

Artificial Intelligence 101

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About myself



I am a Ph.D. candidate studying in Electrical and Computer Engineering at Purdue University. Before coming to the U.S., I obtained my B.S. degree from Electrical and Electronics Department at Fudan University in June 2016. My current research interests include computer vision, image processing and machine learning. I will join Facebook as a research scientist after graduation.

Outline



What is Artificial Intelligence?



What are the sub-disciplines?



What skills should we have?



How about the career path?



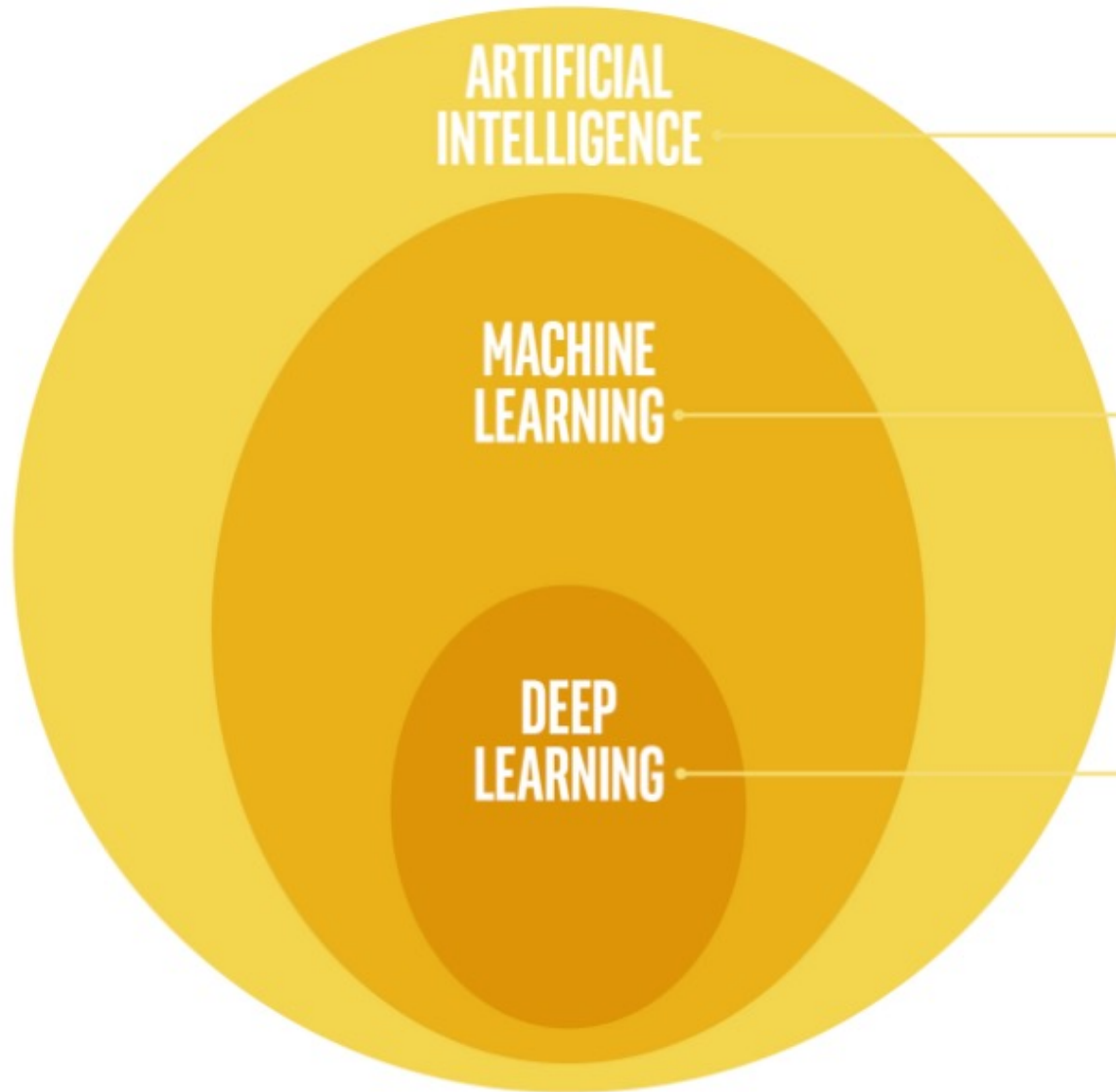
Q&A



45min



15min



ARTIFICIAL
INTELLIGENCE

- **AI** is an umbrella term for machines capable of perception, logic, and learning.

MACHINE
LEARNING

- **Machine learning** employs algorithms that learn from data to make predictions or decisions, and whose performance improves when exposed to more data over time.

DEEP
LEARNING

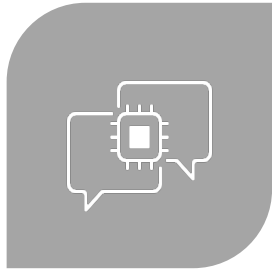
- **Deep learning** uses many-layered neural networks to build algorithms that find the best way to perform tasks on their own, based on vast sets of data.

How about autonomous driving? Face recognition? AI in health care? ...

Popular sub-disciplines



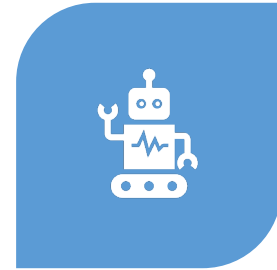
MACHINE LEARNING
(CS, MA, STAT)



NATURAL LANGUAGE PROCESSING
(CS, MA)



COMPUTER VISION
(CS, ECE, ME)



ROBOTICS
(CS, ECE, ME)

What skills should we have?

- Solid mathematical background
 - Linear Algebra
 - Statistics and Probability
- Fluent in programming
 - Python (most popular) / R / MATLAB
- Know some ml packages/deep learning frameworks
 - NLTK/pandas/Scikit-Learn
 - Pytorch/Tensorflow/Keras



TensorFlow



PYTORCH



Terminology

Supervised Learning / Unsupervised Learning/ Semi-supervised Learning/ Weakly-supervised learning

Training/Validation/Testing

Modeling/Inference/Evaluation

Features/Embeddings/Vectors

Metrics : Accuracy/Precision/Recall

True Positive/False Positive/True Negative/False Negative

Jobs for AI

- General SWE/SDE
- Machine Learning Engineer
- Data Scientist/Data Analytics
- Research Scientist
- Others:
 - Perception Engineer
 - Control Planning Engineer
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WAYMO

Autonomous Vehicle, Security Engineer

Mountain View, California, United States

Backend Engineer, Machine Learning Data Infrastructure

Mountain View, California, United States

Data Scientist

Mountain View, California, United States

Data Scientist - Weather Data

Ann Arbor, Michigan, United States; Mountain View, California, United States

Data Scientist / Software Engineer, Planner

Mountain View, California, United States

Experienced Software Engineer, Behavior Prediction

Mountain View, California, United States

Front End Tech Lead, Machine Learning Platform

Mountain View, California, United States

Frontend / Full Stack Engineer, Machine Learning Data Infrastructure

Mountain View, California, United States

Frontend Software Engineer, Simulation

Mountain View, California, United States; San Francisco, California, United States



Q&A