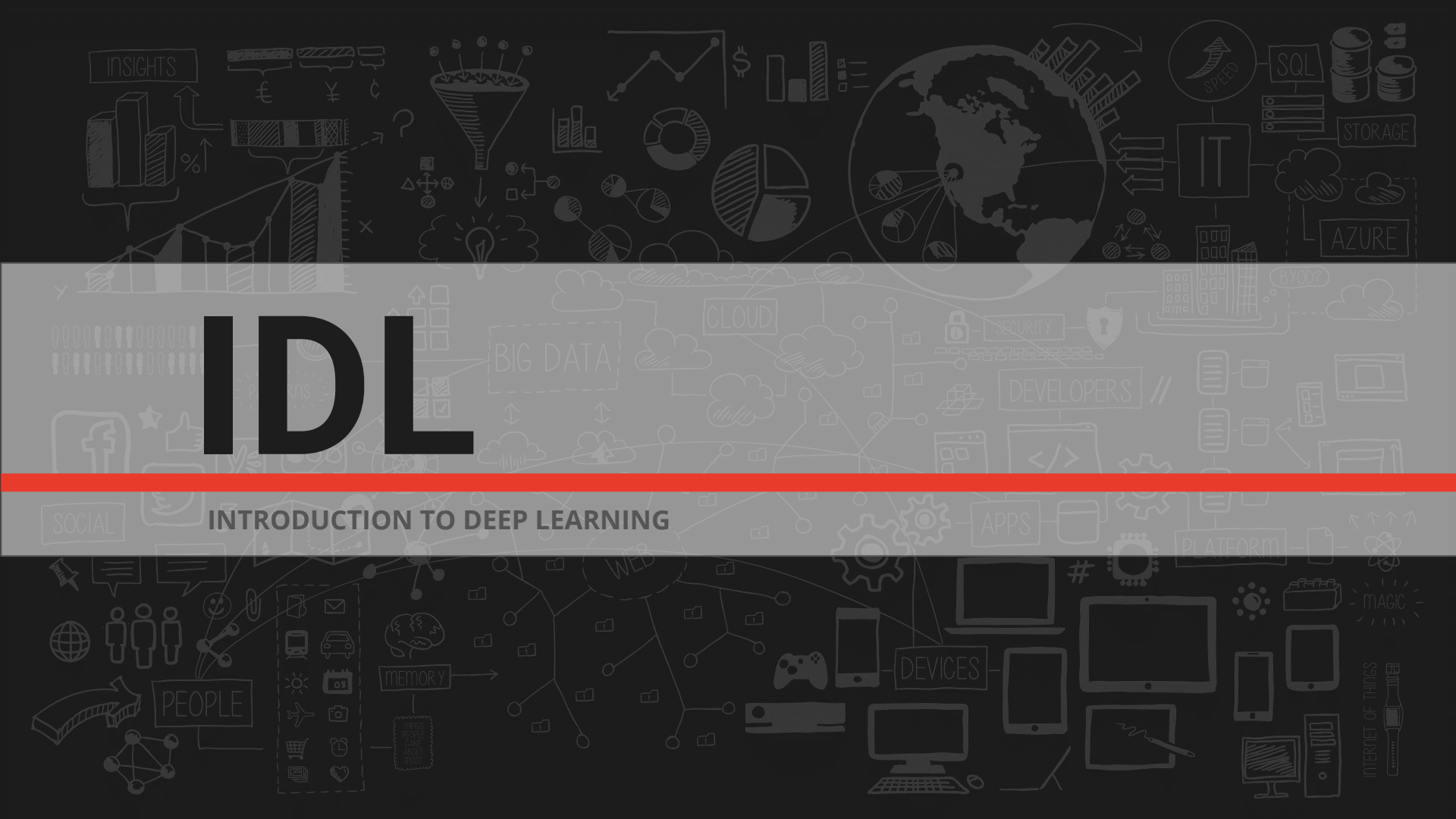


IDL

INTRODUCTION TO DEEP LEARNING

Overview

- Kickstart Deep learning understanding
- Be able to build, train and apply fully connected deep neural networks
- Mathematical Understanding
- Dealing with data and datasets
- Understand the key parameters in a neural network architecture

