Natural Language Processing using Artificial Intelligence

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History of Artificial Intelligence

1950
- Alan Turing introduces the Turing Test to measure a machine's ability to exhibit intelligent behavior.

1956: The Dartmouth Conference, organized by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon, is held. This event marks the official founding of AI as an academic discipline.

1957: Frank Rosenblatt creates the perceptron, an early neural network model designed to recognize patterns.

1966: Joseph Weizenbaum develops ELIZA, an early natural language processing computer program designed to simulate a conversation with a human.

1997: IBM's Deep Blue defeats world chess champion Garry Kasparov.

History of Artificial Intelligence

2005: **Stanford's Stanley wins the DARPA Grand Challenge, showcasing the potential of AI in autonomous vehicles.**

2011: IBM's Watson wins the game show Jeopardy!, demonstrating advanced natural language processing and understanding capabilities.

2015: OpenAI is founded with the goal of promoting and developing friendly AI in a way that benefits humanity.

2016: Google DeepMind's AlphaGo defeats world champion Go player Lee Sedol, showcasing the power of deep learning.

2018: GPT initial release by OpenAI.

2018:DeepMind debuted AlphaFold.

Why the Boom.. Now?

- AI Winters...

- Data – Lots and Lots of Data...

- Massive Computing Capabilities – Thanks NVIDIA!!

- So Current boom is powered by: Data + GPU's + Neural Networks

Image courtsey:gazette.com/nvidia-corp-ceo-jensen-huang-new-rtx-4090-chips-
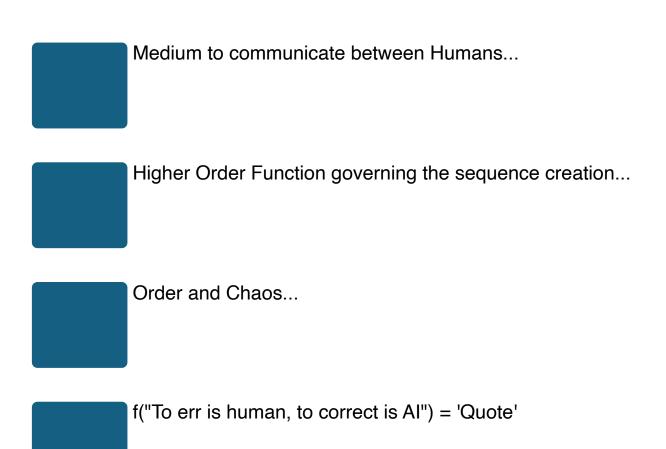
Neural Networks And How to Train Them...

- f(X) = Y

- It's an optimization problem... of ~~converting~~ transforming X to Y by clever mathematics.

Neural Networks And How to Train Them... Part II

Model (The Transforming Vector)

Data – X and Y (sometimes only X)

Optimizers – Adam

Loss functions – Cross Entropy, Mean Squared Error and so on..

Metrices – Accuracy, F1, ...

So.. Natural Language Processing...

Medium to communicate between Humans...

Higher Order Function governing the sequence creation...

Order and Chaos...

f("To err is human, to correct is AI") = 'Quote'

Named Entity Recognition

Whats an Entity:
- Name – Joshy, Place – Delhi, Organization- NIPGR
- Protein, Gene, Disease, so on...

Sequence Labelling Task
- $f(x_1, x_2, x_3, x_4) = (Y_1, Y_2, Y_3, Y_4)$

Transformers And BERT...

Enough Talk.... Lets code....