

Social and Ethical Impact of Artificial Intelligence on Public - A Case Study of University Students

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ABSTRACT

Artificial intelligence (AI) - a subfield of computer science, is the intelligence that is being exhibited with the help of machines or software. The study of artificial intelligence is becoming a popular field, since it has proved to be valuable for human life in many areas and has given rise to another technology known as “expert system”. The application areas of Artificial Intelligence have a huge impact in our daily lives. They are widely used to solve the complex problems in various areas as science, business, health-sector, banking, weather forecasting etc and the areas using AI have seen a tremendous increase in quality and efficiency. The paper explores the current use of AI in various sectors and indicates whether the people using it are satisfied with its growing use and its development by the experts. The research showed that AI is commonly and successfully used in different service industries. Role of AI in different industries have been studied and surveyed: health-care, e-government, banking, transport, etc. The paper focuses on the ethical decision of whether to support or oppose the development of AI/ Robotic Community. The major goal of this project is to analyse the extent to which public and expert opinion mirrors the reality of the Artificial Intelligence field. It is believed that in the future, intelligent machines will replace or enhance human capabilities in many areas. The paper presents the findings of a survey of the applications of AI techniques among university students; determine the current and growing use of AI techniques; characterize the benefits and constraints of using such techniques.

Keywords: AI, expert system, Robotics

I. INTRODUCTION

The subject matter of AI has brought many anticipation in society. Not only does AI has been promises such as efficiently solving “numerous technical problems but also AI would promise for a better understanding in “cognitive processes, particularly, the human mind[1]”. The term Artificial Intelligence was by coined John McCarthy at the Dartmouth Conference in 1956. This conference was attended by such AI giants as Marvin Minsky, John McCarthy, and C. E. Shannon. It was this conference that concluded that human tasks can be defined in such a rigorous way that computers can simulate it. These researchers went on to become some of the leading figures in Artificial Intelligence [2]. It is claimed that artificial intelligence is playing an increasing role in the research of management science and operational research areas. Intelligence is commonly

considered as the ability to collect knowledge and reason about knowledge to solve complex problems. In the near Future intelligent machines will replace human capabilities in many areas. Artificial intelligence is the study and developments of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive the objects. John McCarthy coined the term in 1956 as branch of computer science concerned with making computers behave like humans. It is the study of the computation that makes it possible to perceive reason and act. Artificial intelligence is different from psychology because it emphasis on computation and is different from computer science because of its emphasis on perception, reasoning and action. It makes machines smarter and more useful. It works with the help of artificial neurons (artificial neural network) and scientific theorems (if then statements and logics). AI technologies have matured to the point in

offering real practical benefits in many of their applications. Major Artificial Intelligence areas are Expert Systems, Natural Language Processing, Speech Understanding, Robotics and Sensory Systems, Computer Vision and Scene Recognition, Intelligent Computer- Aided Instruction, Neural Computing. From these Expert System is a rapidly growing technology which is having a huge impact on various fields of life. The various techniques applied in artificial intelligence are Neural Network, Fuzzy Logic, Evolutionary Computing, and Hybrid Artificial Intelligence.

ROOTS OF AI: The roots of AI can be traced back to ancient Greece with myths like that of Pygmalion which incorporated the idea of an intelligent robot. These early thoughts soon developed into stories like Mary Shelley's Frankenstein in 1818, which was the story of a monster created by man and brought to life. However, most scientists and historians would give this credit to the "father of artificial intelligence – John McCarthy". Without John McCarthy, the term "artificial intelligence" would not have been coined, and many discoveries in this growing field would not have been made.

ETHICS IN AI: The different actions that can be carried out include.

The first and foremost possible action is to allow further research in the field of AI without any restrictions. The second option is to completely put ban any further studies on AI and the third option is to put restrictions in this field of study. Choosing one of the two extreme possible actions would not be practical in society. The first one would be too dangerous if we go too far, and the second one violates people's rights. Therefore, the best decision that would benefit society is to compromise both of these. Something in between the two that are not too extreme. Scientists, researchers, inventors should be allowed to continue on this field with some restrictions in order to allow them to expand on their knowledge. At same time society would remain more virtuous than if they had no restrictions.