Bharath

Shakeel

Snigdha

Irfan

Sahal

Ayisha

Ajay

Santosh

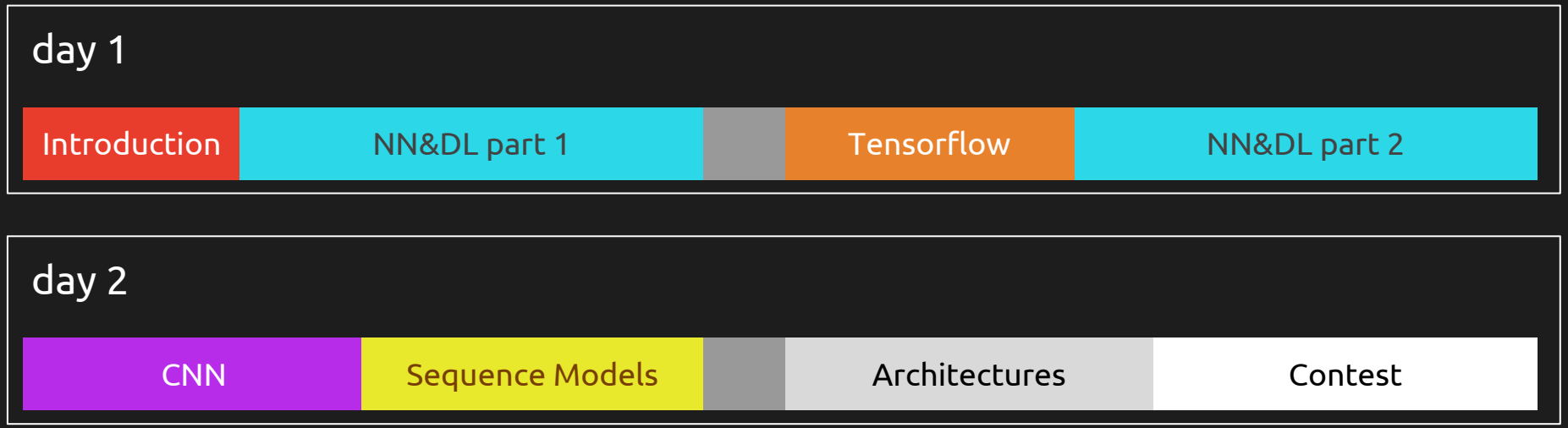
Format and Information

ANACONDA

TensorFlow

What to expect ?

Timeline


day 1
Introduction
NN&DL part 1
Tensorflow
NN&DL part 2
day 2
CNN
Sequence Models
Architectures
Contest

Introduction to Introduction

Intelligence

- Perceive & Infer Information
- Retain as Knowledge
- Apply in Environment or context

