Unit 1: Introduction to AI

Instructor: Ruturaj Reddy

What is AI?

- Machine or computer program that learns how to do tasks that require forms of intelligence and are usually done by humans

- The ability for a computer to think and learn
- human-made thinking power

Why use AI?

- better decisions
- improving core business processes
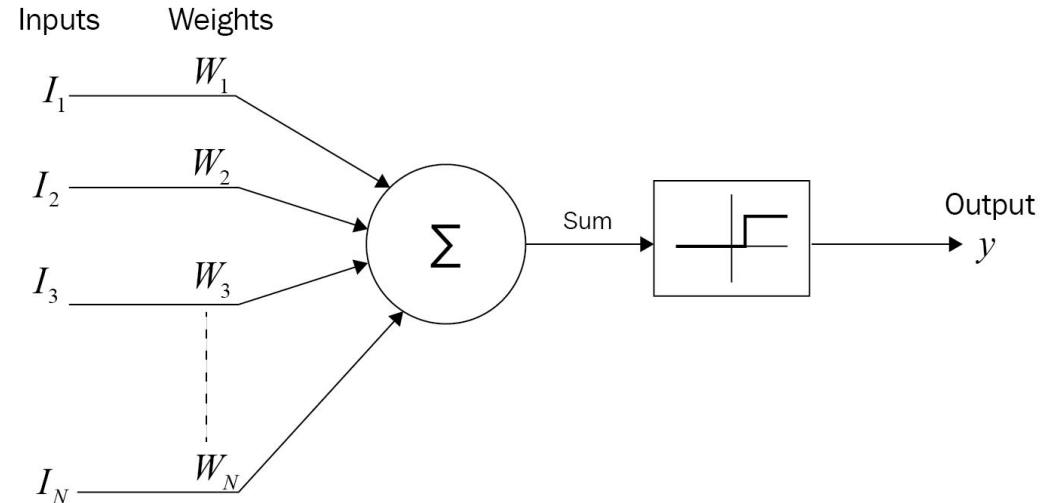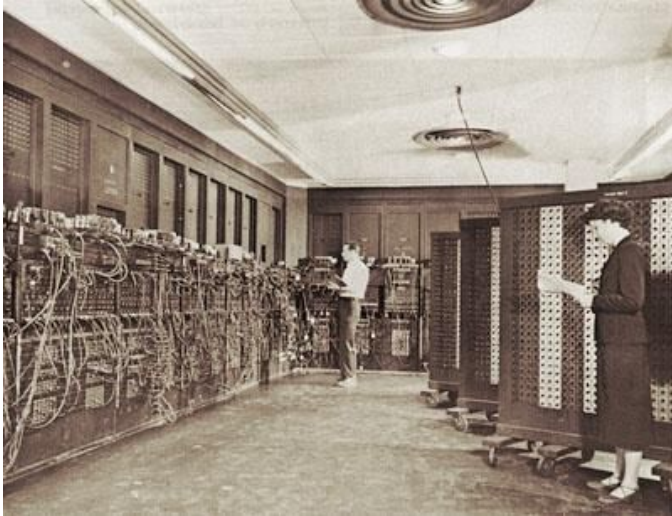- increasing both the speed and accuracy of strategic decision-making processes

- It enables human capabilities –
  - understanding, reasoning, planning, communication and perception

