriptive empirical data on 'artificial sociality'. Nevertheless, the transition from answering the research question about the positive or negative consequences of a particular technology, to the exploration of the ways in which people interact with it, is complicated and not so obvious. Thus, the large body of empirical findings in policy research requires way more effort in conceptualization, generalization, and comparison to be integrated into the more abstract social science disciplines.

Another domain is **disciplinary research**: three interviews fall into this category, two with sociologists and one with a historian. Specifically, by disciplinary research we mean scholarly investigation that is (mostly) governed by intra-discipline discussions and uses conceptual vocabulary and methods of one specific discipline. However, the rigidity of disciplinary boundaries is relative. One of the sociologists we interviewed works on a multi-disciplinary research team; the other one is both a sociologist and a media scholar; the historian specializes in sociological and economic history.

For all the experts in this domain the interest in AI-based technologies comes from the extension of other research topics and problems relevant to their disciplinary field. Another reason is (at least, for sociologists) «*to follow the money, which is where the money comes from for research*» (Int. 4). It is because research on new technologies is now extensively supported by various research funds. However, in contrast with policy research, disciplinary interests determine what is under investigation. For sociologists, the approach to understanding the implementation of new technologies is

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[10] Interviews are numbered according to the order in which they were taken. All the interviews, except for the Interview 8, were conducted in English. Interview 8 was conducted in Russian; its fragments are presented in this paper in our English translation.

now influenced by the motto «*technology is affecting sociability and social relations*» (Int. 6). In other words, what is the place of online interactions in our web of relations, in sustaining communities and trust, and how does the existence of new algorithms influences economic exchange, cultural production, and consumption. For the historian, the development of AI is to be treated through the lens of the history of rationality. Positive or negative evaluations and concerns for technological development may accompany these reflections, however, they are not at the core of the research.

Three more interviews represent the domain of **interdisciplinary research**. Unlike disciplinary research, here scholars combine visions and perspectives of different disciplines to study phenomena connected to the widespread diffusion of new digital technologies. Interdisciplinarity might manifest itself as a condition of being «in-between»:

> *I really like looking for a mixture of things. And I can't really code but I can talk about coding, I'm not a psychologist but know a bit of their terminology, and I'm not a sociologist, but I've read a little bit of that… I like being a bit confused and lost, not all the time, but often. (Int. 2)*

It might also be considered as a combination of different perspectives:

> *Q.: And here, at the sociological congress, do you feel yourself comfortable, like at home? I mean…*
> *A.: Yes, I understand. But I also go to other conferences, where there are psychologists or organizational scientists, where I also feel at home. (Int. 7)*
> *I started off in philosophy and philosophy of logic, mathematical logic at a very early age. And I saw that is the beginnings of everything… I didn't start off majoring in AI because… [it was impossible]. But it grew out of philosophy, psychology and industrial organization. <…> I've been publishing since the late 1980s and I have been construed as a cultural theorist. (Int. 5)*

Instead of disciplinary boundaries, the interviews pointed to specific interdisciplinary research fields: the study of digital technologies in education, digitalization of labor, and science and technologies studies (STS) based on AI. These fields inquire into specific phenomena using perspectives from different disciplines; however, they have boundaries both in terms of what disciplines are typically involved, and what kind of scholarly discussion is being developed. There are several examples of research problems involved in interdisciplinary research:

— «*how theories of instruction [in education] are turned into material forms, new lecture halls, or the use of certain apps or software*» (Int. 2);
— «*when we talk about technology, what should be included in the definition*» (Int. 2);
— «*to have AI invested deeply into systems, for example, that of automated vehicles, with long-term space projects, one will need the type of coordination between human beings and the systems that were projected earlier by the pioneers [of AI]*» (Int. 5);
— «*what is needed to guarantee the social welfare and economic welfare of the society in relation to new technologies, which new technologies will emerge and how they will affect the economy and work*» (Int. 7).

These problems are quite different from policy issues as they go beyond the normative questions. They also differ from the narrow disciplinary research problems as they rely on a broader conceptual vocabulary of material/digital, technology, labor, and

human-machine collaboration. Moreover, each of these interdisciplinary problems is framed in the lasting scholarly discussions: whether material and digital activities could/should be regarded as separate, and how digitalization of labor influences labor markets and unemployment, etc.

