

The Role and Impact of Artificial Intelligence Across Various Sectors: Focus on Education"

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Abstract

In many ways, clever robots will replace or improve what humans can do in the future. The intelligence that tools or software show is called artificial intelligence. It's a branch of computer science. As a result of making life better in many ways, artificial intelligence is becoming a hot area of computer science. In the last 20 years, artificial intelligence has made a big difference in how well businesses, schools, and other places do their jobs. The area of artificial intelligence has led to the development of a technology called expert system, which is growing very quickly. The use of artificial intelligence is having a big effect on many areas of life. For example, expert systems are being used more and more to solve hard problems in business, medicine, education, weather predictions, and more. The standard and effectiveness of things have gone up in places that use artificial intelligence technology. This essay gives a general outline of this technology and the uses of artificial intelligence in various fields, with a focus on how it can be used in education. It also talks about what AI means, how it can be used to find, ideas, and the future.

Keywords: artificial intelligence (AI), artificial neurons (neural computer networks), expert system, heuristic, searching techniques

1. Introduction

It is claimed It is said that artificial intelligence is becoming more important in the fields of tactical research, management studies, and educational technology. People usually think of intelligence as the skill of being able to learn new things and use them to solve difficult problems. In the near future, smart machines will be able to do many things that humans can do now. Artificial intelligence is the study of tools and software that are smart enough to think, learn, talk, control things, and receive information. In 1956, John McCarthy came up with the term to describe the field of computer science that tries to make computers act like people. The study of computing is what allows us to think and move. Cognitive AI is not the same as psychology because it focusses on computation, and it is not the same as computer science because it focusses on Seeing, thinking, and doing. The tools are better and can do more with it. It works with the help of science theories (if-then sentences and logics) and artificial neurones (artificial neural network). Now that AI technologies are fully developed, they can really help people in many situations. AI's main fields are intelligent computer-aided commands, speech recognition, natural language processing, robotics and sensing systems, computer vision and scene recognition, and neural computing. Because of these, expert systems are a technology that is growing quickly and having a big effect on many areas of life. Neural networks, fuzzy reasoning, evolutionary computing, computer-aided instructions, and hybrid artificial intelligence are some of the different methods used in artificial intelligence.

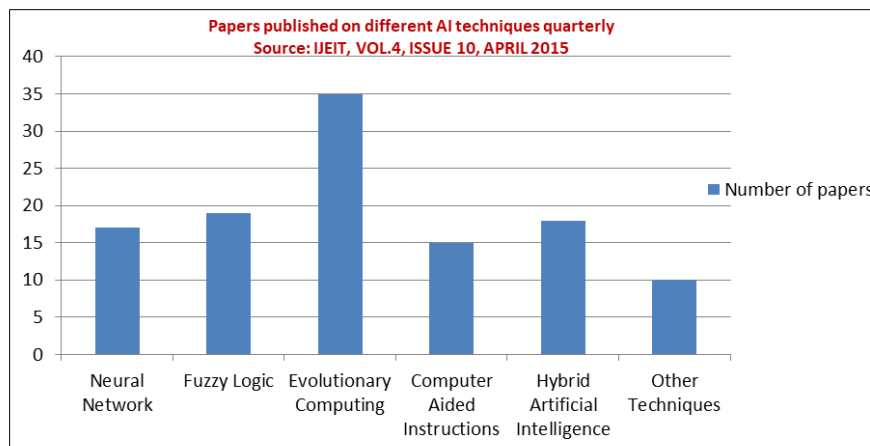


Fig 1: Papers published on different AI techniques quarterly.

The pros of artificial intelligence over natural intelligence are that it is more lasting, consistent, less expensive, easy to copy and spread, can be recorded, and can do some jobs much faster and better than humans. It is therefore useful in educational technology to use different AI-based teaching methods to make the teaching and learning process more useful and real.