II. LITERATURE REVIEW

In recent there has been influx of software that incorporates elements of artificial intelligence. There has been a great advancement in last few years and countless improvements has been made in sub field of AI. Alan Turing tried to answer that is it possible for

machines to think in the computing Machinery and intelligence. He developed the imitation game between two subjects. A written communication is carried between two subjects in order to differentiate between human and machine and they are not allowed to hear, see or otherwise sense. This game is regarded as Turing test [3]. The image interpretation has gained momentum, the field of AI has not fully automated radiology but still first and second level checking brings improvement in speed and cost effectiveness of medical imaging. Various machine learning techniques can be applied to medical image data. Papers in literature shows that deep neural networks are trained that produce basic radiological findings, results produced are highly reliable by imparting training from this data [4]. In k-12 schools most versatile kits are available to create robots having new sensing technologies which are programmed in wide variety of languages. Ozobot robot is one developed to teach children to code and reason deductively while configuring to dance [5]. Logical thinking in children is developed using Cubelets which involves assembling robot blocks to think, sense or perform action which depends on the function of different blocks [6]. Intelligent tutoring system (ITS) and online learning systems were developed from research laboratory projects includes why-2 Atlas, it aims to supports human-machine dialogue to for solving physics related problems [7]. Foreign language training is provided by the software's that use automatic speech recognition and NLP techniques. These help the users to locate errors and correct them [8]. Carnegie Cognitive Tutor a tutoring system to learn mathematics has been used in U.S high schools. Other ITS has been used in the fields to get training in geography, computer literacy, chemistry, genetics and others[9] In the field of higher education an ITS called as SHERLOCK is used by Air Force technicians which locates electrical system problems in aircraft[10]. New algorithm's which includes Bayesian Knowledge Tracing for personalized tutoring enable individualized mastery learning and problem sequencing [11]. NLP assessment tools have been developed to co-grade by standardized testing the essays since 1990s for educational testing service [12]. Automated generation of questions to test continually the students is made possible by designing to assess vocabulary [13], questions [14], and MCQs [15] by using electronic resources. For online learning systems at massive scale data sets are being collected which has accelerated the growth in the field of learning analytics. Organizations like society for learning analytics

research and the increase of conferences including the learning analytics and knowledge conferences [16], learning scale conference [17] reflect this trend. The experiences of certain institutions, such as San Jose State University's experiment with Udacity[18] have led to more sober assessment of the potential of the new educational technologies. steps in direction are being taken by increasing collaborations between AI researchers and researchers in the humanities and social sciences, exemplified by Stanford's Galileo Correspondence Project[19] and Columbia's Making and Knowing Project[20] These interdisciplinary efforts create interactive experiences with historical documents and the use of Virtual Reality (VR) to explore interactive archaeological sites[21].

III. OBJECTIVES

1. This paper presents the findings of a survey of the application of AI techniques amongst university students.
2. Determine the current and growing use of AI techniques, and in which areas they are applied and characterized the benefits and constraints of using AI in various areas.
3. Investigate the satisfaction of people in context of different fields of AI.

IV. RESULTS AND DISCUSSION

The data for the paper was collected through primary and secondary sources. The data collection method involved questionnaires and semi-structured open-ended interviews. The aim of questionnaire was to gauge the perspective of people towards the progress in the original goals of smart machines and what impact they associate with reaching the goals of AI. The primary objective of the research study was to investigate the satisfaction of people in the context of different fields of AI. The research also focuses/ highlights the criticisms of AI. The pie-chart in fig 1 shows that only 10% of respondents believe that human thinking can be replicated in machines while 20% respondents believe that is completely not possible to replicate human thinking in humans. In addition, around 35% respondents answered that it is may be possible and the same percentage of respondents also said that they have no idea whether it can be implemented or not. Mankind's ability to construct new ideas follows a logarithmic path and is rapidly approaching an asymptote or technological

singularity. When the technological singularity is reduced, it is hypothesized that man's greatest creation, an artificial sapient being, will supersede human brain capacity. According to some, this event will lead to the extermination of mankind as humans are deemed obsolete. Yet others are projecting a merngence between Artificial Intelligence and Humanity.

