

Chapter 2

Artificial Intelligence in Computer Science: An Overview of Current Trends and Future Directions

Arun Prasad G


Hindusthan College of Arts & Science, India

A. V. Senthil Kumar

 <https://orcid.org/0000-0002-8587-7017>

Hindusthan College of Arts & Science, India

Priyanka Sharma


 <https://orcid.org/0000-0002-9503-1170>

*Swami Keshvanand Institute of Technology,
Management & Gramothan, India*

Indrarini Dyah Irawati

Telkom University, Indonesia

Chandrashekar D. V.

 <https://orcid.org/0000-0001-9798-0305>

T.J.P.S. College, India

Ismail Bin Musirin

Universiti Teknologi MARA, Malaysia

Hesham Mohammed Ali Abdullah

Jouf University, Saudi Arabia

Manjunatha Rao L

Dr. Ambedkar Institute of Technology, India

ABSTRACT

Artificial intelligence (AI) is a rapidly evolving field that has seen tremendous growth in recent years. In this chapter, the authors provide an overview of current trends in AI and their applications in computer science. They also discuss the future directions of AI research and their potential impact on the field of computer science. They start by introducing the basic concepts of AI and its various subfields. Then, they present an overview of current trends in AI research, including machine learning, natural language processing, computer vision, and robotics. The authors discuss how these trends are applied in computer science, such as autonomous vehicles, fraud detection, and personalized medicine. Finally, they discuss the future directions of AI research, including the development of more explainable AI systems, the integration of AI with other emerging technologies, and the ethical considerations of AI.

DOI: 10.4018/979-8-3693-1301-5.ch002

INTRODUCTION

Artificial intelligence (AI) has emerged as a game-changing technology that is transforming the way we interact with machines and the world around us. With the advent of machine learning algorithms, deep learning, natural language processing, and computer vision, AI has made significant strides in recent years, with the potential to transform many areas of computer science and beyond. (Berente et al., n.d.) From robotics and autonomous systems to healthcare, finance, education, and cybersecurity, AI is being used to address a wide range of complex challenges and improve our lives in numerous ways.

As AI continues to evolve, it is becoming increasingly sophisticated and capable of performing tasks that were once thought to be the exclusive domain of humans. With the ability to analyze vast amounts of data, detect patterns, and make decisions in real time, AI has the potential to accelerate scientific discovery, improve healthcare outcomes, boost economic productivity, and enhance the quality of life for people around the globe.

- AI is “the theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.” (Chassignol et al., 2018)

At the same time, the rapid leap of technological transformation also poses new challenges and risks, including job displacement, prejudice and discrimination, and security threats. As AI continues to transform the way we live and work, it is important to consider the ethical and social implications of these technologies and ensure that they are developed and used in a responsible and accountable manner. (*Evolving Artificial Intelligence.*, n.d.)

This chapter provides an overview of the current trends and future directions in AI research, as well as the applications of Artificial Intelligence in various fields of computer science. It also explores the challenges and opportunities that lie ahead in AI research, and emphasizes the importance of ethical and responsible use of AI to ensure that these technologies are used to maximize their benefits while mitigating potential risks and challenges. (Holzinger et al., 2019) Ultimately, by working together to develop and deploy AI in a responsible and ethical manner, we can unlock the full potential of this transformative technology and create a brighter future for us all.

BACKGROUND AND OVERVIEW OF AI

Artificial Intelligence (AI) is a rapidly growing field that has its roots in computer science and engineering. (Mccarthy, 2004) The idea of creating machines that could perform tasks typically associated with human intelligence dates back to the 1950s. However, it was not until the 21st century that the concept of AI began to take shape in a meaningful way, with the development of machine learning algorithms and neural networks. Today, AI is a major area of research in computer science, with applications ranging from computer vision to natural language processing and robotics.

AI can be broadly defined as the ability of machines to perform tasks that typically require human intelligence, such as recognizing patterns, understanding natural language, and making decisions. (Minsky, 1961) At its core, AI is about creating machines that can learn from data and adapt to new situations. This is typically achieved through machine learning, a subfield of AI that focuses on the development of algorithms that can learn from data and make predictions or decisions based on that data.

16 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/artificial-intelligence-in-computer-science/330397

Related Content

A Lisibility Assessment for Mobile Phones

Francisco V. Cipolla-Ficarra, Jacqueline Almaand Jim Carré (2018). *Technology-Enhanced Human Interaction in Modern Society* (pp. 103-121).

www.irma-international.org/chapter/a-lisibility-assessment-for-mobile-phones/189839

Training Courses to Educate in Investigation Using Artificial Intelligence Tools and Apps

Laura Bucci (2024). *Bioethics of Cognitive Ergonomics and Digital Transition* (pp. 105-121).

www.irma-international.org/chapter/training-courses-to-educate-in-investigation-using-artificial-intelligence-tools-and-apps/351362

Organizing Contextual Data in Context Aware Systems: A Review

Umar Mahmud (2016). *Handbook of Research on Human-Computer Interfaces, Developments, and Applications* (pp. 273-303).

www.irma-international.org/chapter/organizing-contextual-data-in-context-aware-systems/158875

Negative Exponent Fraction: A Strategy for a New Virtual Image into the Financial Sector

Francisco V. Cipolla-Ficarra (2014). *Advanced Research and Trends in New Technologies, Software, Human-Computer Interaction, and Communicability* (pp. 255-268).

www.irma-international.org/chapter/negative-exponent-fraction/94235

Harris Hawk Optimization Study of Geosynthetic-Encased Stone Columns Supporting a Railway Embankment in Soft Clay

M. A. Balasubramani, R. Venkatakrishnaiah and K. V. B. Raju (2023). *Recent Developments in Machine and Human Intelligence* (pp. 241-255).

www.irma-international.org/chapter/harris-hawk-optimization-study-of-geosynthetic-encased-stone-columns-supporting-a-railway-embankment-in-soft-clay/330332