$$\Upsilon(\pi) := \sum_{\mu \in E} 2^{-K(\mu)} V_\mu^\pi .$$

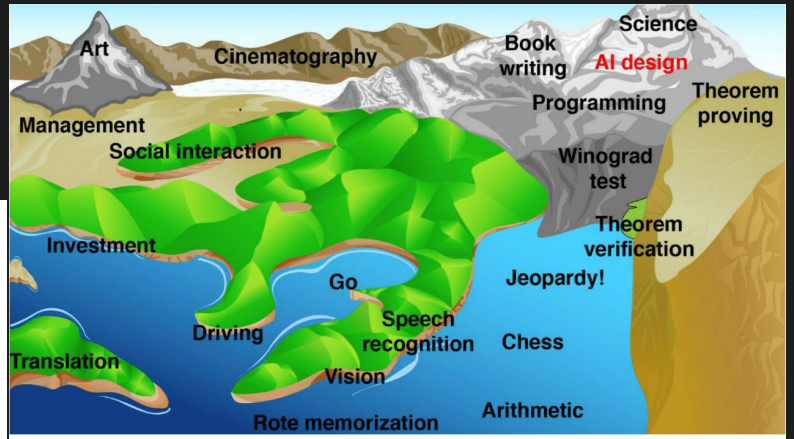
Measure of Intelligence

Complexity penalty

Value achieved

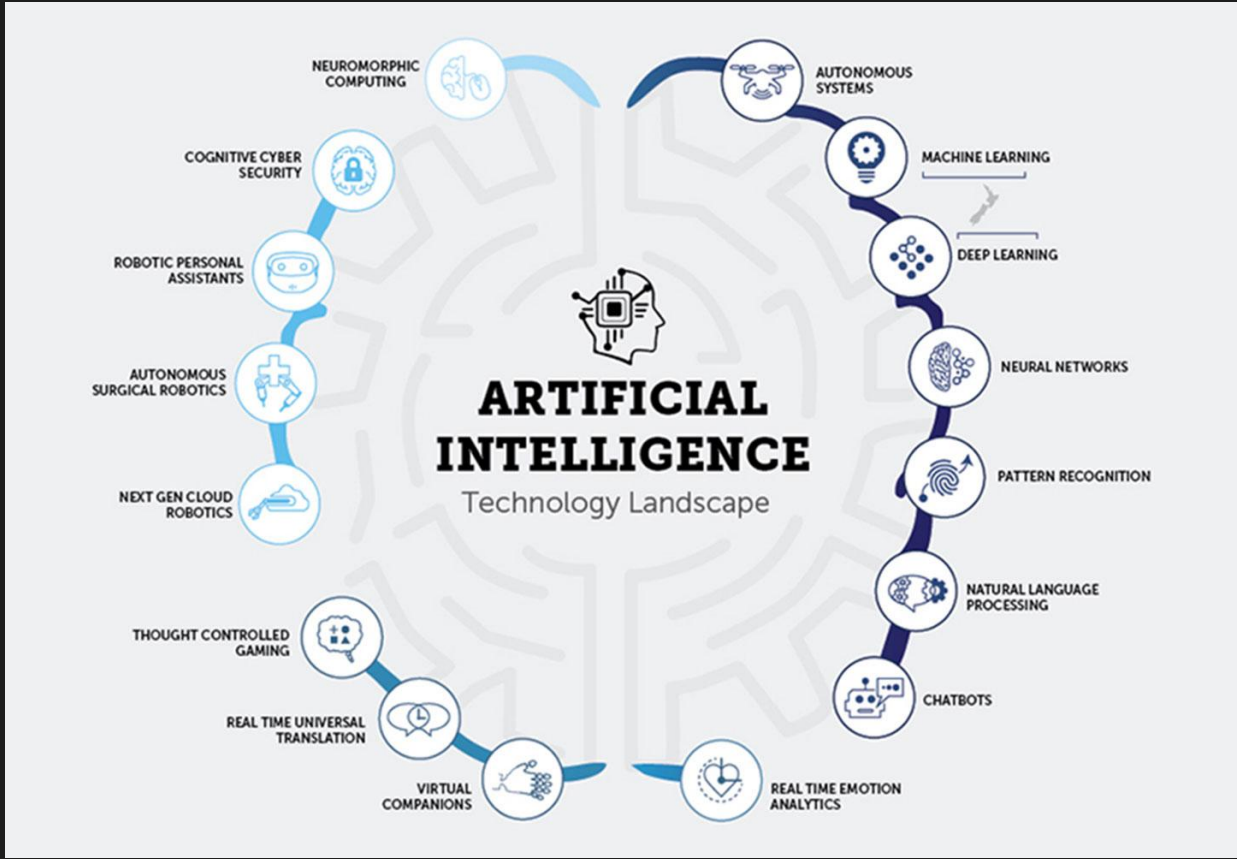
Sum over environments

