Google Developers

# Gentle Introduction to Machine Learning Workshop

**Bao-Dai**
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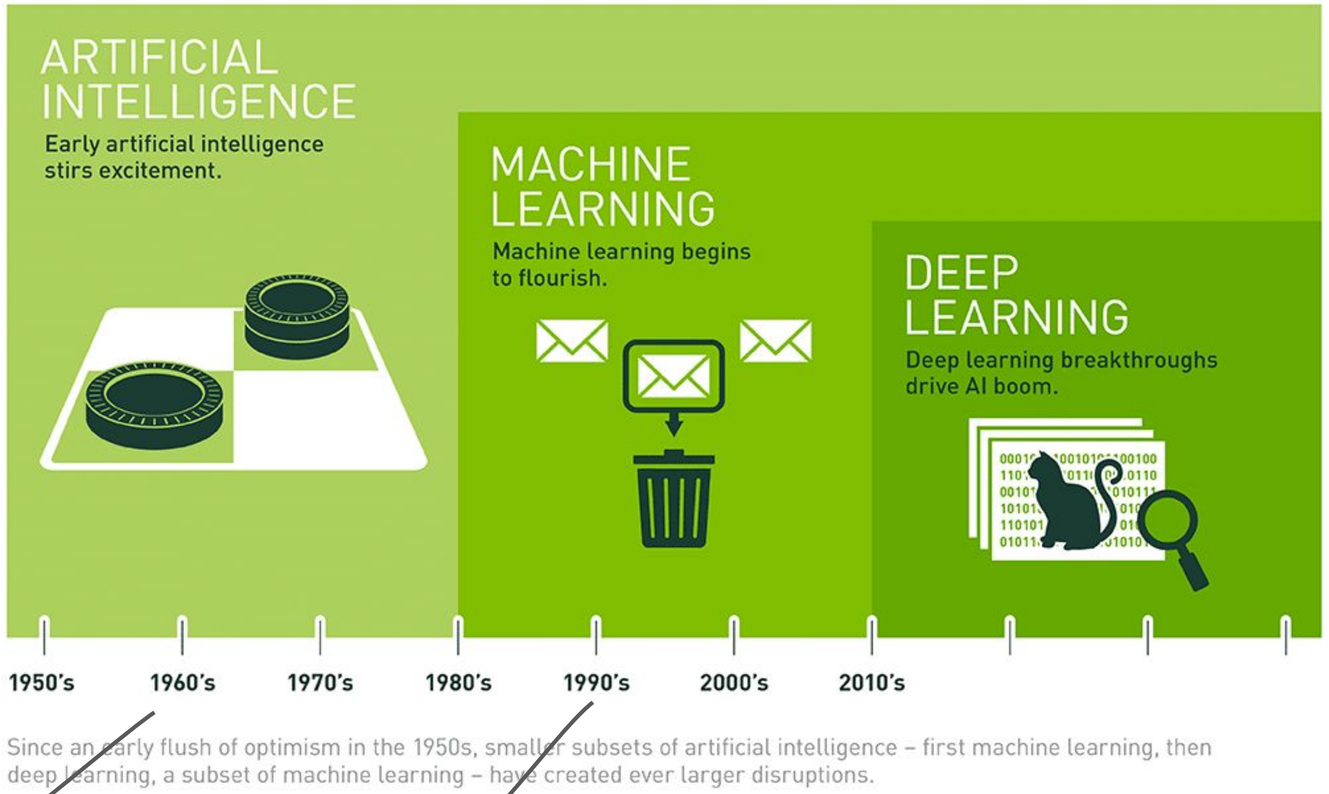
ML Research scientist

# Let’s define the terms

Artificial Intelligence (AI)
Machine Learning (ML)
Deep Learning (DL)




Since an early flush of optimism in the 1950s, smaller subsets of artificial intelligence – first machine learning, then deep learning, a subset of machine learning – have created ever larger disruptions.

