THEORETICAL FRAMEWORK ON APPLYING ARTIFICIAL INTELLIGENCE IN SOCIOLOGY AND ITS INTERDISCIPLINARY IMPLICATIONS

Ramona Birău, Ph.D, Ph.Dc
University of Craiova, Faculty of Social Sciences
Craiova, Romania
Ramona.F.Birau@gmail.com

Gabriel Birău, M.Ed.
National College "Tudor Arghezi", Tg-Cărbuneşti, Romania
gabirau@yahoo.com

Abstract

The main purpose of this research article is to investigate the wide interdisciplinary implications of artificial intelligence in sociology. Sociology requires knowledge in the understanding of human societies, including social structure and human behaviours. Artificial intelligence reflects an increasing challenge in the case of sociological research taking into account the accuracy and innovation provided by computerised technology and intelligence techniques. Globalization emphasizes the need to obtain optimal results and high accuracy in sociological research, additional to the traditional approach.

Key-Words: artificial intelligence, sociology, computer systems, globalization, intelligence techniques

I.   INTRODUCTION

Sociology is a science that studies social phenomena as well as the dynamics of human behaviour within society. In spite of the fact that there is no generally accepted definition of the concept of sociology, this science seems diametrically opposed to the rigors imposed by computer systems and, implicitly, artificial intelligence. Sociology is an essential component of human sciences considering the broad implications in the study of social behaviours. Sociology is a relatively young science in the context of interdisciplinary approaches covering a very extensive research area with multiple implications. Sociology of scientific knowledge is also widely controversial as theoretical approach and it comprises social actions and interactions. An overview of the sociological perspectives of human behaviour is more accurate based on machine learning tools related to artificial intelligence. Artificial Intelligence applications in sociology may seem a semantic paradox, but this seemingly controversial approach achieves impressive performances.

II.   LITERATURE REVIEW

The main purpose of the literature is to provide a theoretical framework on applying artificial intelligence in sociology and its complex interdisciplinary implications. Woolgar (1985) investigated the possibility of association between sociology and artificial intelligence based on the alternative perception that artificial intelligence represents "an occasion for reassessing the central axiom of sociology". Schwartz (1989) has provided an early and innovative insight about artificial intelligence as a sociological phenomenon and suggested that the accuracy of such a modern approach depends on "conditions for knowledge in contemporary society". Churcher (1991) has analyzed essential issues regarding the impact of artificial intelligence on leisure based on a micro-sociological view and a macro-sociological view along with the many implications of this very exciting perspective. Carley (1996) investigated relevant aspects regarding artificial intelligence within sociology due to the increasing use as an effective alternative of artificial intelligence techniques on the incomparably more traditional and conservative field of sociology. Recently, in a challenging research article, Ezrachi and Stucke (2015) discussed about the implications of artificial intelligence, self-learning and independent computers, computerised technology, as well as the complex impact of the relationship between man and machine. Moreover, Birău (2014) has identified specific applied methods of artificial neural networks, which is a particular and representative form of artificial intelligence, such as: algorithm optimisation, systems engineering, data classification, clustering, data processing, data mining, adaptive control, filtering, pattern and sequence recognition. Bodanza (2015) has developed a study on abstract argumentation in artificial intelligence regarding decision making and its implications. Dhar (2016) provided an interesting theoretical approach on the future of artificial intelligence by trying to identify pertinent answers to essential questions of profound rhetoric.

III.   CONCEPTUAL DISSEMINATION

Artificial Intelligence (AI) is a complex concept of simulating human intelligence based on computer science and intelligent machines but without the intervention of a human operator. Nevertheless sociology aims to expand the general and traditionally known perception through a wide and   comprehensive interdisciplinary approach. Artificial intelligence can be applied in a wide range of areas such as sociology, finance, management, industry, public administration, engineering, medicine, linguistics, education, psychology, robotics, astronomy, law, physics, forensics, economics, marketing and others. Basically, artificial intelligence is increasingly used to improve the accuracy of the results obtained by traditional methods. In other words, artificial intelligence represents a modern and innovative alternative that leads to impressive solutions in diverse areas of research. Artificial intelligence provides a competitive advantage based on advanced information processing being a viable solution where most traditional methods fail, including the case of sociology and its wide implications. Technically, the methods used in sociological investigations require interdisciplinary knowledge. Artificial intelligence is one of the most significant and disruptive challenge of the recent past but whose potential for growth is considerable and still not exploited sufficiently. In spite of the fact that sociology is part of the social sciences category, the very orientation towards the study of social actions and behaviours requires effective research tools. The definition of sociology is still fluid, has not reached a rigid theoretical potential and every new conceptual approaches enrich the dynamics of this social

