Soft version of Approaching Artificial Intelligence and Humans What do they think?

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Abstract

The future is something intriguing. Since the dawn of humanity, we have tried to predict what will come next. Society has always been concerned with what it doesn't know and can't control. Artificial intelligence (AI) is regarded as the "technology that defines the future".

Some AI technologies have been around for over 50 years, but better development of processing power, availability of high amounts of data, and new algorithms have allowed great advances in AI in recent years.

The goal of this paper is to present and discuss the results of 29 interviews conducted with university students, who frequent informatic degree. The main questions of the interviews were concerning with student's opinions and definition about artificial intelligence and Humans. The results were, previously expected, since the interviewees are young people already connected with their ancestors' culture. They have the preconceived idea that artificial intelligent is a technology that will substitute people in their jobs. However, we got other information very interesting for the development and acceptation of this technology as a solution to improve people's quality of life.

Keywords

Artificial intelligence, humans, grounded theory methodology, students

1. Introduction

AI was a thing in science fiction for many decades before becoming part of our everyday lives. The concept of AI was introduced in Alan Turing's concept of "thinking machines" in the mid-1900s. AI's influence has already reached all parts of society where we have available data and/or improvement is needed either by automation or inventions [1]. The availability and development speedy of computer systems capable of processing a large amount of data faster and more accurately than humans can have contributed to the integration of AI in our lives. This means that, human activities in society have already been affected or can be affected by AI [1].

AI is the ability of a computational device, through a combination of various sciences, such as computing, mathematics, to replicate some cognitive skills and thus, process data, optimize processes, correct errors, be more accurate and solve problems. This context leads to changes both in technology, and in the way we relate to it.

Artificial intelligence is above all an intelligence that imitates human actions. The advantages for its ability to identify patterns, and, unlike humans, it does not present physical fatigue. This technology allows humans to do what we do, more efficiently. Thus, there is an excellent opportunity for interaction between men and machines.

This paper is organized around the following structure: a background which some authors definitions and AI application cases; then, a context about culture for AI/Humans is summarize; the study

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description follows, and the methods to collect and analyze data within Grounded Theory Methodology is presented. Finally, the results and discussion about the study, and a conclusion will terminate the paper.

2. Background

The concept of AI is enduring as long back as 1950s. In those days, people used to have kept high hopes towards success of AI in every sector of the society [2,3,4,5].

Artificial intelligence is considered as a new concept. It is associated with the idea that intelligence is supposed to be manifested by the computer systems, which was the sole property of humans previously. Without human help, the AI can take decision and can solve complex problems in different sectors of the society. It has brought in a vital societal change in the perspective of revelation of human intelligence [6].

Artificial intelligence is already present in the most remote and intimate areas of our personal life, as well as, in almost every software application we use. Humans manage the information that we visualize in applications (SPAM filtering algorithms) received orders via voice to turn a light on, and off (google Assistant, Alexa, Siri), etc). AI is in people's homes, listening to everything that happens around us. Even in video games, social networks or industries, human and non-human relationships are already intertwined. This interconnection between the virtual world and the real world, driven by AI technology, will continue to gain power and this will have an impact on our social behavior. We have also seen real partnerships between man and machine.

Governments of many countries are using AI technology to improve the efficiency of their employees working in all levels. Conversely, they are also taking help of AI to improve their financial allotment mechanisms and to help to optimize their budgets [7]. There are other instances through which society is being benefited by AI, which subject is out of the scope of this paper.

3. Culture: Humans/AI or AI/Humans

Cultural values that individuals and/or their societies uniquely possess can influence their learning processes in everyday practices. In turn, AI that imitates its users' decision-making patterns can also begin to reflect the users' cultural values [8].

Artificial Intelligence is a cultural reference more than it is a technological one. Artificial Intelligence as a cultural myth refers to the narrative of machines overtaking and leading the human world to a higher form of existence [9]. The term Artificial Intelligence signifies a subconscious collective meaning – a myth in the extended definition of Roland Barthes (*Mythologies* 1957).

In Barthes' feeling, a myth is more than an ancient story known to many. By in his definition, any semiotic process can gain a subconscious collective meaning. Artificial intelligence as a myth stands for a human narrative that is both deeply feared and deeply longed for.

The AI revolution is not so much about cyborgs and super-robots in the future, but rather massive changes in the here-and-now of everyday life. In *The Culture of AI*, Elliott explores how intelligent machines, advanced robotics, accelerating automation, big data and the Internet of Everything impact upon day-to-day life and contemporary societies. The Culture of AI explores technological innovations from industrial robots to softbots, and from self-driving cars to military drones – and along the way provides detailed treatments of [10]:

- The history of AI.
- Automated technology, jobs, and employment.
- The self and private life in times of accelerating machine intelligence.
- AI and new forms of social interaction.
- Automated vehicles and new competition.
- and the Future of AI.