Universal Intelligence: A Definition of Machine Intelligence, Legg & Hutter 2007

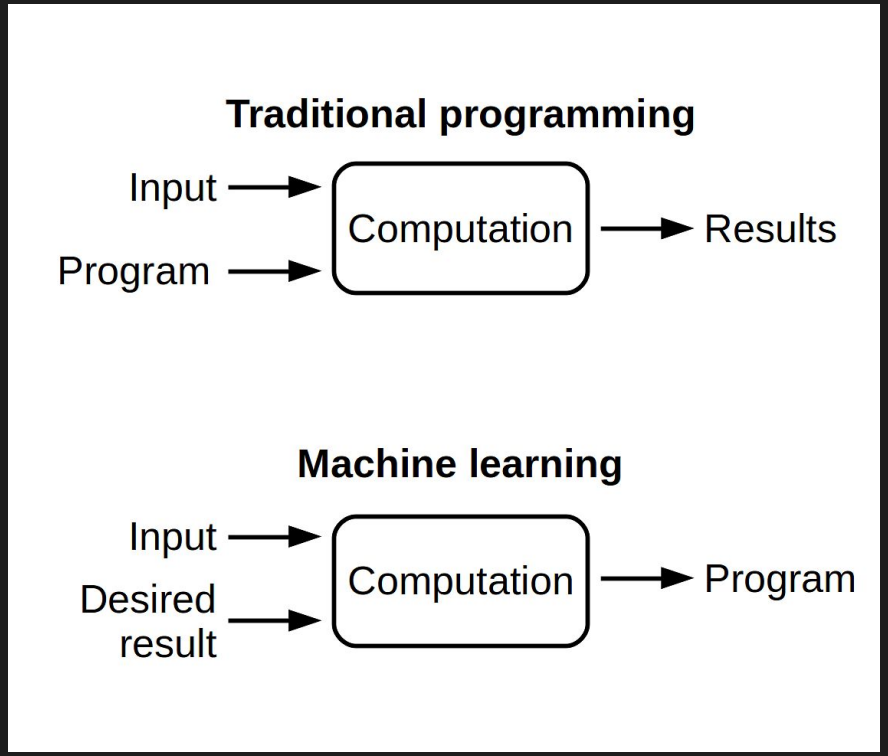


Max Tegmark's rising sea visualization of
Hans Moravec's landscape of human competence