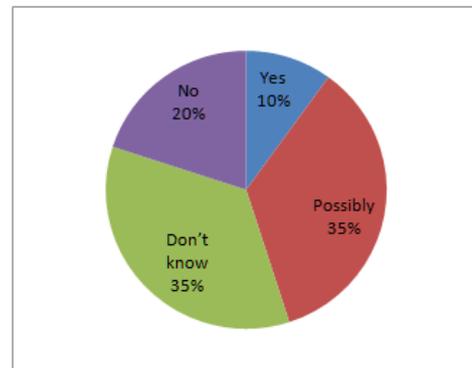


Figure 1: Is it possible for human thinking to be replicated in machines?

The pie-chart (Fig 2) shows that 60% of people agree that systems that use intelligence for e-service provide better service compared to existing systems e.g. in web mining and help in identifying potential customers and their requirements, while only 5% of people strongly disagree with the statement. EQ or EI (Emotional Intelligence) is the ability to perceive, control and evaluate emotions. It also helps a person communicate effectively, empathize with others, overcome obstacles, and resolve conflicts. It is believed that computers with emotional intelligence are not only possible but are also achievable in a 20-year time frame. The service provider uses intelligence in the system to ensure that communication and delivery of services is according to their expectations.

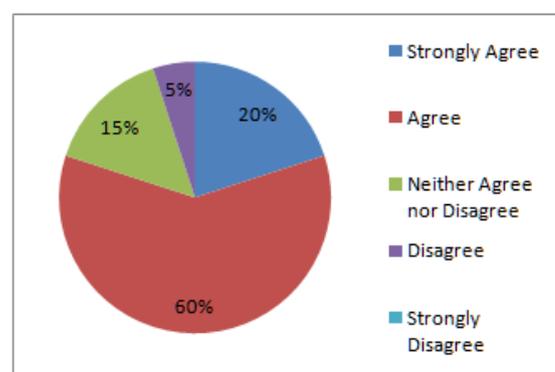


Figure 2: Systems That Use Intelligence For E-Service Provide Better Service Compared To Existing Systems.

The histogram (Fig 3) shows that 25% of respondent's strongly agree and 40% respondents agree that banking sectors using artificial neural networks increase customer satisfaction by providing high quality services. In addition, 25% respondents neither agree with it nor disagree with it. In banking industry, Ai is used to organize bank operations and to participate in trading. The use of AI in banks allows them to reach their customer needs. Findings prove that customers have switched to banks that apply modern day technology for their banking needs. Workloads that are accumulated when services are offered manually are eliminated and this saves on costs.

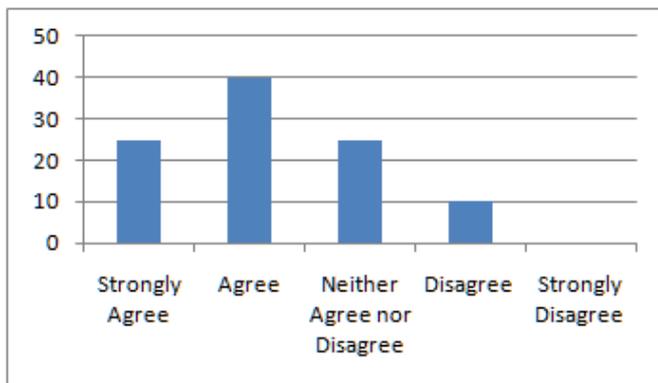


Figure 3 : Banking Sectors Using Artificial Neural Networks Increase Customer Satisfaction.

