# Unit 1

# Introduction to AI

# Brief History of AI

- 1943 McCulloch & Pitts: Boolean circuit model of brain

- 1950 Turing's "Computing Machinery and Intelligence"

- 1956 Dartmouth meeting: "Artificial Intelligence" adopted

- 1950s Early AI programs, including Samuel's checkers program, Newell & Simon's Logic Theorist, Gelernter's Geometry Engine

- 1965 Robinson's complete algorithm for logical reasoning

- 1966—73 AI discovers computational complexity, neural network research almost disappears

- 1969—79 early development of knowledge-based systems

- 1980-- AI becomes an industry

- 1986-- Neural networks return to popularity

- 1987-- AI becomes a science

- 1995-- The emergence of intelligent agents

- 2000–  implementation of machine learning algorithms in various fields.

# Benefits of AI

- **Increased Efficiency:** AI can process and analyze vast amounts of data quickly, leading to enhanced productivity across various sectors, such as healthcare, finance etc.

- **Improved Decision-Making:** AI algorithms can assist in making informed decisions by providing insights from data analysis, predicting trends, and identifying patterns.

- **Innovation in Services:** AI has the potential to revolutionize services, such as personalized recommendations in e-commerce, predictive maintenance in industries, and tailored learning experiences in education.

- **Enhanced Safety:** In areas like transportation (e.g., autonomous vehicles) and healthcare (e.g., diagnostics), AI can help reduce human error and improve outcomes.

# Risks of AI

- **Job Displacement:** Automation driven by AI can lead to significant job losses in certain sectors, particularly in routine and manual jobs.

- **Bias and Discrimination:** AI systems can perpetuate and even exacerbate existing biases if they are trained on biased data, leading to unfair treatment in areas like hiring, law enforcement, and lending.

- **Security Threats:** AI can be used maliciously for cyber attacks, such as automated hacking or deepfakes, which can undermine trust in information systems.

- **Loss of Control:** As AI systems become more autonomous, there is a risk that humans may lose control over critical systems.

# Ethical Implications of AI

- **Autonomy vs. Control:** The balance between AI autonomy and human oversight raises ethical questions about accountability, especially in life-critical applications (e.g., healthcare decisions).

- **Transparency and Explainability:** Many AI systems operate as "black boxes," making it challenging to understand how decisions are made, raising concerns about accountability and trust.

- **Informed Consent:** The use of AI in data collection and processing raises issues about user consent and awareness regarding how their data is used.

- **Moral Responsibility:** Determining who is responsible for the actions of AI systems—developers, users, or the AI itself—poses significant ethical dilemmas.

# AI and Society

- **Social Inequality:** AI can exacerbate social inequalities if access to AI technologies and benefits is unevenly distributed, potentially widening the digital divide.

- **Cultural Impact:** AI influences cultural norms and practices, from content creation to social interactions, prompting discussions about authenticity and human connection.

- **Public Perception:** Society's view of AI can impact its adoption; fear of job loss and distrust in technology can hinder progress and acceptance

- **AI in Governance:**

# Work and Automation

- Job Creation Vs Job loss
- Reskilling Vs Upskilling
- Workplace Transformation
- Changing Skill Requirements

# Governance and Regulations of AI

Key Principles of AI Governance

- Transparency

- Accountability

- Fairness

- Privacy

- Safety

# Stakeholders in AI Governance:

- Governments and regulatory bodies

- Private sector companies

- Civil Society and advocacy groups

- Academic Institutions and researchers