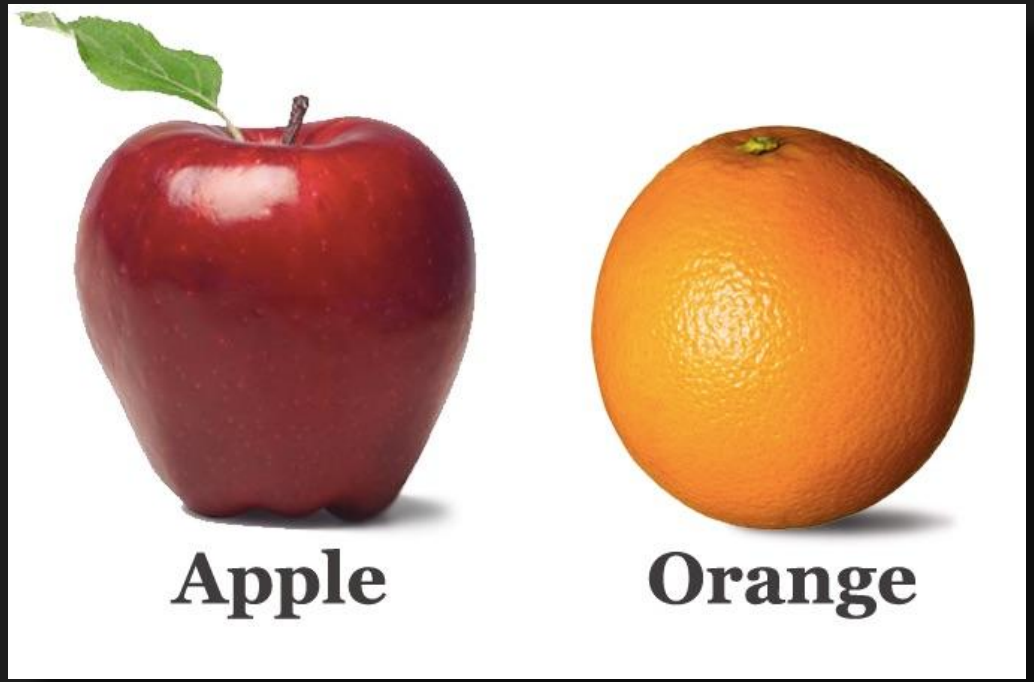
Artificial Intelligence



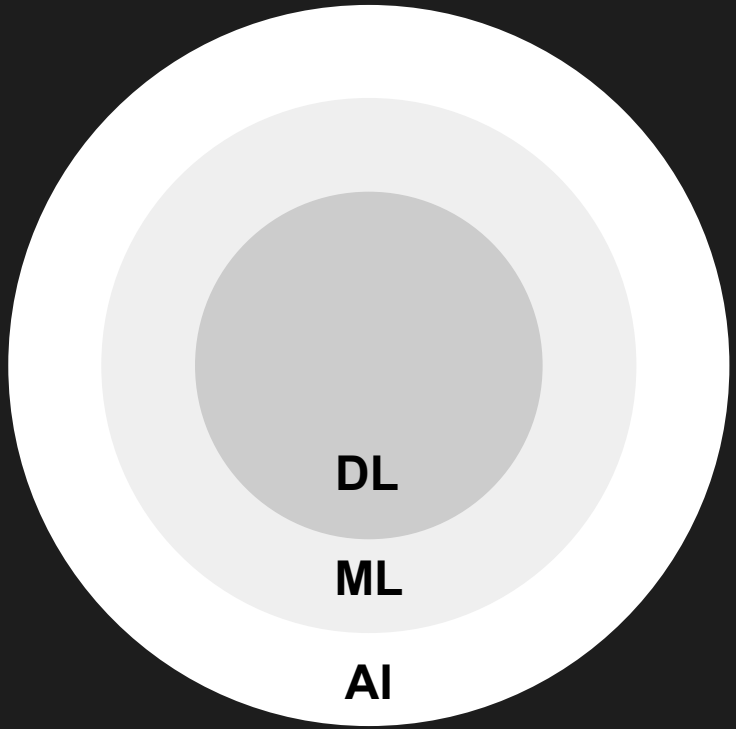
Machine Learning



Machine Learning



Deep Learning

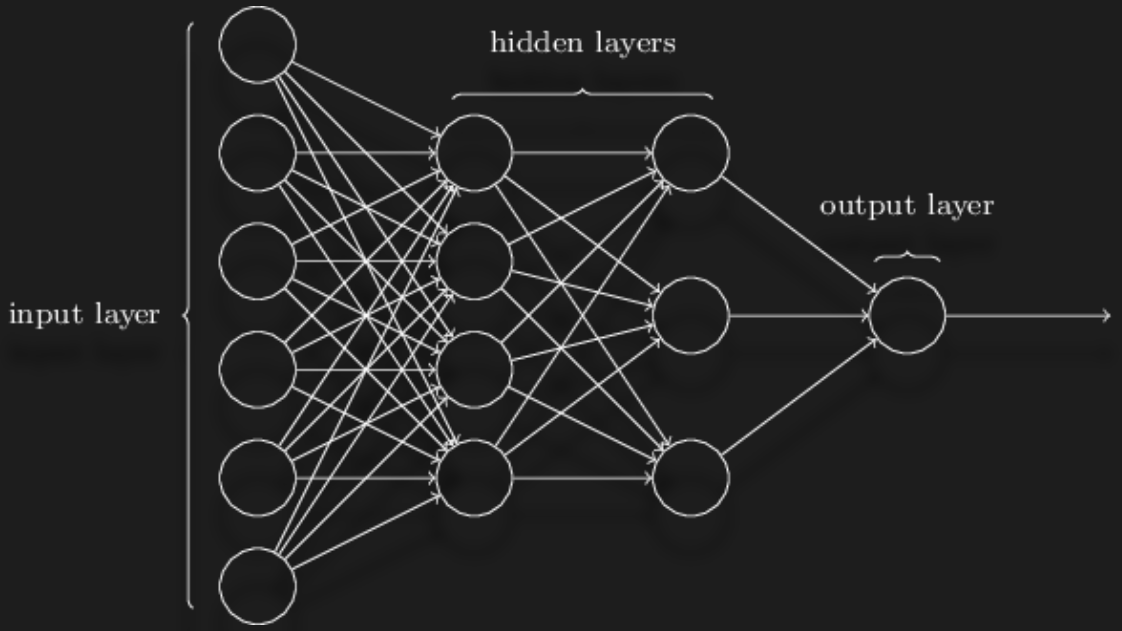


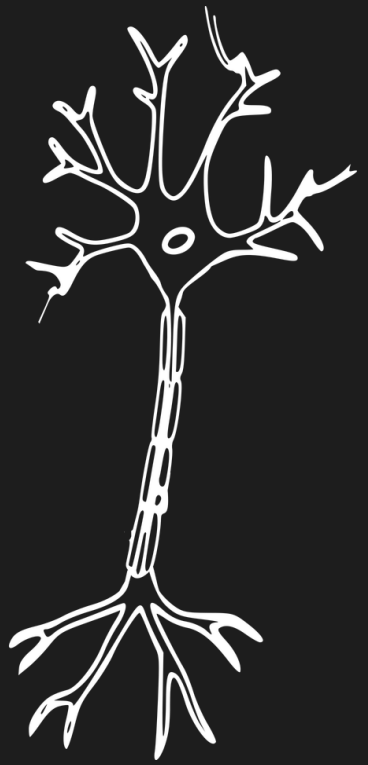
AI: Intelligence mimicked by computers or machines.