The histogram (Fig 4) shows that 30% of respondent's strongly agree and 50% respondents agree that using Artificial Intelligence in games can be used as a simulating tool and the user also believes that using AI in computer games increases the scope and usage of AI. Only, 5% respondents strongly - disagree with it and also only 5% disagree with it. AI is used in computer games to create non-player characters such as human beings and animals: this helps in eliminating the boredom that exists in virtual worlds that do not have non-player characters (Heinimaki & Vanhatupa 2013, 2) [Heinimaki, Teemu J. & Juha-Matti Vanhatupa 2013. Implementing Artificial Intelligence: A Generic Approach with Software Support. Proceedings of the Estonian Academy of Sciences 62.2.27-38].

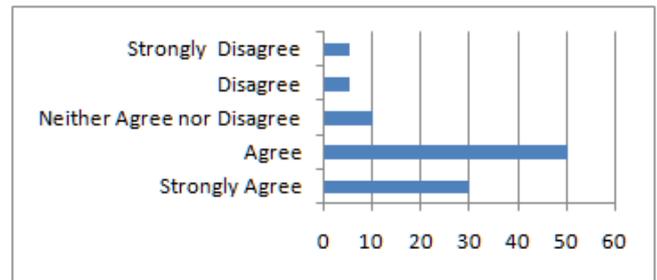


Figure 4: Computer Games Increases The Scope And Usage Of AI.

V. CONCLUSION

What is actually stopping the current researchers from more directly pursuing the ultimate dream is the unfortunate failure of “Artificial Intelligence”. Undoubtedly, it is cowardice AI provides the next great frontier. With careful modelling after the old one, learning from their new environments, with the current intelligences we will be able to gain some kind of perception. Who else but us, now, should be the creators of the next world? After all, we have done such a good job with this on. Pioneers in this field have much to lose – perhaps all brain functions, perhaps more but they have much more to gain : the creation of an eternalized human race, unfettered by the degradation of bodies and the imperfection of RL. The technological advancements are incredible; one should take advantage of this and not take it for granted. And the best decisions that would reflect this is to allow scientists, researchers and creations of AI to continue with what they have been doing. However there needs to be some restrictions with a clear boundary line that would benefit everybody in society, the best decisions are the rational decisions that are best for everybody.

In short, robots and artificial intelligence should complement humans and not supplant them. I believe that the future will be a positive one if humans and robots can help and complement each other. The role played by experts of AI is not evil but instead they have been working for years to develop systems that could help the elderly, improve health care, make job safer and more efficient and allow us to explore space or beneath the oceans.

