



AN INTRODUCTION TO AI



Jackson Baldwin, Molly Meadows and Conner Mullins



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WHAT IS AI?

- **Artificial Intelligence**
- **“1 : a branch of computer science dealing with the simulation of intelligent behavior in computers. 2 : the capability of a machine to imitate intelligent human behavior.” - merriam-webster**
- **A computer program/object that can perform functions independently based on a system of instructions**
- **Mimicry of human intelligence**



4 TYPES OF AI

Reactive:

Programmed to provide an output based on some input. No way to learn from/of past or future actions

Ex. IBM's Deep Blue

Theory of Mind:

Behavior will adjust based on emotions, which will change as it interacts with people

(work in progress)

Limited Memory:

Learns from the past and builds experiential knowledge by observing actions or data

Ex. Chatbots

Self-Aware:

Most advanced type, are aware of their own emotions and will have both desires and needs

(conceptual)

DIFFERENT CLASSIFICATION OF TYPES OF AI

Artificial Narrow Intelligence (ANI)

- All current forms of AI
- Can only do what they are programmed to do
- Machine Learning

Artificial General Intelligence (AGI)

- Can learn, understand, perceive and function just as a human would

Artificial SuperIntelligence (ASI)

- Most capable forms of intelligence
- More capable than humans



Artificial Narrow Intelligence (ANI)



Stage-1

Machine Learning

- Specialises in one area and solves one problem



Siri



Alexa



Cortana

Artificial General Intelligence (AGI)



Stage-2

Machine Intelligence

- Refers to a computer that is as smart as a human across the board

Artificial Super Intelligence (ASI)



Stage-3

Machine Consciousness

- An intellect that is much smarter than the best human brains in practically every field



HOW DOES IT WORK?

- **AI systems combine large sets of data with processing and complex algorithms that will allow the program to learn from features or patterns to provide specific functionality**
- **Six Subsets:**
 - **Machine Learning**
 - **Deep Learning**
 - **Natural Processing Language**
 - **Robotics**
 - **Neural Networks**
 - **Genetic Algorithms**



MACHINE LEARNING VS DEEP LEARNING

Machine learning

A subset of AI

Can train on smaller data sets

Requires more human intervention to correct and learn

Shorter training and lower accuracy

Makes simple, linear correlations

Can train on a CPU (central processing unit)

Deep learning

A subset of machine learning

Requires large amounts of data

Learns on its own from environment and past mistakes

Longer training and higher accuracy

Makes non-linear, complex correlations

Needs a specialized GPU (graphics processing unit) to train

Artificial Intelligence

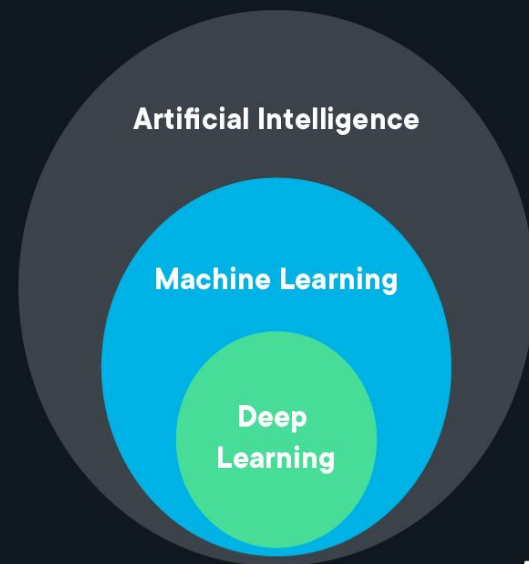
A science devoted to making machines think and act like humans.