The last domain can be labeled as **transdisciplinary/anti-disciplinary research**, and only one interview falls into this category. In contrast to other domains, the research questions here address the emergence of phenomena that seem to be radically new, and thus could not be conceptualized properly by the mainstream scholarly discourse. As we noted above, from its very beginning, AI research was anti-disciplinary, then it spread into different fields and disciplines. In our interview, transhumanism is the domain of anti-disciplinary research:

> *So, there were people coming from different disciplines, but they were all focusing on one topic, which is self-directed evolution, how technology changes humans. … So disciplines were somehow considered irrelevant, in the sense that we were not discussing using the same methodology, everybody was trying to extrapolate the possible development of human starting from their own perspective, but still, we could understand each other. (Int. 9).*

The key here is one idea — self-directed evolution — that organizes both perceptions of diverse empirical phenomena and the applications of different disciplines. In the case of transhumanism, the study of AI and its everyday usage is one of the key issues, because the emergence of AI is regarded as the crucial step in evolution. Anti-disciplinary research always starts as marginal in relation to the established boundaries (as indeed was the case with AI research). However, the transhumanist movement is becoming more popular both in mass culture and in mainstream science: «*I think that people involved in this transhumanist movement, they develop a common vocabulary, which now is also used outside. And today, for instance, I could hear other people using these terms, even sociologists*» (Int. 9).

The range or research topics and reference points in anti-disciplinary research is diverse: the 'anything goes' principle promotes the elaborating of original ideas. According to the interview, research interests of the expert embrace both narratives about the future and the transformation of labor, including social robotics, and references are made to different figures, from Anthony Giddens to the chief economist of the Bank of England. Like policy research, anti-disciplinary research starts from what is happening now. Unlike policy research, however, it is focused on new phenomena *per se*, not on their consequences on the society. Anti-disciplinary research also holds optimism for negotiation of disciplinary conflicts and dissemination of its own ideas.

The four domains highlighted above are ideal types that were constructed based on the interviews. Qualitative research does not allow to make conclusions on the prominence of these types of domains among researchers involved in sociological / social science work on 'artificial sociality'. However, we should note that disciplinary research constitutes only one of the domains, and research on new technologies exists mainly outside (or between) disciplinary boundaries.

Moving from the specific domains to general tendencies we need to raise the following question: what are the topics and structure of social knowledge on 'artificial sociality'?

As we have observed, research topics and projects mentioned in the interviews are quite diverse, however, there are three main trends. First, scholars focus on the change, on social transformations connected to the spread of AI-based technologies. Our respondents regard these changes as significant, but their assessments vary from moderate to radical:

*It's changing, it's transforming relations, yes, we can say… But we have a core of our relations that… it's still our traditional relations that we used to use to have in a village, for instance. (Int. 6)*

*Some of these transformations are radical. … But what will remain is where there is work where the interaction between individuals and people is necessary, that cannot be automated very simply. (Int. 7)*

*These machines, the software and the hardware, become more and more sophisticated, and at the point, it will be hard to distinguish… software from a human. (Int. 9)*

Second, the researchers agree in arguing against technological determinism. Implementation of new algorithms and devices is driven not only by their technical characteristics but also by people and their social relations, «*other factors like culture, religion, social stratification [that] may have an impact on technology, shape technology*» (Int. 9).

Third, despite a variety of research topics, the dominant one is the transformation of work and labor under digitalization, its social consequences, and the narratives about it. Almost all the interviews mention some aspects of labor transformations: the change in jobs, production, exchange, and consumption.

Besides research problems, many experts expressed concerns about social consequences of AI development. These issues fall into two main categories: reproduction/growth of inequality, and the loss of privacy and control. On the one hand, failure in the use of new technologies makes it necessary to protect the disadvantaged and to look into the negative side of technological change. This is how it was noted, «*some of these innovations are… the dark sides are intending because they are okay for the majority, this is for the best, people like banking on the net, and they don't take into the account the losers in some sense*» (Int. 3). On the other hand, when innovation is successful there is a risk of compromising privacy and losing control of one's personal information: «*…the property of data, how these data are managed and used: they can be used for the better, for understanding how it works, but they can also be used for bad. So I think that the use, and the property of data which is now in the hand of some corporations, it's a really big deal…*» (Int. 6).

The experts also provide reflections on the structure of sociological knowledge within the framework of studying AI-based technologies. There are two main aspects that can be identified here. One is the internal divisions in sociology and related disciplines, another is interrelations with computer science and engineering.

