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COMPREHENSIVE DISCRIPTION ON ARTIFICIAL INTELLIGENCE

G VAMSHI KRISHNA[1], G VENKATESHWARALU[2], M.SIVA SUBRAMANYAM[3], A PRANAY CHOWDARY[4], D SUSHMITA PRIYA[5], K SRINITHA[6]

[1] Assistant Professor, Department of CSE, Malla Reddy Engineering College (Autonomous), Hyderabad, India

[2] Assistant Professor , Department of CSE, Malla Reddy Engineering College (Autonomous), Hyderabad, India

[3] Assistant Professor, Department of CSE, Malla Reddy Engineering College (Autonomous), Hyderabad, India

[4,5,6] UG Student, Department of CSE, Malla Reddy Engineering College (Autonomous), Hyderabad, India

ABSTRACT

Artificial intelligence (AI) is the intelligence of machines and the branch of computer science that aims to create it. The field was founded on the claim that a central property of humans, intelligence—the sapience of Homo sapiens —can be so precisely described that it can be simulated by a machine. This raises philosophical issues about the nature of the mind and limits of scientific hubris, issues which have been addressed by myth, fiction and philosophy since antiquity. Artificial intelligence has been the subject of optimism, but has also suffered setbacks and, today, has become an essential part of the technology industry, providing the heavy lifting for many of the most difficult problems in computer science. Mechanical or "formal" reasoning has been developed by philosophers and mathematicians since antiquity. The study of logic led directly to the invention of the programmable digital electronic computer, based on the work of mathematician Alan Turing and others. The general problem of simulating (or creating) intelligence has been broken down into a number of specific sub-problems. These consist of particular traits or capabilities that researchers would like an intelligent system to display. The traits have received the most attention, like Deduction, Reasoning, Problem solving, learning, motion capturing and manipulation, etc. Artificial intelligence has been used in a wide range of fields including medical diagnosis, stock trading, robot control, law, scientific discovery and toys. However, many AI applications are not perceived as AI: "A lot of cutting edge AI has filtered into general applications, often without being called AI because once something becomes useful enough and common enough it's not labeled AI anymore.

INTRODUCTION

The field was founded on the claim that a property of humans, intelligence—the sapience of Homo sapiens —can be so precisely described that it can be simulated by a machine. This raises philosophical issues about the nature of the mind and limits of scientific ubris, issues which have been addressed by myth, fiction and philosophy since antiquity. Artificial

intelligence has been the subject of optimism, but has also suffered setbacks and, today, has become an essential part of the technology industry, providing the heavy lifting for many of the most difficult problems in computer science. Thinking machines and artificial beings appear in Greek myths, such as Talos of Crete, the golden robots. Human likenesses believed to have intelligence were built in every major civilization: animated statues were seen in Egypt and Greece and humanoid automatons were built by Yan Shi, Hero of Alexandria, Al-Jazari and Wolfgang von Kempelen. Mechanical or "formal" reasoning has been developed by philosophers and mathematicians since antiquity. The study of logic led directly to the invention of the programmable digital electronic computer, based on the work of mathematician Alan Turing and of mathematician Alan Turing and others. simulate any conceivable act of mathematical deduction. This, along with recent discoveries in neurology, information theory and cybernetics, inspired a small group of researchers to begin to seriously consider the possibility of building an electronic brain The field of AI research was founded at a conference on the campus of Dartmouth College in the summer of 1956. The attendees, including John McCarthy, Marvin Minsky, Allen Newell and Herbert Simon, became the leaders of AI research for many decades. They and their students wrote programs that were, to most people, simply astonishing: computers were solving word problems in algebra, proving logical theorems and speaking English. By the middle of the 1960s, research in the U.S. was heavily funded by the Department of Defense and laboratories had been established around the world. AI's founders were profoundly optimistic about the future of the new field: Herbert Simon predicted that "machines will be capable, within twenty years, of doing any work a man can do" and Marvin Minsky agreed writing that "within a generation ... the problem of creating 'artificial intelligence' will substantially be solved" In the 1990s and early 21st century, AI achieved its greatest successes, albeit somewhat behind the scenes. Artificial intelligence is used for logistics, data mining, medical diagnosis and many other areas throughout the technology industry. The success was due to several factors: the incredible power of computers today (see Moore's law), a greater emphasis on solving specific sub problems, the creation of new ties between AI and other fields working on similar problems, and above all a new commitment by researchers to solid mathematical methods and rigorous scientific standards.

Literature Review on Artificial Intelligence

Research on artificial intelligence in the last two decades has greatly improved performance of both manufacturing and service systems. Currently, there is a dire need for an article that presents a holistic literature survey of worldwide, theoretical frameworks and practical experiences in the field of artificial intelligence. This paper reports the state-ofthe-art on artificial intelligence in an integrated, concise, and

elegantly distilled manner to show the experiences in the field. In particular, this paper provides a broad review of recent

Trends in computer science show that various aspects of artificial intelligence (AI) are emerging, and other trends show that these advances are being applied to create intelligent information systems. Although the field of AI has not been very successful in the past, these trends suggest that it may finally arrive in the next few years. This work grew out of the challenges that AI possesses in view of the rise and growing nature of information technology worldwide that has characterised business- and non-business organisational development (Barzilay et al. (2002), Baxter et al. (2001), Darwiche and Marquis (2002), Gao and Culberson (2002), Tennenholtz (2002) and Wiewwiora (2003)).