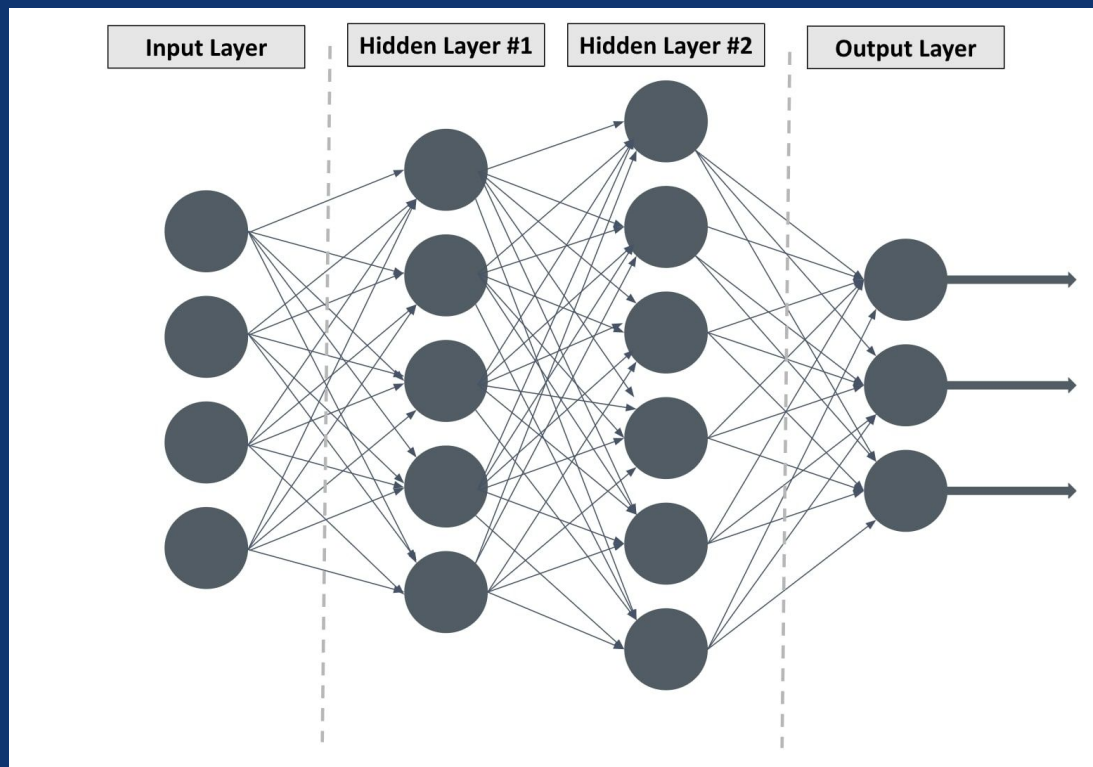
Machine Learning

Focuses on enabling computers to perform tasks without explicit programming.

Deep Learning

A subset of machine learning based on artificial neural networks.