Above all, sociology appears to be a relatively conservative discipline that has not paid and is still not paying enough attention to new technologies. Research on 'artificial sociality' is positioned as something innovative but not yet mainstream:

*…at one point, sociologists thought that it was just, you know, small beans on the side, that communication and digital media were not to reshape the entire society, and therefore… I would say a lot of that has to do with snobbism… The Internet research at the beginning was for cuckoo people. And then, when the Internet picks up, and when platform became*

*more important, it was already too late, because the field of communication shaped rapidly and with a really strong background into actually philosophy and not sociology. (Int. 4)*

*…some sociologists tend to think that looking online, or the Internet, or Facebook, is just blah-blah and that it's not serious, it's not a real work, it's leisure. (Int. 6)*

*My experience of talking about this subject [history of AI] to anthropologists and sociologists is quite depressing because people simply don't understand… (Int. 8)*

Another division concerns the role of sociology for non-sociologists. On the one hand, sociology provides a theoretical framework for those who come from policy studies and applied research: «*I don't have any formal training in sociology; we do study a lot of sociological theories in communication, because communication is an applied field, it draws from various fields*» (Int. 1). On the other hand, for people with a background in philosophy, sociology is associated with collecting and analyzing empirical data: «*I have such reverence for people who are pure sociologists and people who have qualitative and quantitative skills that are needed for the PhD in sociology*» (Int. 5). Thus, sociology lies between applied research that lacks theory and theoretical research that lacks empirical data. This position is simultaneously promising and vulnerable because there is a question of whether sociological perspective *per se* exists beyond philosophy and applied research [11].

Two more observations should be made about disciplinary boundaries. First, one of the experts argued for «critical AI studies», and the statements from other interviews implicitly support this point. Critical AI studies are in contraposition to ethics: instead of reasoning about how things should happen, we need to look carefully into what is actually happening here and now, which is a job for social scientists/sociologists. Second, instead of sociology, the field of STS often stands out as a point of reference in a discussion of who does research on new technologies. However, relations of STS and sociology are ambiguous: in some interviews, they are discussed as intertwined, while in others they are considered as separate fields. These two issues, critical AI studies and STS *versus* sociology, in our opinion, deserve special attention in further research.

Among the different kinds of divisions that emerged during the interviews, geographical borders are also worth considering. As has been already mentioned, the experts hold positions in the scholarly organizations of nine countries. Several respondents referred to national and regional borders in the discussion of their research. One type of reference characterized specific features of the research topics and the organizations in a specific place: «*that's our job, we are working on that [studying public service innovation in Norway]*» (Int. 3). This type of reference was made in relation to India, Finland, Norway, Canada, and the European Union. Another type of reference related specifically to Russia and Italy implies provincialism, the indication of the narrowness or the lack of a certain type of research: «*…now it is a quite active, very lively research segment, where, unfortunately, there are very few sociologists, and in Russia, perhaps, there is none of them*» (Int. 8). Thus, spatial boundaries in social science exist at least in two forms: as regionalism and as provincialism.

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[11] Perhaps, it is one of the reasons why sociological perspective is becoming more and more associated with left-oriented ideological issues: critique of inequality, marketization, etc. In our interviews rhetoric on inequality and loss of privacy, which we discussed above, appeared in the narratives of the participants about their research, though we did not ask them the evaluative questions directly.

The last question we would like to examine here concerns the relations of our experts with computer science and engineering. The basic divide that became apparent from the interviews was the opposition between social sciences and humanities, on the one hand, and the technical sciences, on the other. This divide emerges in composition of research groups when experts work in teams, in the conferences they attend, and in the types of research problems they are working on. However, this divide takes different forms — from distant amicability to respectful ignorance to institutional animosity. There are polar opposite views of whether productive dialogue between social and technical sciences is possible:

> Yes, it takes effort and it takes time. But if both sides are prepared to listen to each other then it's also possible to have much more synergy, and much more serendipity, and much more new ideas. So, it's not easy but it can be very fruitful (Int. 7).
>
> Humanitarians or social scientists, as a rule, have very few competences to understand what is going on in the sphere of artificial intelligence and machine learning… On the other hand, the big problem is that engineers, computer scientists, they have ambitions to talk about society and economy, they even have ambitions to offer solutions to various social problems, but they completely lack culture, neither humanitarian nor in social sciences… And how to manage this mismatch, this discrepancy, how to build the bridge — it is absolutely unclear. Our science is settled up in such a way that it is impossible to overcome this gap (Int. 8).

Judgements on this issue are highly dependent on the actual experience of interaction with technical experts. People who have to work with computer scientists and engineers on their research projects have more optimistic views of the dialogue and collaboration with them. The same situation characterizes opinions on the technical knowledge issues that are often regarded as the main obstacle for mutual understanding and cooperation. Some of our interviewees consider it too hard, some are just not interested, while others consider it worth knowing: «…*it's amazing how a few people want to explore AI… the technology which is not all that difficult because we're modeling human brain, and a lot of things we're talking about in terms of machine learning, these are relatively simple concepts*» (Int. 5). Therefore, the main obstacle to the dialogue is probably organizational — the lack of opportunities for joint work between social and technical scientists.