VI. REFERENCES

- [1]. Otto Neumaier, *Artificial Intelligence – The Case Against* ed. Rainer Born, (London :Routledge,1989),132.
- [2]. McCorduck, Pamela. *Machines who think*. San Francisco: W. H. Freeman and Company, 1979. 33-34.
- [3]. A. M. Turing, "Computing Machinery and Intelligence," *Mind*, 1st ed., 1950, pp. 433 – 460.
- [4]. *IEEE Transactions on Medical Imaging* 35, no. 5 (2016): 1285–1298.
- [5]. Ozobot, accessed August 1, 2016, <http://ozobot.com/>
- [6]. "Cubelets," *Modular Robotics*, accessed August 1, 2016, <http://www.modrobotics.com/cubelets>.
- [7]. Kurt VanLehn, Pamela W. Jordan, Carolyn P. Rosé, Dumisizwe Bhembe, Michael Böttner, Andy Gaydos, Maxim Makatchev, Umarani Pappuswamy, Michael Ringenberg, Antonio Roque, Stephanie Siler, and Ramesh Srivastava, "The Architecture of Why2-Atlas: A Coach for Qualitative Physics Essay Writing," *Intelligent Tutoring Systems: Proceedings of the 6th International Conference*, (Springer Berlin Heidelberg, 2002), 158–167.
- [8]. VanLehn et al, "The Architecture of Why2-Atlas."
- [9]. "Resources and Support," *Carnegie Learning*, accessed August 1, 2016, <https://www.carnegielearning.com/resources-support/>.
- [10]. Alan Lesgold, Suzanne Lajoie, Marilyn Bunzo, and Gary Eggan, "SHERLOCK: A Coached Practice Environment for an Electronics Troubleshooting Job," in J. H. Larkin and R. W. Chabay, eds., *Computer-Assisted Instruction and Intelligent Tutoring Systems: Shared Goals and Complementary Approaches* (Hillsdale, New Jersey: Lawrence Erlbaum Associates, 1988).
- [11]. Michael V. Yudelson, Kenneth R. Koedinger, and Geoffrey J. Gordon, (2013). " Individualized Bayesian Knowledge Tracing Models," *Artificial Intelligence in Education*, (Springer Berlin Heidelberg, 2013), 171–180.
- [12]. Jill Burstein, Karen Kukich, Susanne Wolff, Chi Lu, Martin Chodorow, Lisa Braden-Harder, and Mary Dee Harris, "Automated Scoring Using a Hybrid Feature Identification Technique" in *Proceedings of the Annual Meeting of the Association of Computational Linguistics*, Montreal, Canada, August 1998, accessed August 1, 2016, https://www.ets.org/Media/Research/pdf/erater_acl98.pdf.85EdX, <https://www.edx.org/>, Coursera, <https://www.coursera.org/>, Udacity, <https://www>.
- [13]. Jonathan C. Brown, Gwen A. Frishkoff , and Maxine Eskenazi, "Automatic Question Generation for Vocabulary Assessment," *Proceedings of Human Language Technology Conference and Conference on Empirical Methods in Natural Language Processing (HLT/EMNLP)*, Vancouver, October 2005, (Association for Computational Linguistics, 2005), 819–826.
- [14]. Michael Heilman, "Automatic Factual Question Generation from Text," PhD thesis CMULTI-11-004, (Carnegie Mellon University, 2011), accessed August 1, 2016, <http://www.cs.cmu.edu/~ark/mheilman/questions/papers/heilman-question-generation-dissertation.pdf>.
- [15]. Tahani Alsubait, Bijan Parsia, and Uli Sattler, "Generating Multiple Choice Questions from Ontologies: How Far Can We Go?," in eds. P. Lambrix, E. Hyvönen. E. Blomqvist, V. Presutti, G. Qi, U. Sattler, Y. Ding, and C. Ghidini, *Knowledge Engineering and Knowledge Management: EKAW 2014 Satellite Events, VISUAL, EKM1, and ARCOE-Logic Linköping, Sweden, November 24–28, 2014 Revised Selected Papers*, (Switzerland: Springer International Publishing, 2015), 66–79.
- [16]. The 6th International Learning Analytics & Knowledge Conference, accessed August 1, 2016, <http://lak16.solaresearch.org/>.
- [17]. Third Annual ACM Conference on Learning at Scale, <http://learningatscale.acm.org/las2016/>.
- [18]. Ry Rivard, "Udacity Project on 'Pause'," *Inside Higher Ed*, July 18, 2013, accessed August 1, 2016, <https://www.insidehighered.com/news/2013/07/18/citing-disappointing-student-outcomessan-jose-state-pauses-work-udacity>.
- [19]. Stanford University: Galileo Correspondence Project, accessed August 1, 2016, <http://galileo.stanford.edu>.
- [20]. The Making and Knowing Project: Reconstructing the 16th Century Workshop of BNF MS.FR. 640 at Columbia University, accessed August 1, 2016, <http://www.makingandknowing.org>.
- [21]. Paul James, "3D Mapped HTC Vive Demo Brings Archaeology to Life," *Road to VR*, August 31, 2015, accessed August 1, 2016, <http://www.roadtovr.com/3d-mapped-htc-vive-demo-bringsarchaeology-to-life/>.3Hoo-Chang Shin, Holger R. Roth, Mingchen Gao, Le Lu, Ziyue Xu, Isabella Nogues, Jianhua Yao, Daniel Mollura, and Ronald M. Summers, "Deep Convolutional Neural Networks for Computer-aided Detection: CNN Architectures, Dataset Characteristics and Transfer Learning,"