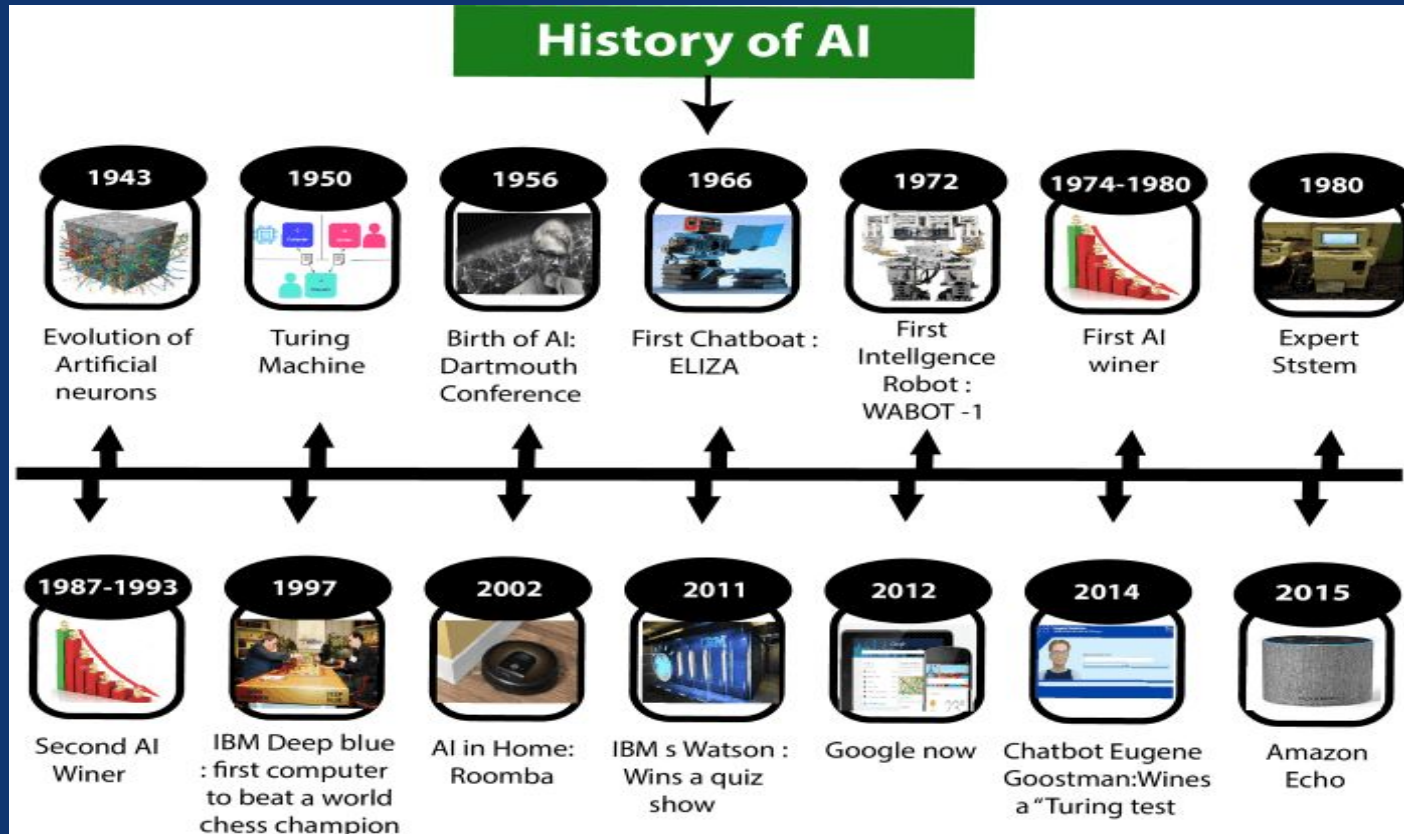


POPULAR EXAMPLES/USES

- **AI art generator**
- **Google Photo Translate**
- **Self Driving Cars**
- **Chatbots**
- **Cortana/Siri/Google Home/etc.**
- **GPS**
- **Autocorrect**
- **HealthCare Apps**
- **Agriculture Statistics**
- **Customer Support**
- **Social Media**
- **Facial Recognition (Security)**
- **E-Commerce**



TIMELINE OF IMPORTANT AI EVENTS



WHY IS AI IMPORTANT?

- More reliable and less errors
- Fast data analysis
- 24/7 access
- Many more!



HOW CAN AI BE USED UNETHICALLY

- AI search results
- The self-driving car dilemma
- Using AI art algorithms to copy and sell fakes/copyright issue?
- Recruiting algorithms could be made to exclude certain groups
- Privacy concerns
 - Golden State Killer



TYPES OF AI IN UNITY

- A* Pathfinding
- NavMesh
- Behavior Trees
- Machine Learning (ML Agents)
- State Machines
- Bolt



LIVE DEMO: A* PATHFINDING

DEMO MODES!

WHAT IS A GAME DEMO?

