# Chapter 19
# Converging Technologies:
## AI at the Intersection of Data, Ethics, and Innovation

**Kaushalya Thopate**
http://orcid.org/0000-0001-7163-1262
*Vishwakarma Institute of Technology, India*

**Mayuri Gawade**
http://orcid.org/0009-0009-7431-6992
*Vishwakarma Institute of Technology, India*

**Rajesh Jalnekar**
*Vishwakarma Institute of Technology, India*

**Gopal Upadhye**
http://orcid.org/0000-0002-6244-7786
*Vishwakarma Institute of Technology, India*

**Sheetal Phatangare**
*Vishwakarma Institute of Technology, India*

**Tanvi Pokale**
http://orcid.org/0009-0007-2888-1806
*Vishwakarma Institute of Technology, India*

## ABSTRACT

*This article offers a general overview of AI, including the definition, scope, historical evolution, and underlying sub-categories of AI. AI refers to the ability of machines—especially computers—to perform tasks that would normally require human intelligence; such tasks include learning from experience, recognizing patterns, and making decisions. The chapter offers a historical account of AI, from its mythological and early philosophical birth to its emergence as a formal field in the 1950s, discussing some of its landmark events—such as the Turing Test and the Dartmouth Conference. The article explores technological and theoretical innovations that have influenced the development of AI, such as the rapid increase in volume and diversity of data, the big data revolution and its impact on AI, the industrialization and commercialization of AI, and the development of neural networks. A fundamental segregation—some experts would say division, for them—is between Narrow AI (i.e., systems made for a particular purpose) and General AI (machines that can think like humans).*

## INTRODUCTION TO ARTIFICIAL INTELLIGENCE

AI (Artificial Intelligence) The branch of computer science that is focused on creating systems that can perform tasks that would normally require human intelligence. Some of these tasks are: reasoning;

DOI: 10.4018/404028

learning from experience; decision making; recognizing natural language; and identifying patterns. To simplify it, AI is nothing but designing algorithms and models to let machines perform smartly in order to enhance productivity, efficiency, and problem solving across many domains.

Etymology of the term: AI The term "Artificial Intelligence" was introduced by John McCarthy in 1956 at the Dartmouth Conference, and since then, the research field of AI was established. Since that time AI has moved from rule based systems and expert systems to machine learning and deep learning. Artificial intelligence today is better than humans at lots of stuff — computers can now compete in chess against the world's best players, perform intricate calculations and recognize images, to name a few — so it could be an opportunity to assist or even replace human decision-making in some situations (Russell, S., & Norvig, P. (2021)).

AI is very broad and naturally consists of or intersects with numerous subfields, such as

- Machine Learning (ML): The ability for machines to learn from data and to improve their performance, over time without being explicitly programmed.
- Natural Language Processing (NLP): how computer and humans communicate, examples include translation, sentiment analysis and chatbots.
- Computer Vision: Enables machines to make sense of visual data from the world, including images and video, to detect and recognize objects.
- Robotics: It is the science of designing intelligent machines that can work, move and perform tasks in the physical world.
- Example are "Expert Systems" where knowledge in a particular domain is used to make decision solving problems in this domain domain such as diagnosis in Medicine.

Application of AI is growing fast in different fields such as health care, finance, education, production and entertainment. In the healthcare industry, AI is being utilized to predict disease outbreaks, help with diagnoses, and personalize treatment. In finance, it drives fraud detection, risk assessment and algorithmic trading. In the education sector, AI enables personalized learning and automates various aspects of administration. The ultimate goal of AI is to be able to create systems that can perform cognitive and behavioral tasks at the level that humans can perform them, with some goals reaching as far as creating AGI (Artificial General Intelligence), where machinery has the ability to do any intellectual task that humans can. The fourth dimension of AI is also a topic that falls under the broader AI umbrella: values and ethics, and social implications -- data privacy and algorithmic bias, job displacement and accountability. This concern has given rise to rapidly mounting interest in the field of AI ethics and governance, which aims to make the development and deployment of AI responsible and beneficial for society (Turing, A. M. (1950)).

AI in a nutshell In short, AI is a disruptive technology with a broad impact over many areas of business and society. Its story is not just of a technical nature, but it is also intrinsically linked to the social sphere, one that is concomitant with the tracing of its social consequences, a responsible insertion in human culture.