ML: Subset of AI which uses statistical methods to learn and solve problem without explicit programming.

DL: Subset of ML which uses multilayer neural network

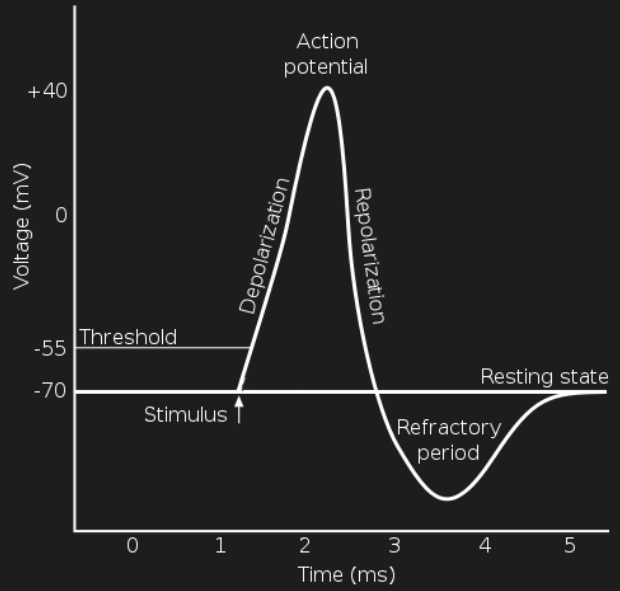
Neural Network

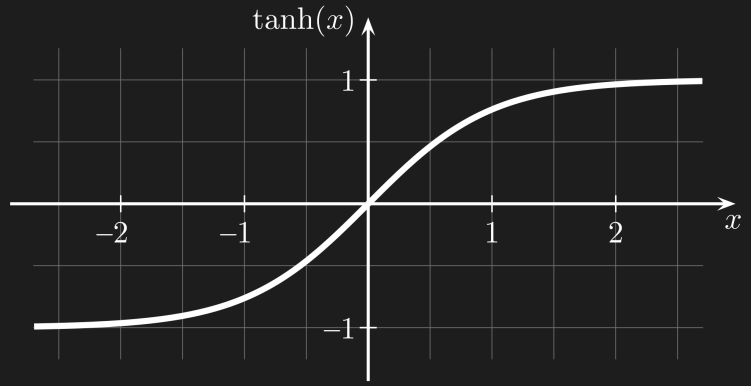




Neural Network

Neural Network





The why ?