In fact, robots will replace humans in many jobs and tasks. "*And here I'm being a bit of a generalist, but you can call it Artificial Intelligence or Machine Learning, or any software that was developed to learn from observations based on data. Increasingly, companies and factories deploy these technologies, powered by intelligent algorithms that "work" alongside people*" [11]. According to Lim [12], the main reason for not many humanlike robots is due to the Masahiro Mori theory. His theory states that affinity is presented on the Y-axis and human likeness is on the X-axis. In line with Mori, the less humanlike the robot, the fewer affinity people will have for the creation. Once you give a robot a more human face, the affinity towards the creation will increase.

"Advancing AI by collecting huge personal profiles is laziness, not efficiency. For artificial intelligence to be truly smart, it must respect human values, including privacy. If we get this wrong, the dangers are profound." [13].

The user culture diverge according to each people experiences and family education all over the years where they were listening to ancestors' opinions. In different societies, since the beginning, youngers hear talk about AI, as a bad think that will bring unemployment and substitution. In their minds AI should just be concentrated in fictional movies.

From people points of view, culture is different from values, habits, myths, family rules, forms, which define different ways of intersubjective exchanges that the world is feeling from specific values, which define different culture. However, the author considers that some of the students answered the interview's question based on the values and conversations they have at home with their families. If the family think that AI will kill their job, student will come with that idea.

We are talking about those students who are in the first year of their course degree, and they not had artificial intelligence courses. After those courses, they start feeling the first advantages of using AI algorithms. Contrarily, students in a master course, they are already more mature either personally or professionally. Their wanders were more technical, and they presented detailed descriptions of AI applications. So, culture in society have a great role on the first phase of a student knowledge acquisition.

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Thus, what brings out the difference between the intelligent processing of man and machine is precisely the socio-cultural context, in addition to the personal characteristics of each subject.

How the relationships between artificial intelligence systems and the humans who use them will be established as to do with usefulness. Becoming increasingly useful and essential in daily routines, individuals are linked to these systems and, in extreme cases of emotional fragility, can build deep relationships of affection and comfort. In a theoretical vision and in an experimental environment, ethics must be present, and several variables coordinated to guarantee the integrated and devoted development of this type of systems.

4. The Study

The study was conducted with 29 university students (age between 18 and 30 years old) in a university where they study an informatic engineering course. They are from 1st, 2nd, years of a licentiate degree and five students are from a master's degree in computer science. At this moment only the master students had already classes about Artificial Intelligence.

The research question to be answered was: What is the artificial intelligence impact on individuals and society? Humans/AI or AI/Humans?

Before answering the questionary, the subject was introduced for debate in a theoretical class. A brief history concerning the several AI definitions and goals along more than 50 years was introduced.

Form the debate, the teacher prepares open questions to be answered by students working in teams. Other complementary question arrived from the class discussion, for example: what kind of changes in the technological world could AI bring for human people?

The students were divided into groups of three students and a non-structured interview was conducted. One of each group of students were the interviewer inside the team, then the interviewer changed until each one had the opportunity to have the same role. After that, the recorded conversations were translated and send to the professor, by email. The time duration for each interview was settled for 20 minutes. The interviews were video recorded and then translated.

In the second situation, which means, with the master students a semi structured interview was prepared and each individual students answered to the given questions.

5. Methods and Methodology

We used Grounded Theory (GT) as a general method to use on any kind or combination of data, and it is particularly useful with qualitative data [14], [15] who argue that GT is only one of several different qualitative research methods available to those conducting exploratory research. The basic idea of the grounded theory approach is to read (and re-read) a textual database or observations of behavior, such as interactions and label variables (called categories, concepts, and properties) and their interrelationships.

The GT approach, particularly the way Strauss [16] develops it, consists of a set of steps whose careful execution is thought to "guarantee" a good theory as the outcome. It involves two phases in the analysis of qualitative data. Data fragments are compared to derive general descriptors (concepts; categories), which catch their analytically relevant properties. The second phase is used to elaborate, refine, and reduce results of the first phase.

For the data gathered both unstructured interviews, and semi structured ones were designed to obtain qualitative data. The former where used by first and second degree subtends and the later by master students. Interviews permitted, by asking questions that explore a wide range of concerns about the problem, to give interviewees the freedom to provide detailed responses. When the interviews were concluded a new phase arose, the data transcription and analysis. The analysis was made up following the same procedures, independently, of being unstructured or semi structured. From that moment, different codes were defined to give rise to several categories.

