

L01: What is Deep Learning

CSci 560 Deep Learning w/ Python (Chollet) Ch. 1

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Summer 2025

Artificial Intelligence, Machine Learning, Deep Learning, Generative AI

- **Artificial Intelligence (AI):** *the effort to automate intellectual tasks normally performed by humans*
- **Machine Learning (ML):** *machine looks at input and answer and figures out the rules*
- **Deep Learning (DL, DNN):** *learning successive layers of increasingly meaningful representations*
- **Generative AI (GenAI):** *extend from reactive to creative activities*

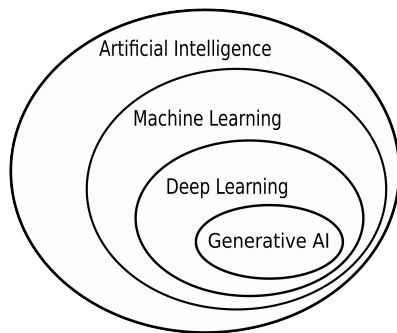


Figure 1: Relation of AI with ML, DL and GenAI. Each is a more specialized subset of the larger discipline. (Chollet, 2021, pg.2)

Machine Learning: Learning Rules and Representations from Data

- Usually have human programmer write down rules (a computer program) that turns input into appropriate answers.
- In ML paradigm, you give a ML algorithm the input and answers, and it “learns” the rules.

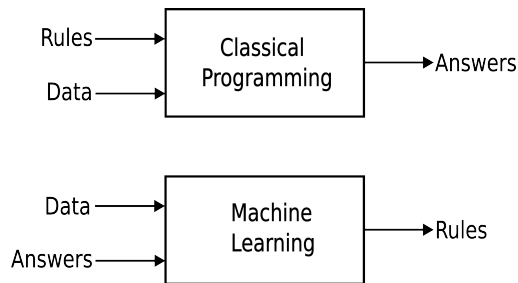
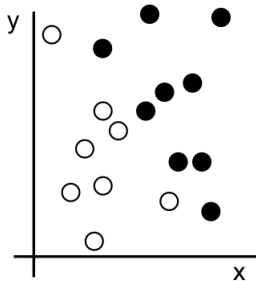


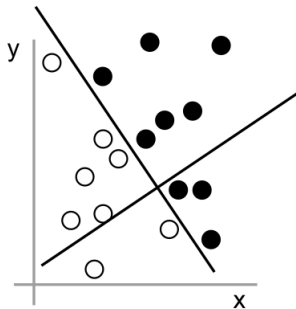
Figure 2: Machine Learning coordinage change and learning representations.. (Chollet, 2021, pg.4)

Machine Learning: Learning Rules and Representations from Data

1: Raw data



2: Coordinate change



3: Better representation

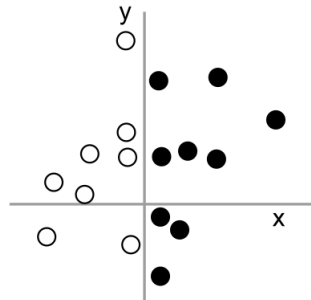


Figure 3: ML a new programming paradigm. (Chollet, 2021, Fig. 1.4)

Neural Networks and Deep Learning: The “Deep” in “Deep Learning”

Understanding how Deep Learning Works in Three Figures

AI Boom / Bust and AI Winter

The Modern Machine Learning Landscape

Why Deep Learning? Why Now?

Chollet, F. (2021). *Deep learning with python* (second). [Manning](#).