A game demo is a way for a company to show off core features of a video game in a short period of time

...interactable, visual, auditory

...way to experience a video game with little/no knowledge

Demos are incredibly important to improve your games visibility to a market and improve sales rate.

...get people interested in the game before the full release



3 TYPES OF GAME DEMOS

Overview Demo

...made in the initial stages of development. It shows all the features of your game design and gives an overviewing explanation of your game...a “guidebook” to the game and its rules

...great for early development projects and incremental updates, not fantastic for showing off how the final product will end up

Live Demo

Trial Version Demo

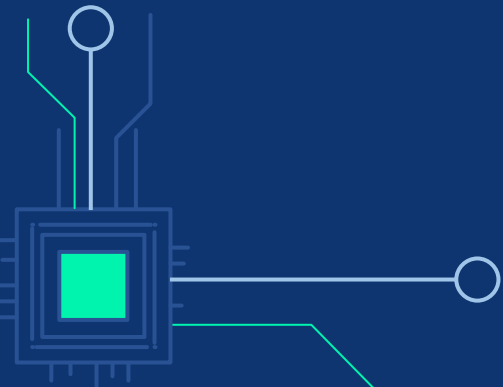
...small-scale, fully playable version of the video game.

...most interactive way to show off a product and usually receives the most attention from potential buyers, but is only possible if game is developed enough to allow for it.





LIVE DEMO



AI IN MUSIC (OPTIONAL SLIDE)

Max

...visual programming language for music and multimedia

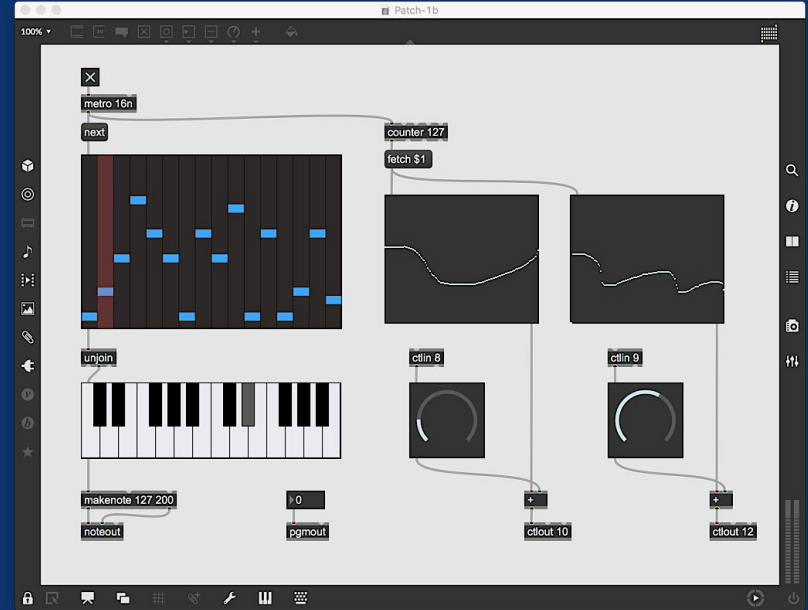
...utilizes randomizers, visualizers, and modular synthesizers

<https://youtu.be/08uCNNtuoN8>

...AudioLab visualizer

https://www.youtube.com/watch?v=84_6gla1n6c

...audio-reactive particles



UPCOMING DEADLINES

November 3rd: Team Lead 5 Update

November 8th: Team Lead 6 Presentation

November 10th: Team Lead 6 Update

November 15th - 17th: Oral Exams

November 29th: Team Lead 1 Update

December 1st: Ethics Exam

December 6th: Post Mortem

December 8th: Final Demo



OTHER EXAMPLES

First computer to sing: Daisy Bell <https://www.youtube.com/watch?v=41U78QP8nBk>

Unethical and helpful uses in detective units: <https://youtu.be/KrN2g-2LN7I>

Sofia: First Humanoid Robot



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