To generate GT, the researcher engaged in an iterative process of data collection and constant comparative analysis. Essentially, each line, sentence, paragraph etc. was read in search of the answer to the repeated question "What is this about? What is being referenced here?" our strategy was: the data from the recorded interviews was inserted in NVIVO software. Then, the textual data from interviews was coded and categorized following Charmaz [17]. The conceptual development was conducted, after transcribed, by using coding – open coding was used for the emergence of categories and properties. The categories were labeled with nouns and verbs. In a later stage, the researcher adopted another GT technique: the comparison among the participants' answers, to find relationships and differentiations in opinions. Then, the concepts were grouped to find categories.

6. Results and Discussion

The investigation about artificial intelligence and humans, started by the author's research concerning papers about the subject. The summary of each paper contents was projected by the professor at the beginning of a theoretical class. To remember: the themes were 'What is the artificial intelligence impact on individuals and society?' 'Humans/AI or AI/Humans?' A free and individual opinions from the students were discussed.

The main and general results conduced to Scott opinion: change, usage, learn. The fact is that it is not machines that bring about change but rather the people who use them. Among many aspects of

artificial intelligence systems implementation and usage, one of the key characteristics of AI is – the interaction between users and their AI, called *mutual learning*. That is, AI should learn from its users' decision-making behaviors, and users should better understand how AI can support and influence their decision-making as well as its limitations [18]. The AI developments have both positive and negative points.

Table 1 presents the main points that students answered about AI and Humans. The list is made up from the data analysis using grounded theory approach. Author considers that the data analysis was saturated when these concepts were founded. Other concepts were found but since some of them were synonymous, they were deleted from table 1.

Table 1 - Positive and Negative Aspects of Artificial Intelligence - an extract of the data gathered from the interviews

Concepts	Positive	Negative
A	Disease diagnosis	Defense Systems
B	Entertainment	Weapons
C	Solutions for Problems	Loss of Control
D	Increase Human Capabilities	Unemployment
E	Better performance	Financial market
F	Leadership	World Leaders Manipulation
G	Creativity	
H	Speed	
I	Scalability	
J	Innovation	
K	Better Human Beings	
L	Team Collaboration	

The following subsections state the positive and negative aspects that students referred in their interviews.

From interviews data analyze, figure 1 present a summary of the collected codes using grounded theory. Codes are an example of the keywords taken from the narrative in the interviews.

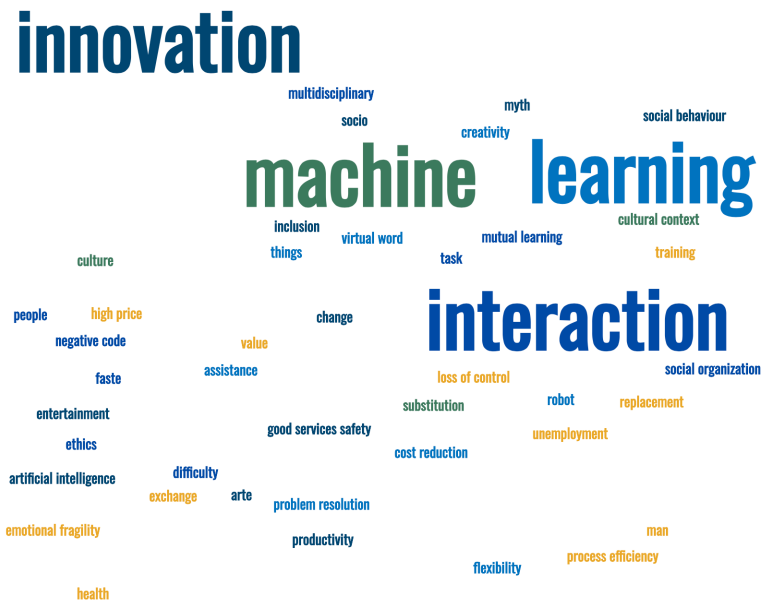

Figure 1: Coding

6.1.1. Positive aspects

"AI will not replace humans. AI will enable humans to ask the right questions to innovate." In other words, AI will augment the existing way humans solve confused business issues which require exploiting tools like machine learning, big data, data science, robotics, analytics, and so on, and AI will enable humans to ask the right questions to innovate.

Artificial intelligence solves recurring problems which permits people to focus on similar activities or general studies. Thus, people can generate inspiring and creative ideas, as well as develop disruptive and innovative business models. Humans interpret situations through a vision that machines do not have. Problems are solved by identifying their intellect despite the limitations they have.