2. Meaning of artificial intelligence

Artificial The word intelligence comes from the words artificial and intelligence. Where "artificial" means "not real" or "natural" and "intelligence" means "the power to think, reason, perceive, and learn." One way to describe artificial intelligence is as the branch of computer science that focusses on making tools that are smart enough to work and respond like people. A lot of different things come together to make it. creating artificial intelligence in machines that can do things like understand words, learn, plan, and solve problems. It is said that a system is clever when it can change based on its surroundings. Artificial intelligence is the process of training machines to think and act in ways that are similar to human intelligence. Making good use of limited resources is one way to describe artificial intelligence. So, artificial intelligence means making computer programs that can solve hard problems in the same way that people do. So it's also split into two parts: one is for machines to solve hard problems, and the other is for people to do the same things. You can also use the word "artificial intelligence" to talk about a feature of tools or programs: how smart the system is. The field of artificial intelligence (AI) combines science and tech to make tools that act intelligently. It brings together a lot of different areas, such as computer science, logic, and psychology.

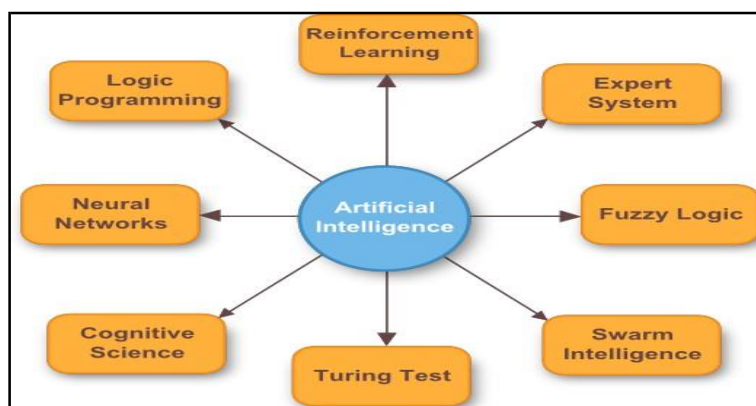


Fig 2: Factors included in AI

3. Scope of artificial intelligence in different areas

3.1. In the field of education

3.1.1. Artificial intelligence can automate basic activities in education, like grading

While AI may not ever be able to truly replace human grading, it's getting pretty close. It's now possible for teachers to automate grading for nearly all kinds of multiple choice and fill-in-the-blank testing and automated grading of student writing may not be far behind. Today, essay-grading software is still in its infancy and not quite up to par, yet it in college, grading homework and tests for large lecture courses can be tedious work, even when TAs split it between them. Even in lower grades, teachers often find that grading takes up a significant amount of time, time that could be used to interact with students, prepare for class, or work on professional development.

3.1.2. Educational software can be adapted to student needs

For students in kindergarten through graduate school, one of the most important ways that AI will change education is by allowing for more personalised learning. More and more adaptable learning games, tools, and software are already making some of this happen. These methods are based on what students want and need, putting more focus on certain subjects, going over things again that students still don't understand, and usually letting each student work at their own pace, whatever that is.

This type of personalised learning could be a way for students at different levels to work together in the same classroom, with machines helping them learn and teachers being there to help when they need it. Adaptive learning has already had a big effect on education across the country, especially through programs like Khan Academy. As AI gets better over the next few decades, it's possible that programs like these will only get better and grow.

3.1.3. It can point out places where courses need to improve

Teachers may not always be aware of gaps in their lectures and educational materials that can leave students confused about certain concepts. Artificial intelligence offers a way to solve that problem. Coursera, a massive open online course provider, is already putting this into practice. When a large number of students are found to submit the wrong answer to a homework assignment, the system alerts the teacher and gives future students a customized message that offers hints to the correct answer.

This type of system helps to fill in the gaps in explanation that can occur in courses, and helps to ensure that all students building the same conceptual foundation. Rather than waiting to hear back from the professor, students get immediate feedback that helps them to understand a concept and remember how to do it correctly the next time around.