History of AI

1941 - Initial Computer

1943 - First work recognised by Warren McCulloch and Walter Pitts

Proposed a model of AI neurons
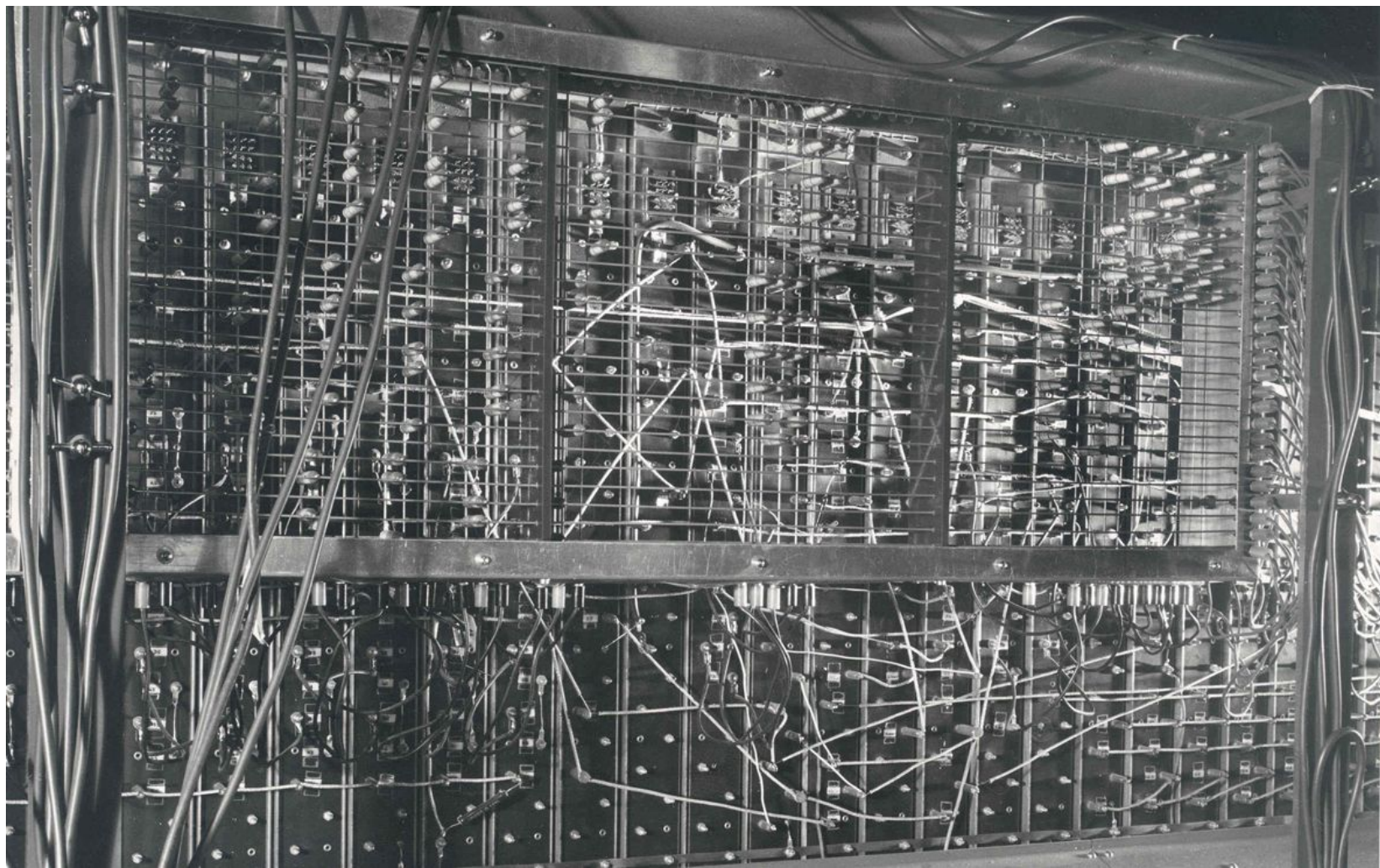
History of AI

1949 - Donald Hebb

      Updated and modified connection strength between neurons called Hebbian Learning

History of AI

1950 - Alan Turing proposed a test "Computing Machinery and Intelligence"

History of AI

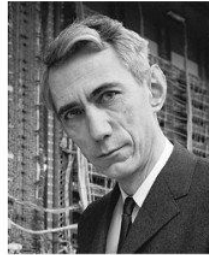1956 - Birth of the term AI at the Dartmouth Conference

**1956 Dartmouth Conference:
The Founding Fathers of AI**
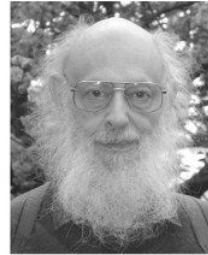
John MacCarthy   Marvin Minsky   Claude Shannon   Ray Solomonoff   Alan Newell

Herbert Simon   Arthur Samuel   Oliver Selfridge   Nathaniel Rochester   Trenchard More
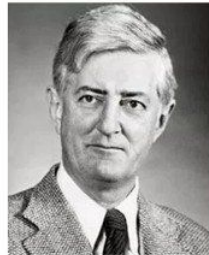
History of AI