Considering that AI is increasingly invading our lives, through for example, Alexa, Siri, Google Assistant. They are used as a means of aid in managing expenses, accomplish orders, in our homes. The same happens with computer games, social networks, human and non-human relationships. This interconnection between the virtual world and the real world will also have an impact on social behavior.

The way to make a new type of technology being accepted is to consider the close interaction between the two parties, humans, and machines. A combination of the objectivity of AI and the subjectivity of the human being will allow breaking rules from time to time, which is, ultimately, leads to disturbing developments using the right approach to achieve the desired success. AI and humans should not be seen as adversaries but as mutually supportive parties to utilize their respective strengths in a goal-oriented way.

6.1.2. Negative aspects

In generally, it was found an ambiance of discomfort about the negative aspects that the technology could bring for people work, especially mentioned by 1st year students. 64% of the students highlight the negative aspects of AI for humans.

The question of “AI for humans” has generated great questions underlined on the arguments presented by Stephen Hawking, that AI could, in fact, lead to the end of humanity, and it is a fact that AI can indeed take off on its own.

“The development of full artificial intelligence could spell the end of humans.... It would take off on its own, and re-design itself at an ever-increasing rate. Humans, who are limited by slow biological evolution, couldn’t compete, and would be superseded” [12].

Students presented several examples shown how dangerous AI could be for humans.

“I have an example in a very well-known movie, entitled "Avangers - Age of Ultron", released in 2015 by Marvel Studios where they show one of the main characters losing control of his own AI and Augmented Reality software, and in the sequence, the same software has partnered with a monster. In my particular case, this was an example of how AI can be very dangerous for humans in ways that these machines might not offer as much security as expected.” (Student A)

“It is noted that the advancement of the use of AI in the personal routine has brought a series of discussions. AI has so far been used in a seemingly harmless way, but it looks like it won't be that way over the years. There is a great need to establish rules regarding the application of AI in military matters, because there are already studies and experiments with weapons, planes and defense systems for the selection and elimination of enemies without the direct guidance of people.Therefore, the constant use of technology can also threaten thousands of jobs and eliminate human interaction in various functions, in addition to the imminent danger if AI manages to overcome the financial market or manipulate world leaders.” (Student B)

According to several studies on literature, and in the opinion of students, cooperation between AI and humans has shown that there is a better performance by combining the strengths of each party: leadership, teamwork, creativity, human social skills associated with speed, scalability, and quantitative

capability of AI. This collaboration can be carried out through, either by humans assisting machines or, through machines assisting humans.

As main contribution of this study we based our main thought on Jeanne. According to Jeanne, the CEO of the leading company in the field of robotics, which was the creator of Sophia, the humanoid robot, in an interview at the Techsauce Global Summit, facing the dilemma about robotics and Artificial Intelligence and their impact on society she stated that:

Humans have the tendency to think in black and white, in absolutes. There is the binary myth where the humans will be destroyed or the utopian belief where some people think that we will live harmoniously with robots and coexist with them in an advanced world. However, the reality may be a world where robots and humans are just going to have to learn to live with each other. [11].

Even when we predict the results of investigation, it is important to research about it and analyse the results in a specific context. Neither all students had the same opinion, at the beginning of a degree, students come with family and experiences context knowledge, as they learn deeply some subject, they change their opinion based on the practice of the initial unknown concepts.

7. Conclusion

AI systems are increasingly present and occupying a prominent place in various human activities. Most of the students consider that there is a fear of the total replacement of human workers by machines and AI software and therefore unemployment and economic problems will arise.

Conversely, a machine is an ally of humans. Humans help machines in training tasks: teaching to AI the expressions and patterns related to a given topic; training the machine's interaction with humans by developing assistants using multidisciplinary teams; explaining results, maintaining the correct use of technology. Machines help humans in amplifying cognition (improving the ability to analyze data and making decisions, promoting creativity). It also facilitates interaction through communication between customers and companies' employees, among other aspects.

Moreover, culture of confidence in the new world of artificial intelligence is an important aspect of building trust in AI. It makes AI responsive and transparent to the people who interact with those systems. Therefore, we know that it is necessary to look at it as a culture of collaboration adding team members with skills in cognitive sciences - such as anthropology - to help us understand insights and improve techniques to build confidence in the outcome.

We reach the pois where few technologies stimulate the imagination as much as those that try to replicate the human mind. From the Middle Ages to modern science fiction, many have fantasized about building living machines. And now, they have arrived, in a completely different way, in the form of artificial intelligence: as invisible software agents behind a vast spectrum of computing technologies that are redefining every aspect of our daily lives.

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