3.1.4. Students could get additional support from AI tutors While there are obviously things that human tutors can offer that machines can't, at least not yet, the future could see more students being tutored by tutors that only exist in zeros and ones. Some tutoring programs based on artificial intelligence already exist and can help students through basic mathematics, writing, and other subjects.

These programs can teach students fundamentals, but so far aren't ideal for helping students learn high-order thinking and creativity, something that real-world teachers are still required to facilitate. Yet that shouldn't rule out the possibility of AI tutors being able to do these things in the future. With the rapid pace of technological advancement that has marked the past few decades, advanced tutoring systems may not be a pipe dream.

3.1.5. AI-driven programs can give students and educators helpful feedback

AI can not only help teachers and students to craft courses that are customized to their needs, but it can also provide feedback to both about the success of the course as a whole. Some schools, especially those with online offerings, are using AI systems to monitor student progress and to alert professors when there might be an issue with student performance.

These kinds of AI systems allow students to get the support they need and for professors to find areas where they can improve instruction for students who may struggle with the subject matter. AI programs at these schools aren't just offering advice on individual courses, however. Some are working to develop systems that can help students to choose majors based on areas where they succeed and struggle. While students don't have to take the advice, it could mark a brave new world of college major selection for future students.

3.1.6. It is altering how we find and interact with information

We rarely even notice the AI systems that affect the information we see and find on a daily basis. Google adapts results to users based on location, Amazon makes recommendations based on previous purchases, Siri adapts to your needs and commands, and nearly all web ads are geared toward your interests and shopping preferences.

These kinds of intelligent systems play a big role in how we interact with information in our personal and professional lives, and could just change how we find and use information in schools and academia as well. Over the past few decades, AI-based systems have already radically changed how we interact with information and with newer, more integrated technology, students in the future may have vastly different experiences doing research and looking up facts than the students of today.

3.1.7. It could change the role of teachers

To be clear, teachers will always play an important part in education. But with the rise of new technologies like smart computers, that job and what it involves may change. As we've already talked about, AI can do things like grade papers, help students learn better, and maybe even replace tutors in the real world. But AI could also be used in a lot of other ways when teaching. AI systems could be designed to offer advice, giving students a place to ask questions and find answers. They might even be able to teach very basic course materials instead of teachers. For the most part, though, AI will change the teacher's job to that of a guide.

Teachers will add to AI lessons, help students who are having trouble, and give students opportunities to connect with real people and gain hands-on experience. Some of these changes are already happening in the classroom thanks to technology. This is especially true in schools that use the split classroom model or are online.

3.1.8. AI can make trial-and-error learning less intimidating

Trial and error is a critical part of learning, but for many students, the idea of failing, or even not knowing the answer, is paralyzing. Some simply don't like being put on the spot in front of their peers or authority figures like a teacher. An intelligent computer system, designed to help students to learn, is a much less daunting way to deal with trial and error. Artificial intelligence could offer students a way to experiment and learn in a relatively judgment-free environment, especially when AI tutors can offer solutions for improvement. In fact, AI is the perfect format for supporting this kind of learning, as AI systems themselves often learn by a trial-and-error method.

3.1.9. Data powered by AI can change how schools find, teach, and support students

Smart data gathering, powered by intelligent computer systems, is already making changes to how colleges interact with prospective and current students. From recruiting to helping students choose the best courses, intelligent computer systems are helping make every part of the college experience more closely tailored to student needs and goals.

Data mining systems are already playing an integral role in today's higher-ed landscape, but artificial intelligence could further alter higher education. Initiatives are already underway at some schools to offer students AI-guided training that can ease the transition between college and high school. Who knows but that the college selection process may end up a lot like Amazon or Netflix, with a system that recommends the best schools and programs for student interests.