1966 - Joseph Weizenbaum created the first chatbot "ELIZA"
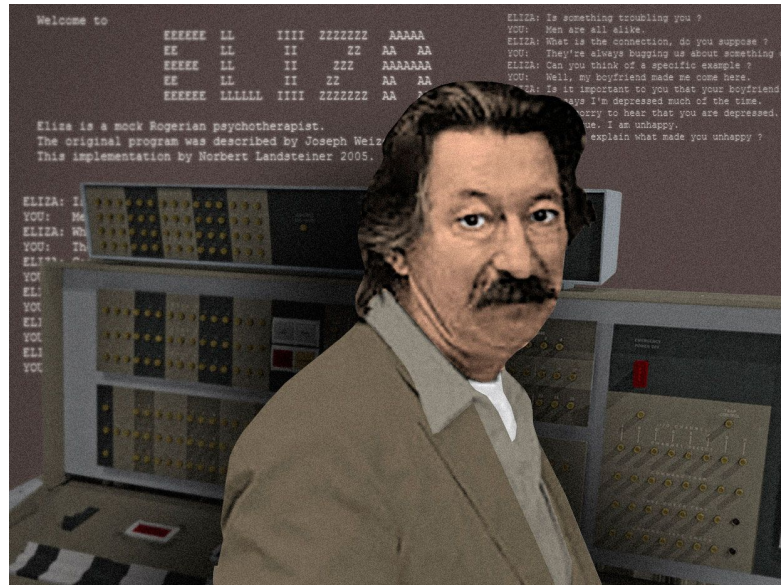
> Hello, I am Eliza.
* I am afraid.
> How long have you been afraid?
* Since midterms.
> Tell me more...
* I am afraid that I will fail my course.
> Do you enjoy being afraid that you will fail your course?

History of AI

1972 - First intelligent humanoid robot in Japan WABOT-1

       Invented by Ichiro Kato

1974 to 1980 - The AI Winter
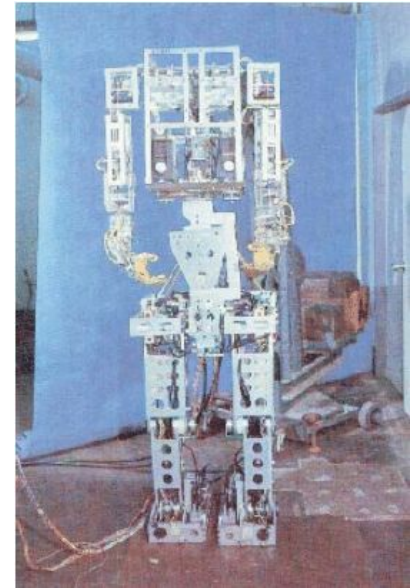
History of AI

Expert Systems

1980 - AI came back with **expert systems**, they are programmed with decision making abilities

    Applications:

        Process Control Systems (Controlling a physical process based on monitoring)

        Knowledge Domain (Finding out faults in vehicles, computers)

        Finance/ Commerce (Detection of possible fraud, suspicious transactions,

                stock market trading)

History of AI

1987 to 1993 - AI Winter

1997 - IBM Deep Blue defeated the world chess champion

History of AI

2002 - AI entered into the house in the form of Roomba, a vacuum cleaner

2006 - AI entered the business world, companies like Facebook, Twitter and

Netflix also started using AI

History of AI

2011 - IBM's Watson won jeopardy, a quiz show, where it had to solve the complex questions as well as riddles.

2012 - Google has launched an Android app feature "Google now", which was able to provide information to the user as a prediction.

2014 - Chatbot "Eugene Goostman" won a competition in the infamous "Turing test."

2016 - "Project Debater" from IBM debated on complex topics with two master debaters and also performed extremely well.