science. Sociology is first and foremost a science about society as a whole, difficult to cognizable and composed of a broad conglomerate of endless individual behaviours. Sociology is broadly defined as the study of society but it involves significant consequences that reach far more extensive meanings. Sociology is one of the most popular current research fields with an impressive growth potential. Social science covers a basic approach of individual social behaviours but extrapolating the phenomenon identifies an aggregate pattern of general relevance. In addition, intelligent machines and computer systems identifies behavioural patterns of overall societies or social groups in order to predict future trends based on results of high accuracy. Moreover, sociology encompasses fundamental social processes considering humanities-based approaches.

IV.   CONCLUSIONS

Applying artificial intelligence in sociology highlights an increasing challenge in research, especially in the context of globalization. Sociology investigates patterns of social behaviours considering social groups, social phenomena, social actions, social institutions and other social entities. Research conducted on the basis of modern artificial intelligence techniques provides very interesting and accurate results where traditional techniques do not have methodological coverage. Sociology cannot be reduced to its component parts and the aggregate study requires a pragmatic approach and increased accuracy.

REFERENCES

[1] Birău, F.R., (2014) Forecasting financial time series based on Artificial Neural Networks, IMPACT: International Journal of Research in Business Management (IMPACT: IJRBM), ISSN(E): 2321-886X; ISSN(P): 2347-4572, Vol. 2, Issue 4, Apr 2014, pp. 63-66;

[2] Bodanza, G.A (2015) "Abstract Argumentation in Artificial Intelligence. Problems of Interpretation and Adequacy of Semantics for Decision Making", THEORIA. An International Journal for Theory, History and Foundations of Science,Volume 30, issue 3, pp. 395-414, Euskal Herriko Unibertsitatea Publisher, ISSN 2171-679X

[3] Carley, K.M. (1996) "Artificial Intelligence within Sociology", Sociological Methods & Research, SAGE Journals, Volume 25, Issue 1, pp. 3 – 30, Online ISSN: 1552-8294, DOI: https://doi.org/10.1177/0049124196025001001 ISSN: 0049-1241;

[4] Churcher, P.R. (1991) "The impact of artificial intelligence on leisure", Springer-Verlag London Limited 1991, Volume 5, Issue 2, pp. 147–155, Print ISSN 0951-5666, DOI : https://doi.org/ 10.1007/BF01891720, Online ISSN 1435-5655;

[5] Dhar, V., (2016) "The Future of Artificial Intelligence" Big Data, Volume 4, Issue 1, pp. 5-9, ISSN: 2167-6461, Online ISSN: 2167-647X, Mary Ann Liebert, Inc. publishers, https://doi.org/10.1089/big.2016.29004.vda;

[6] Ezrachi, A., Stucke, M.E., (2015) "Artificial Intelligence & Collusion: When Computers Inhibit Competition, Oxford Legal Studies Research Paper No. 18/2015, University of Tennessee Legal Studies Research Paper No. 267, http://dx.doi.org/10.2139/ssrn.2591874, 39 pp.;

[7] Schwartz, R.D. (1989) "Artificial Intelligence as a Sociological Phenomenon", The Canadian Journal of Sociology, Volume 14, issue 2, pp. 179-202, DOI: 10.2307/3341290;

[8] Woolgar, S. (1985) "Why not a Sociology of Machines? The Case of Sociology and Artificial Intelligence", Sociology, SAGE Journals, ISSN: 0038-0385, Online ISSN: 1469-8684, Volume 19, issue 4, pp. 557-572;