In conclusion, the diverse disciplinary backgrounds and research interests of the scholars we interviewed, and the variety of academic institutions in different countries they represented make it appear that they share nothing in common. However, their gathering at the XIX ISA Congress is not a coincidence but rather an indication of uneven and complex development of the study of 'artificial sociality' in contemporary social science.

## Discussion and conclusions

The focus of our research is interdisciplinary boundaries in the studying of 'artificial sociality'. The empirical findings demonstrate that these boundaries exist in various forms and typically compose of disjoined fields and domains that are rarely overlapping. Scholars' attitudes to them also vary: from intra-disciplinary criticism to interdisciplinary rebukes, from the appreciation of other scholars' work to indifference to it, from the agreement on the division of labor to passing over established divides.

Returning to the hypotheses, we can conclude that the first one is mostly rejected, while the second one is mostly confirmed.

The first hypothesis is largely unsupported. Though disciplinary boundaries play an important role in a considerable part of the study of 'artificial sociality', disciplinary research is not the only and probably not the most popular domain. Much work is being done in interdisciplinary, anti-disciplinary, and policy studies. Differing in types of research questions, all these domains adopt and digest common concepts, methods, and findings from various disciplines. Thus, 'artificial sociality' is studied primarily between or outside well-established boundaries of sociology, anthropology, economics, history, etc.

The second hypothesis is mostly confirmed. Despite relative insignificance of disciplinary divisions, there is still no professional connection among social science scholars who study AI. New research domains do not constitute a unified field; rather, they develop their own divisions, but also construct paths to bridge the gaps between them. The variety of research topics and organizational forms demonstrates this incoherence. However, several shared orientations in the field provide common ground for further dialogue. These include the focus on social change, arguing against technological determinism, and special attention to transformations of labor.

The most important conclusion of our investigation is probably that in the social sciences, the research on AI-based technologies is flourishing mainly outside established disciplinary boundaries. We came to this conclusion even though the data was collected under the organizational framework of the ISA Congress, in other words, under an established professional body within sociology. The conclusion needs further verification in studies of wider scope. However, its plausibility could be supported by two theoretical arguments, one is more general while another concerns academic life in particular.

Primarily, our findings could be regarded as an instance of interstitial emergence of new forms of power as characterized by Michael Mann [Mann, 1986][12]. In the case of AI research, institutionalized forms of power presented by disciplinary divisions have not provided adequate organizational means to achieve research, as well as engineering goals. This led to the emergence of new organizational structures: research fields, academic journals, university departments, funding organizations, etc. This picture seems to be valid for the special case of AI research — studying 'artificial sociality': the widespread use of new technologies in the everyday life of humans also demands new organizational forms for conceptualization (ideological power) and the material basis of research (economic power).

Moreover, our results could be interpreted in terms of Randal Collins' conceptual framework of intellectual change [Collins, 1998]. This framework implies a two-level structure of the organization of scholarly attention. At the level of intellectuals' interactions, the discussion is driven by the inner dynamic of the scholarly coalitions and arguments. At the level of material and organizational structures, any change influences academic discussions indirectly by promoting coalitions and investigative tasks that have not existed yet or were marginal. In the case of AI research, new goals

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[12] We would like to thank Dmitrii Zhikharevich who brought our attention to this argument.

set by the governmental and business structures caused a re-structure of disciplinary fields and pushed new coalitions of scholars that resulted, in turn, in the emergence of new academic fields.

Reflecting on these results we would like to discuss possible developments and obstacles in studying 'artificial sociality'. Primarily, is this situation promising or disadvantageous for inquiry into the new phenomena of 'artificial sociality'?

On the one hand, the situation is not so optimistic for the social sciences. Nowadays social science disciplines accumulate data and describe new phenomena, nevertheless, in our view, they are not yet able to fully grasp them at the conceptual level. How is AI designed to solve instrumental problems, communicate with another AI, and / or interact with a person? How is the process of interaction organized? How do people perceive AI? What are human emotions, and what are their analogues in the case of AI? How can engagement and synchronization with a communication partner be achieved for the machines? What are the similarities and the differences in the language performance for human perception and AI? Does the way of framing and solving problems by the human mind change because of 'artificial sociality'? What about the usage of language and non-verbal images? What emotions does a person experience, and how do they change in the process of 'learning' how to interact with a machine? How does the perception of one's own body change? These questions are approached by sociology, social psychology, anthropology, etc. in diverse empirical studies, however, they are rarely reflected on at the theoretical level. In fact, much more conceptual work is being currently done by philosophers, cultural theorists, psychologists, and even computer scientists, than by social scientists.