History of AI

1943 — Evolution of Artificial neurons

1950 — Turing Machine

1956 — Birth of AI: Dartmouth Conference

1966 — First Chatboat : ELIZA

1972 — First Intellgence Robot : WABOT -1

1974-1980 — First AI winer

1980 — Expert Ststem

1987-1993 — Second AI Winer

1997 — IBM Deep blue : first computer to beat a world chess champion

2002 — AI in Home: Roomba

2011 — IBM s Watson : Wins a quiz show

2012 — Google now

2014 — Chatbot Eugene Goostman:Wines a "Turing test
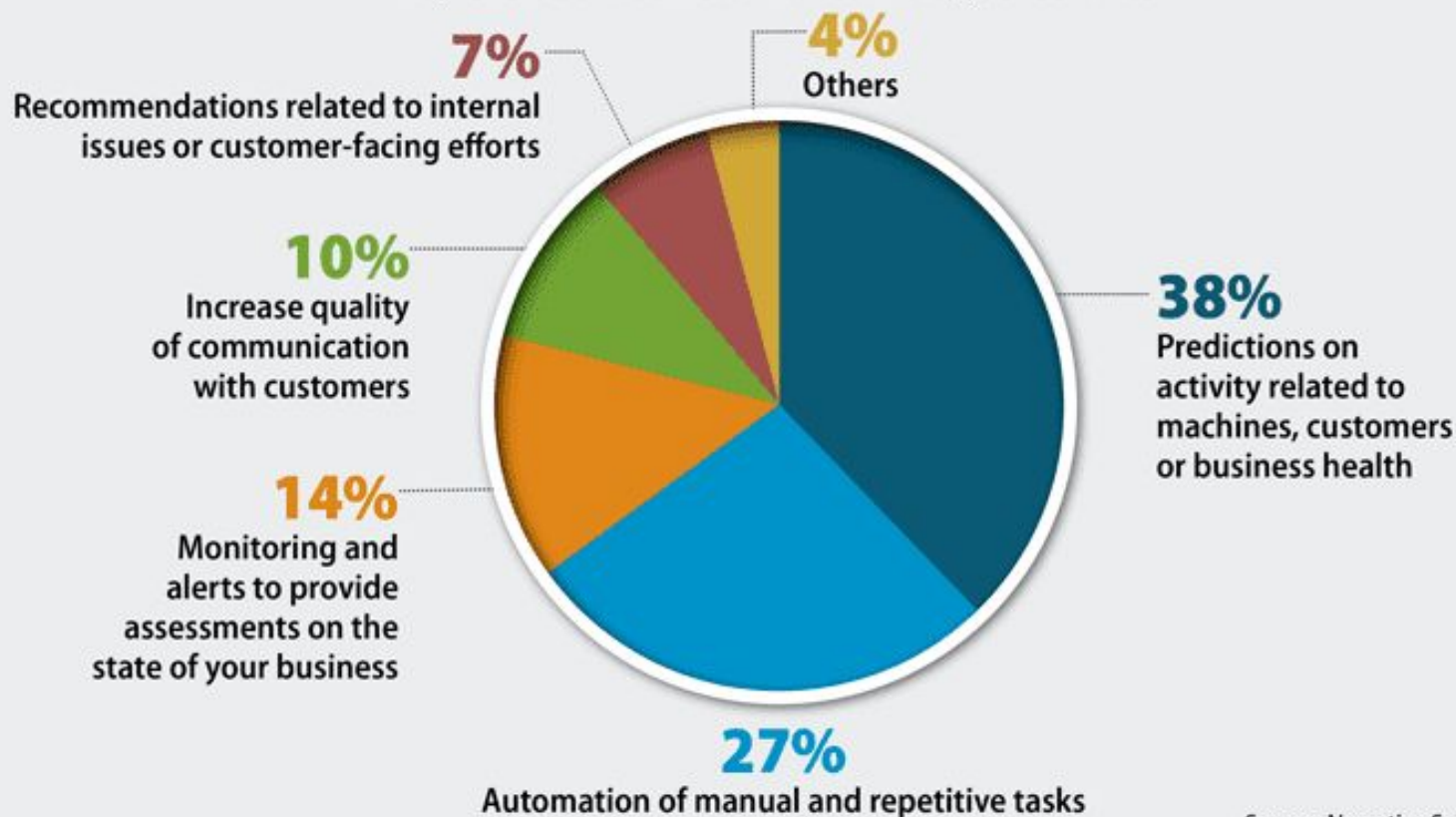
2015 — Amazon Echo

What is Machine Learning?

AI is a bigger concept to create intelligent machines that can simulate human thinking capability and behavior, whereas, machine learning is an application or subset of AI that allows machines to learn from data without being programmed explicitly.

is a type of artificial intelligence (AI) that allows software applications to become more accurate at predicting outcomes without being explicitly programmed to do so. Machine learning algorithms use historical data as input to predict new output values.

Most Important Benefit That AI Should Provide Business

Top choice of business and technology executives

7%
Recommendations related to internal issues or customer-facing efforts

4%
Others

10%
Increase quality of communication with customers

14%
Monitoring and alerts to provide assessments on the state of your business

38%
Predictions on activity related to machines, customers or business health

27%
Automation of manual and repetitive tasks

Source: Narrative Science 2016

Impacts of AI

Positive Impacts:

- Fast and accurate diagnostics
- Socially therapeutic robots
- Reduce errors related to human fatigue
- Artificial Intelligence-based surgical contribution
- Improved Radiology
- Virtual Presence

Negative Impacts:

- Less social interactions
- Decrease in manual labor

Computational Neuroscience

Normal

Mild cognitive impairment

Alzheimer's disease