- Can be applied to images, text, audio, video…
- Enables End-To-End Training
  - Optimise for the end loss
  - Don’t engineer your inputs
  - Learn good representations
- Easily transferable and modular.
- Now computationally feasible at scale (GPUs)

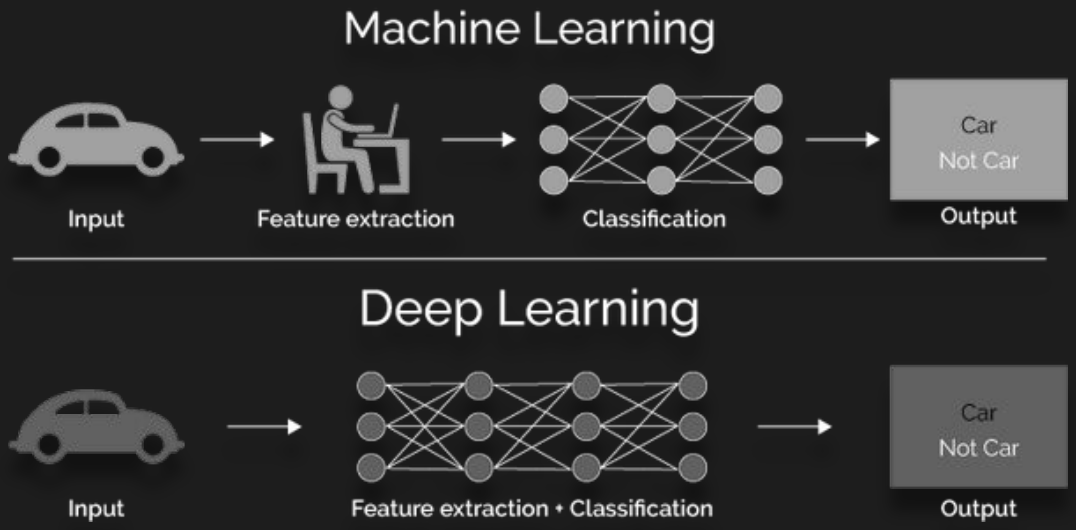
Deep Learning

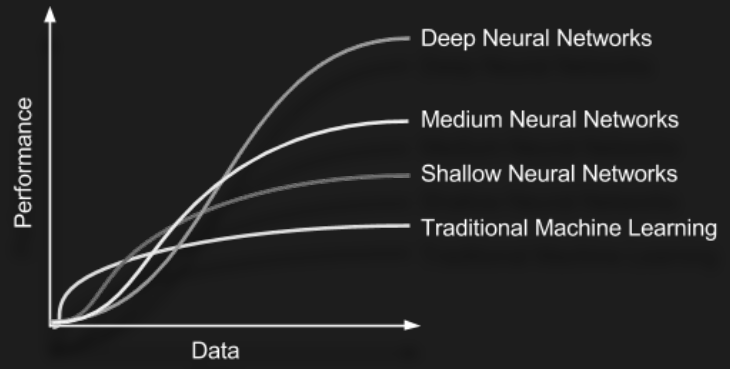
- **What is it**:Extract useful patterns from data.
- **How**:Neural network + optimization
- **How (Practical)**:Python + TensorFlow
- **Hard Part**:Good Questions + Good Data
- **Why now**:Data, hardware, community, tools, investment
- **Where do we stand?** Most big questions of intelligence have not been answered nor properly formulated

Exciting progress:

- Face recognition
- Image classification
- Speech recognition
- Text-to-speech generation
- Handwriting transcription
- Machine translation
- Medical diagnosis
- Digital assistants
- Ads, social recommendations
- Game playing with deep RL

Deep Learning





NEURAL NETWORK