Artificial Intelligence: Handwritten Image Recognition using Neural Networks

TECHNICAL REPORT

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AGENDA

1. Introduction
2. Background
3. Methodology
4. Results
5. Discussion
6. Conclusions

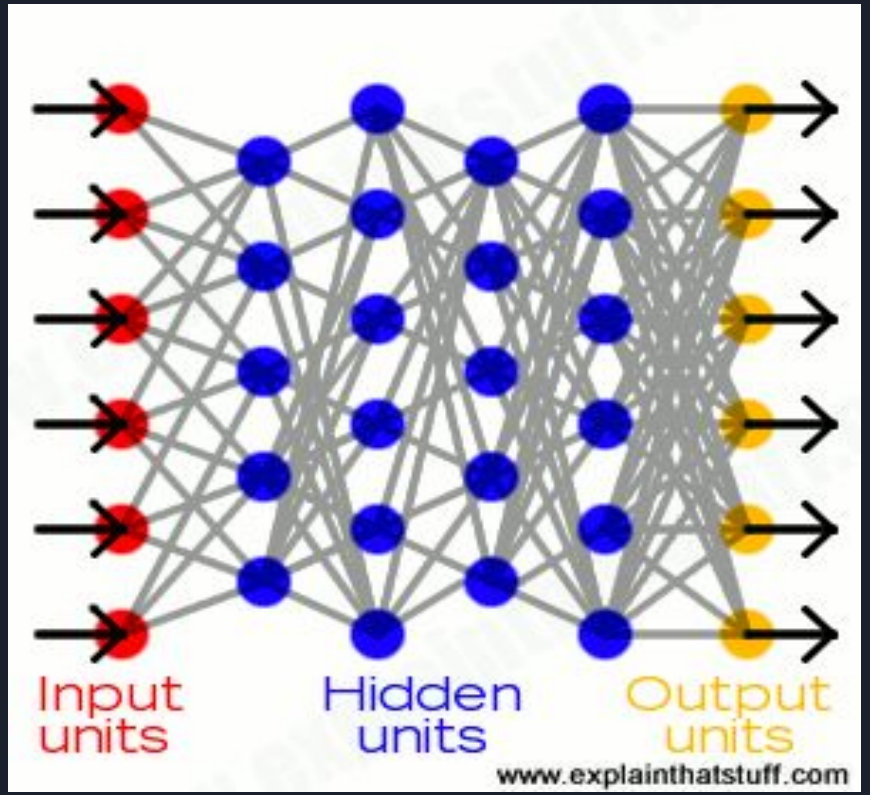
Background and Context

What is a Neural Network ?

- A software simulation created for the purpose of mimicking the human brain.
- Allows a computer to learn, recognize complex patterns, and perform humanlike decision making.

What does a Neural Network consist of ?

- A large number of artificial neurons ranging from dozens to possibly millions.
- 3 different types of neurons
- An input layer, hidden layer, and output layer.



Problem Statement

How can we use a Neural Network to teach a computer to recognize handwritten digits from an image?

What we know

- Humans can easily recognize digits just by looking at them.
- Computers and the human brain think in completely different ways.
- Computers are designed to store vast amounts of information and rearrange it in a various number of ways according to precise instructions given by the user.
- Neural Networks are highly capable of teaching concepts to computers.

What we're missing

- How to utilize a neural network for visual pattern recognition

Research Questions

- How does a neural network learn things?
- How can we implement a neural network into a program?
- Why are neural networks hard to train?
- Are there limits to what a computer can learn from a neural network ?

Relevance and Importance of the Research

Neural networks are becoming much more important in technological advancement today.

This research will help improve the understanding of neural networks and their potential to teach a computer concepts.

Potentially opening the door for many real-life problems to be easily solvable by implementing neural networks, such as :

- Credit card and Medicare fraud detection
- Ecosystem evaluation
- Medical and disease diagnosis.

THANK YOU