On the other hand, the situation for studying 'artificial sociality' is promising. Reconfiguration of well-established borders and the search for new research problems in combination with change of organizational basis are the conditions in which we expect to observe high creativity [Collins, 1998]. In fact, we could observe it in STS, Internet studies, digital humanities, and so on. Knowledge that is produced outside the established boundaries could be characterized as falling within a continuum between two ideal types: inter-disciplinary and anti-disciplinary research. Interdisciplinarity is basically directed toward problems of 'translation' and interaction between different disciplinary perspectives in relation to the study of both the well-known and new phenomena. Anti-disciplinarity is driven by the fascinating novelty of new phenomena that are to be explored or created. The thesis that we want to advance here is that 'artificial sociality' as a field of study needs to develop a novel perspective of an anti-disciplinary subject that cuts across disciplinary boundaries. It is the field that inherently has to build bridges among engineering, natural sciences, social sciences, and humanities.

However, several circumstances could become barriers to scholarly creativity. We would like to finish this paper discussing the most important of them.

First, much more collaboration is needed between computer science and social sciences. Our research demonstrated the existence of a considerable division between them, both organizationally and in discourse. We also discovered that a positive experience of collaboration between the two resolves challenges connected with finding a common language, which might seem unsolvable to the uninvolved observer. However,

the opportunities for joint research projects and even for sharing findings are rare because of how scholarly organization operates today.

Second, the divisions in interdisciplinary and policy research seem to solidify, and they could prove to be no less strict than disciplinary boundaries. Divisions as such are fruitful when they manifest themselves into a dialogue, debates, and controversies but they lead to stagnation when they imply mutual ignorance and deafness [Collins, 1998]. It also seems that AI research is losing its anti-disciplinary orientation on inquiring into radically new phenomena and is fragmented throughout separate research fields. This leaves this orientation to such groups as transhumanism, which are marginal from the standpoint of existing scholarship. The above situation is paradoxical because 'artificial sociality' — participation of new AI-based agents in human interactions — embraces the novel phenomena that, we believe, call for original research questions and conceptual framework.

Third, what appears to be lacking in research on 'artificial sociality' is the study of sociality itself. The dominant topics in the field, at least for those who have organizational connections with sociology, are related to labor transformations that are usually analyzed at the structural level. This perspective ignores both the leisure and the communication with gadgets that permeate our everyday life and interaction. We believe that the examination of social interaction is the first priority because it is a crucial phenomenon that characterizes social existence and has implications for interactions between human beings and machines. How exactly are the forms of interaction and relations among people changing? Are people (individuals, groups, or societies) getting more or less social? Are there qualitative and quantitative changes in human emotions, attachments, relationships? What is the impact of the broader context, such as state, culture, language, type of social structure, on the way 'artificial sociality' changes people's everyday lives? How do technological changes interact with the social transformations of the modern societies, for instance, individualization, urbanization, changes in the family and friendships, etc.? We consider these questions no less important than new divisions of labor.

Finally, there is a deficit in theoretical frameworks. Both the review of the scholarly publications and the participant observation at the XIX ISA Congress demonstrate that the most influential theoretical resources which reflect on the interactions of non-humans in the social sciences are communication theories (both classical cybernetics and system theory of Niklas Luhmann) and actor-network theory. These approaches, in spite of vast differences between them, share one limitation: they are not able to identify specific characteristics of human interaction. In general, communication theories analyze all types of interactions as information exchanges, while actor-network theory argues for neglecting 'human exceptionalism'. Thus, these theoretical approaches have difficulties in elaborating conceptual distinctions between human interactions, human to machine interactions, and interactions between the machines, which are all conceptualized either as exchange of signals or as heterogeneous networks.

The most promising alternative is therefore 'sociology of human interactions' [Rezaev, Tregubova, 2017] based on theoretical findings developed by Erving Goffman, Harold Garfinkel, Randall Collins, Jurgen Habermas, Anne Rawls, Jeffrey Alexander, and other social theorists. This conceptual framework is characterized by the inten-

tionally anthropocentric position in current theoretical debates. As social scientists need to inquire into the specific features of human interaction (emotionality, sociality, spontaneity, etc.) to study 'artificial sociality', anthropocentrism can be considered an advantage. Thus, sociology of human interactions provides theoretical foundation for considering the differences of human to human, human to machine and machine to machine interactions and, as a consequence, inquiring into the problem of distinction between human consciousness and artificial intelligence.

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