The necessity for research in AI is being motivated by two factors that are (i) to give the new entrants into the AI field an understanding of the basic structure of the AI literature (Brooks (2001), Gamberger and Lavrac (2002), Kim (1995), Kim and Kim (1995), Patel-Schneider and Sebastiani (2003) and Zanuttini (2003)). As such, the literature discussed here answers the common query, "why must I study AI?" (ii) the upsurge of interest in AI that has prompted an increased interest and huge investments in AI facilities. The first major area considered here is that of reasoning. Research on reasoning has evolved from the following dimensions: case-based, non-monotonic, model, qualitative, automated, spatial, temporal and common sense. For an illustrative example, the case-based reasoning (CBR) is briefly discussed. In CBR, a set of cases stored in a case base is the primary source of knowledge. Cases represent specific experience in a problem-solving domain, rather than general rules. The main activities when solving problems with cases are described in the case-based reasoning cycle. This cycle proposes the four steps: relieve, reuse, revise and retain. First, the new problem to be solved must be formally described as a case (new case). Then, a case that is similar to the current problem is retrieved from the case base. The solution contained in this retrieved case is reused to solve the new problem with a new solution obtained and presented to the user who can verify and possibly revise the solution. The revised case (or the experience gained during the case-based problem solving process) is then retained for future problem solving. Detailed information on "dimensions" or how they are related could be obtained from the relevant sources listed in the references (Debruyne and Bessiere (2001), Halpern (2000), Halpern (2001), Renz and Nebel (2001), Singh et al. (2002) and Straccia (2001)).

Genetic algorithm is an important and growing part of the artificial intelligence literature with numerous research findings. A good example of such studies could be found in Turney (1995). The study introduces ICET, a new algorithm for cost-sensitivity classification. ICET uses a genetic algorithm to evolve a population of biases for a decision tree induction algorithm. ICET is compared here with three

other algorithms for cost-sensitive classification - EG2, CS-ID3, and IDX- and also with C4.5, which classifies without regard to cos

Methodology

Two closely related aspects of artificial intelligence that have received comparatively little attention in the recent literature are research methodology, and the analysis of computational techniques that span multiple application areas. We believe both issues to be increasingly significant as Artificial Intelligence matures into a science and spins off major application efforts. It is imperative to analyze the repertoire of AI methods with respect to past experience, utility in new domains, extensibility, and functional equivalence with other techniques, if AI is to become more effective in building upon prior results rather than continually reinventing the proverbial wheel. Similarly, awareness of research methodology issues can help plan future research buy learning from past successes and failures. We view the study of research methodology to be similar to the analysis of operational AI techniques, but at a meta-level ; that is, research methodology analyzes the techniques and methods used by the researchers themselves, rather than their programs, to resolve issues of selecting interesting and tractable problems to investigate, and of deciding how to proceed with their investigations. A public articulation of methodological issues that typically remain implicit in the literature may provide some helpful orientation for new researchers and broaden the perspective of many AI practitioners.

FUTURE OF ARTIFICIAL INTELLIGENCE

Beyond negotiation, Moore says CMU is betting several other AI areas are going to be hugely important in the near future. • Self Driving Cars. • Improved Medical Care & Treatment. • Open up doors to future explorations.

 Idea of Artificial Intelligence is being replaced by Artificial life, or anything with a form or body.

 The consensus among scientists is that a requirement for life is that it has an embodiment in some physical form, but this will change. Programs may not fit this requirement for life yet.

 Applications of AI in planning and scheduling

 Applications of AI in Robots

 Artificial intelligence in the manufacturing field

 Artificial intelligence in maintenance

 Applications of AI in environmental pollution

CONCLUSION

AI is at the centre of a new enterprise to build computational models of intelligence. The main assumption is that intelligence (human or otherwise) can be represented in terms of symbol structures and symbolic operations which can be programmed in a digital computer. There is much debate as to whether such an appropriately programmed computer would be a mind, or would merely simulate one, but AI researchers need not wait for the conclusion to that debate, or for

the hypothetical computer that could model all of human intelligence. Aspects of intelligent behavior, such as solving problems, making inferences, learning, and understanding language, have already been coded as computer programs, and within very limited domains, such as identifying diseases of soybean plants, AI programs can outperform human experts. Now the great challenge of AI is to find ways of representing the commonsense knowledge and experience that enable people to carry out everyday activities such as holding a wide-ranging conversation, or finding their way along a busy street. Conventional digital computers may be capable of running such programs, or we may need to develop new machines that can support the complexity of human thought.

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