3.1.10. AI may change where students learn, who teaches them, and how they acquire basic skills

While major changes may still be a few decades in the future, the reality is that artificial intelligence has the potential to radically change just about everything we take for granted about education.

Using AI systems, software, and support, students can learn from anywhere in the world at any time, and with these kinds of programs taking the place of certain types of classroom instruction, AI may just replace teachers in some instances (for better or worse). Educational programs powered by AI are already helping students to learn basic skills, but as these programs grow and as developers learn more, they will likely offer students a much wider range of services.

3.2 Language understanding:

The ability to "understand" and respond to the natural language. To translate from spoken language to a written form and to translate from one natural language to another natural language.

1. Speech Understanding
2. Semantic Information Processing (Computational Linguistics)
3. Question Answering
4. Information Retrieval
5. Language Translation

3.3 Learning and adaptive systems:

The ability to adapt behavior based on previous experience, and to develop general rules concerning the world based on such experience.

1. Cybernetics
2. Concept Formation

3.4 Problem solving

Ability to formulate a problem in a suitable representation, to plan for its solution and to know when new information is needed and how to obtain it.

1. Inference (Resolution-Based Theorem Proving, Plausible Inference and Inductive Inference)
2. Interactive Problem Solving
3. Automatic Program Writing
4. Heuristic Search

3.5 Robots

A combination of most or all of the above abilities with the ability to move over terrain and manipulate objects.

1. Exploration
2. Transportation/Navigation
3. Industrial Automation (e.g., Process Control, Assembly Tasks, Executive Tasks)
4. Security
5. Other (Agriculture, Fishing, Mining, Sanitation, Construction, etc.)
6. Military

7. Household

3.6 Games

The ability to accept a formal set of rules for games such as Chess, Go, Kalah, Checkers, etc., and to translate these rules into a representation or structure which allows problem-solving and learning abilities to be used in reaching an adequate level of performance.

3.7 For emergency services

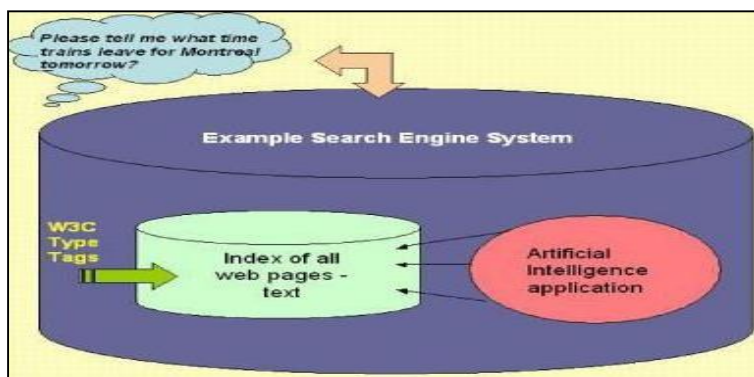
When we allow handling emergency to A.I then it is more beneficial for us. Because when some emergency come like fire, flood then we can send metal or silicon firefighters to save people because they have no danger to loss life, machines can also defy higher temperatures and can tolerate smoke easily and can search easily in close-quarters by using lasers and radar where as people may not be able to see. Firefighting was first field where artificial intelligent machines were used but now this concept is used in many fields like driving ambulances, handling dangerous law enforcement situations, and even cleaning up hazardous leaks or spills are prime examples. Now Navy is using this technology on the water, and some are developing it for use in cities.

3.8 For Entertainment

We can apply artificial intelligence to the world of music, can make artificial director which see the real world and can generate the stories. We can make the robots which compose music and pitch and robots can create your favorite songs. New technology is also able to restore to life of that stars which are dead like Tupac Shakur and Michael Jackson etc.

3.9 For providing services to customers

Now a day's, for providing services to the customer artificial intelligence is using in place of human being. When any person does calculation like preparing bill, handling account information he can do calculation error but machine do calculation properly and no mistake is done by the machine. Artificial intelligence also has a component that is natural language processing with the help of which human being can directly communicate with machine in their natural language and can get services directly.