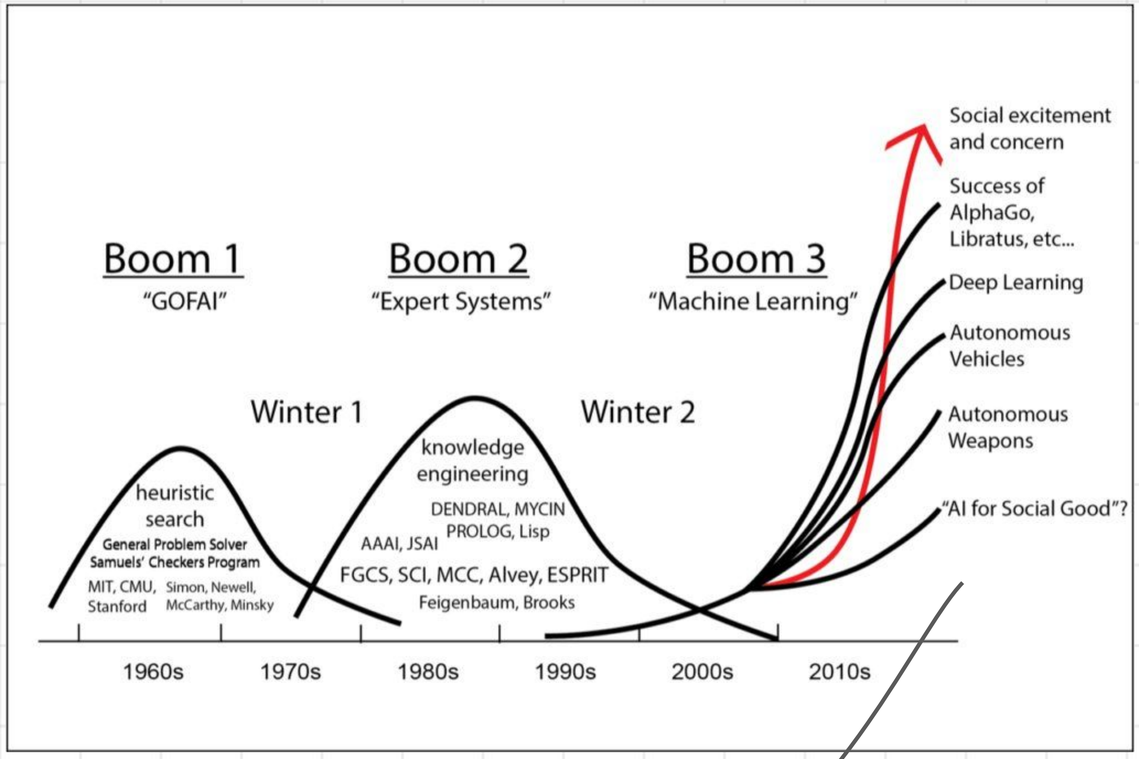
Why don’t we have Deep Learning right here?

Experts

# The AI winters

- 1973: disappointments in machine translation field and Lighthill report

- 1988: limitations of expert systems and conclusion from DARPA ISTO




## Why has Machine Learning been so successful in 2010s 🤨?

> "… very limited success in particular areas, followed immediately by failure to reach the broader goal at which these initial successes seem at first to hint…".

Experts

# Data and computational resource advancement

… and approaches to run methods

- Computers are stronger and cheaper than themselves in the past
- From that, data become abundant, which helps facilitate training models
- Available good computational approaches 🤟

Fancy things we have today😘

Experts

# What to expect from today's workshop

- **Basics** about AI/ML/DL

Deep Learning at a *Quick* Glance [theoretical]

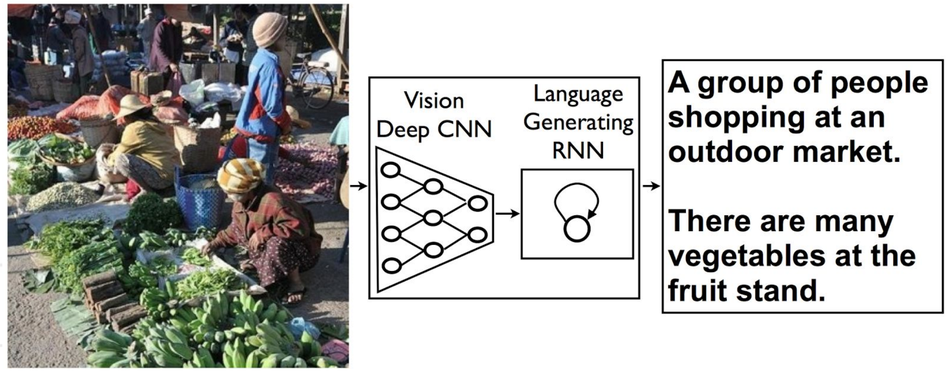
Introduction to Deep Learning [practical]

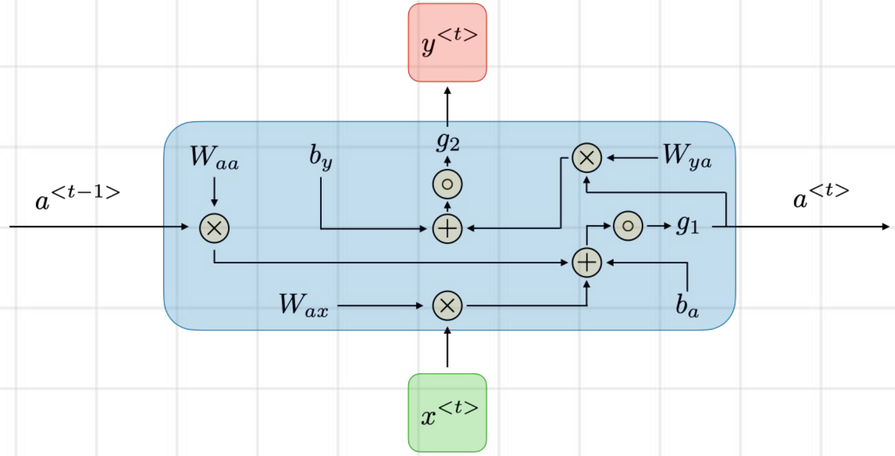
- **Super advanced** topics on CV and NLP