In Heuristic Classification

Fig 3: How a search engine works: it gathers information from many places and puts it all in one place. In One of the main things that an expert system does is collect heuristic classification. Many search methods are used for this, such as It tries to find the best way to solve a complicated problem for the least amount of money and time. An example is hill-climbing. Take the choice of whether to accept a credit card buy as an example.

4. Searching techniques in artificial intelligence

In AI for finding the solution of problem searching has to be done because solution is not known in advance. For it AI

programs are developed which do the searching process for solution because solution steps are not known before hand and have to be found out. For doing searching following steps are required. So we can say that searching is a process which transform initial state to goal state.

1. Initial state
2. A set of legal operators
3. Goal state or final state

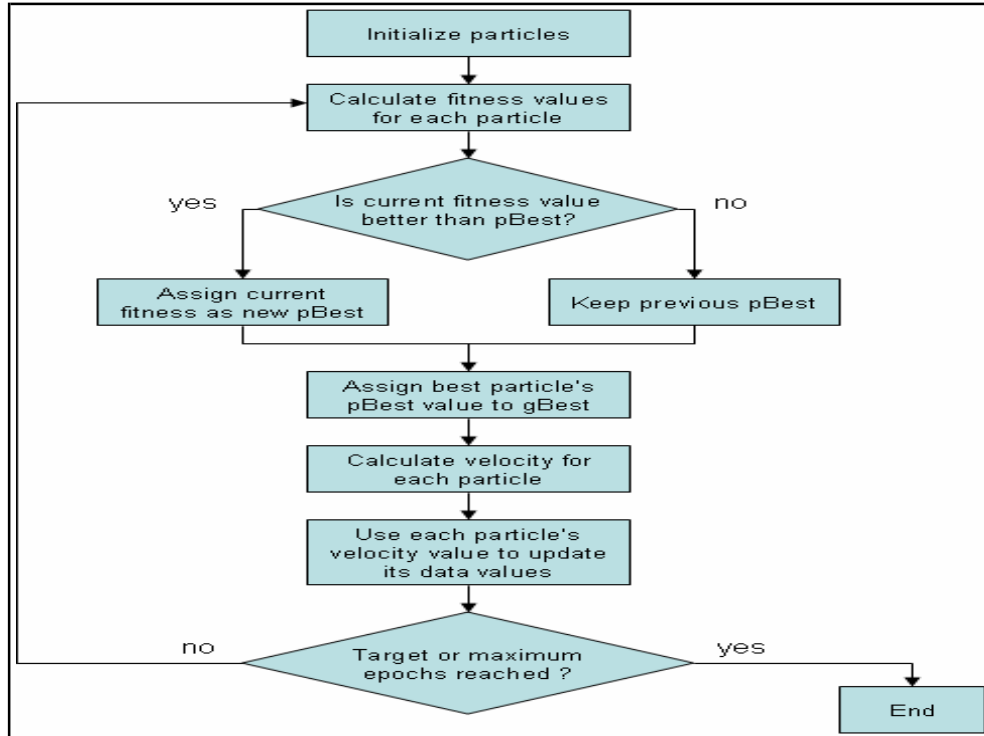


Fig 4: Example of searching in AI

Searching in AI is broadly classified into two parts-

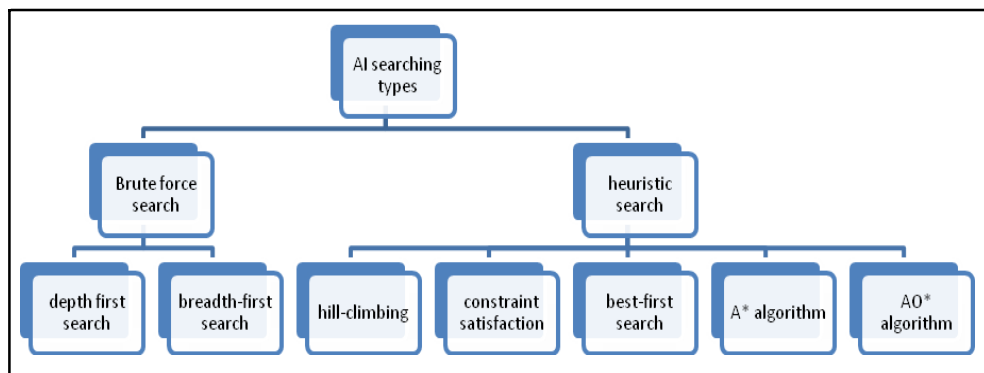


Fig 5: Different searching types in AI

5. Invention in the field of AI

John McCarthy, an American scientist, came up with the word "artificial intelligence" and is known as its founder. He worked with computers and thought, and he was a well-known figure in the early days of AI. Many scientists from different areas, such as math, psychology, engineering, economics, and political science, began working on making a computer mind that could think and act like a person in the 1940s and 1950s. between 1940 and 1950, and then started school in 1956. In order to use the semantic net, Ross Quillian wrote the first AI program. To describe a semantic net, we can compare it to a graph, where the points are ideas and the arrows connect them. In February 2011, a test called Jeopardy! How do you know it was just a show? And the battle was between Watson, IBM's question-answering

system, and two other systems.

there were winners named Brad Rutter and Ken Jennigs, and that method beat them by a large amount.