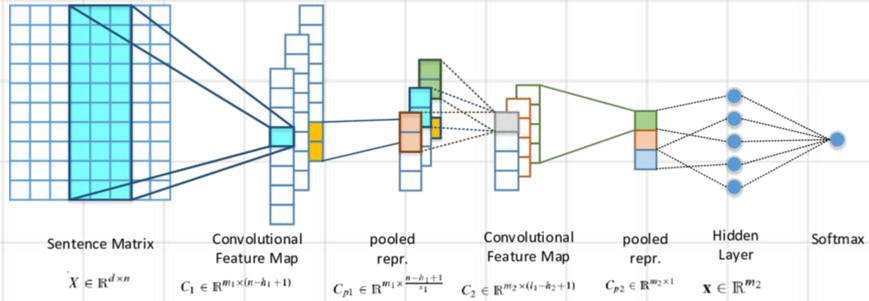
Open-Domain Question Answering

Image Captioning using Deep Learning techniques

Experts



# Our workshop on the current “AI map”

Applied math
+ Linear algebra
+ Calculus
+ Statistics

Programming

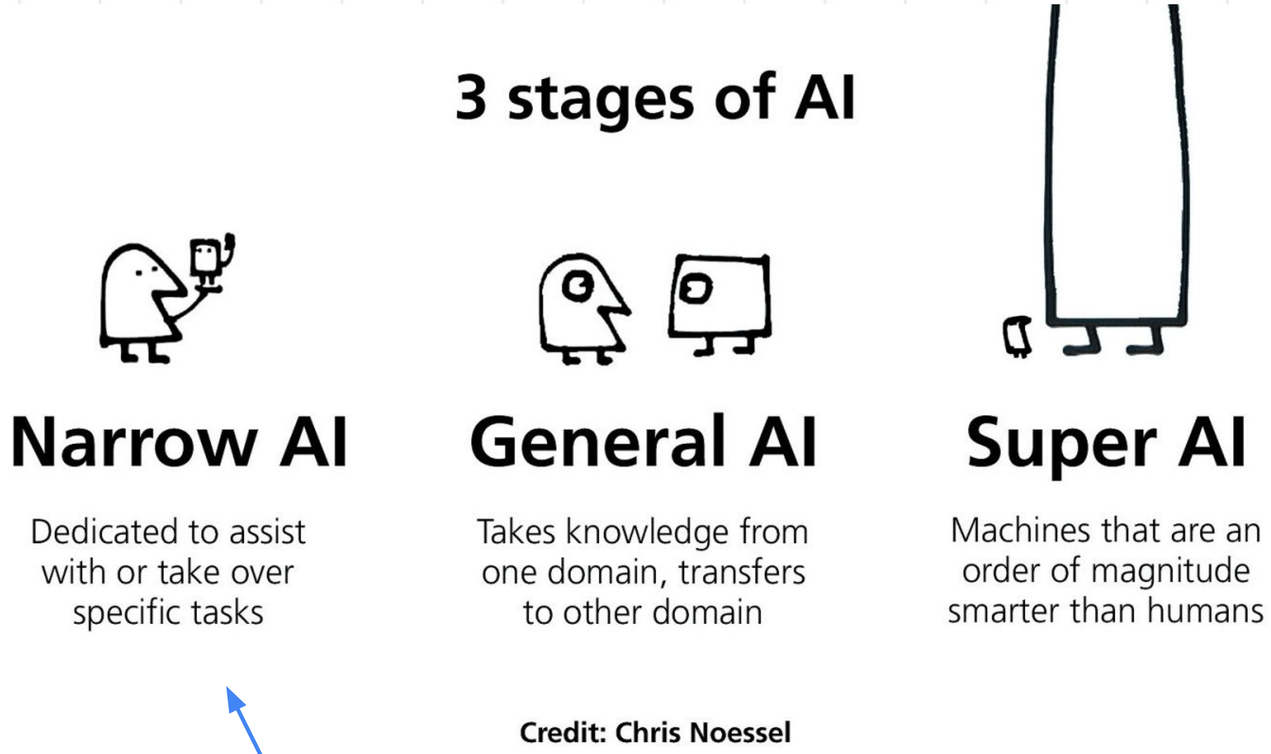
Machine Learning Basics

Feedforward Neural Network

- Sound Signal Processing
- Natural Language Processing
  - Tokenization
  - POS Tagging
  - Text classification
  - …
  - Word sense disambiguation
  - Machine Translation
  - Question answering
- Computer Vision
  - Image classification
  - Object detection
  - Face detection/recognition
  - Image reconstruction/colorization
  - Deepfake
  - Image captioning
  - …
- Music Information retrieval
- …

Experts

# What AI can and cannot do 🤔 (at this moment)




We are here!

## What AI can do

- Simple task with lots of data available
- Simple task with little data available
- Input and output are comprehensively defined

Experts

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# So... still wanna stay?😜

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