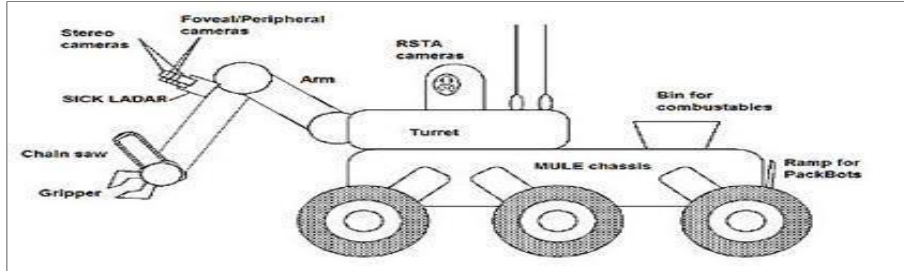


Fig 6: Example of robot

6. The future of AI

It is true that many experts are doing research in the field of Artificial intelligence and in future machines will become more and more powerful. But anything which has advantages there exist disadvantages also so there can be ethical issues related to machines. For example, if any machine is made for very sensitive work and did any mistake than who will be responsible. If an AI program is made for diagnosis purpose and it gives the wrong answer, then we cannot claim the doctor for it. So for it policy will have to make. And in future such kind of machines will be developed which will communicate with us same like the human and will be able to guess what should be done in which situation.

7. Conclusion

In the area of artificial intelligence, ideas are used to teach robots how to think rationally. A lot of progress has been made in many areas thanks to artificial intelligence methods in the last 20 years. Machine learning and AI will continue to become more and more important in many areas. What this paper is about is the idea of artificial intelligence and how it can be used in different areas, especially in "the field of education." As everyone knows, artificial intelligence is the clever way that professionals teach machines to behave. As you all know, AI has made our lives easier in every way, whether we're writing articles, playing games, or making important decisions. Many expert minds can work together in any machine, making it stronger than a single expert mind. One machine can do a lot of work, and the good thing about it is that it never gets tired. Now, these kinds of robots will be made that have feelings. This will stop people from being lonely. But there's another side to it that can be dangerous for us. If we rely on those tools for everything, it could ruin our lives because we wouldn't do any work and would be too lazy. One more thing is that it can't make you feel like a person. Because of this, tools should only be used when they are really needed.

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