

Data Science and Deep Learning (2024)

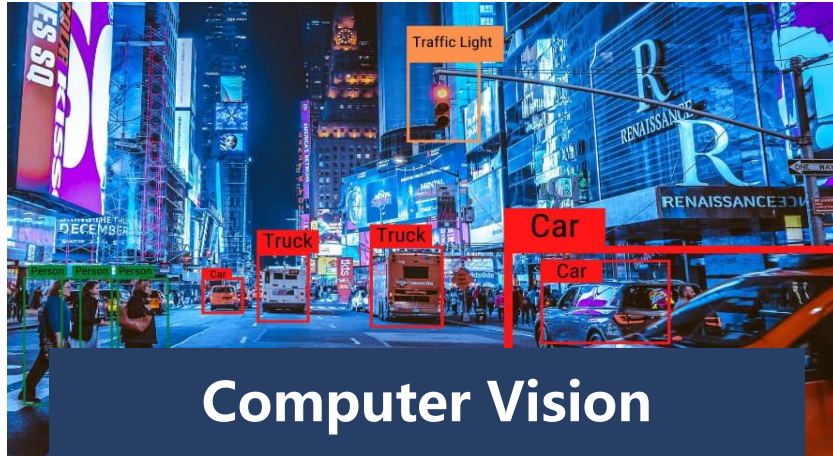
Lecture 1

Introduction to AI Modeling

Stan Z. Li



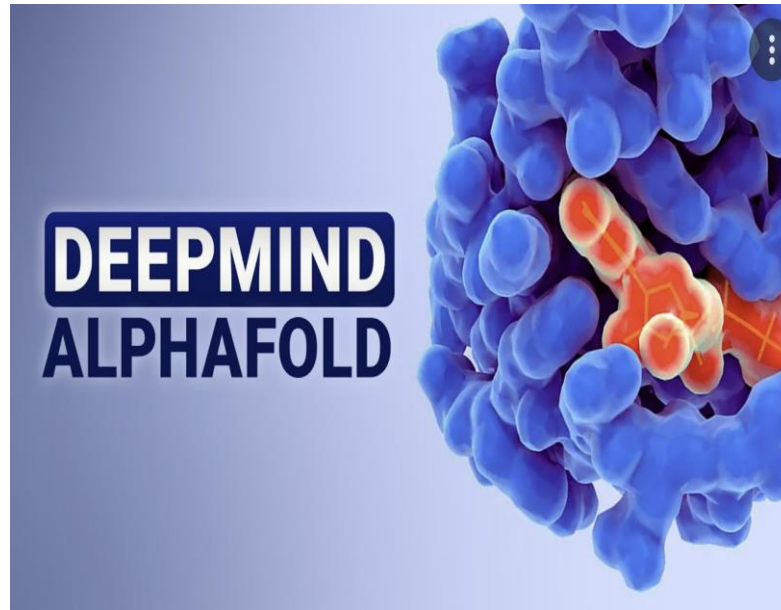
AI Research (Main-Stream Tasks)



AI for Sciences



**Optimization/
Decision Making**

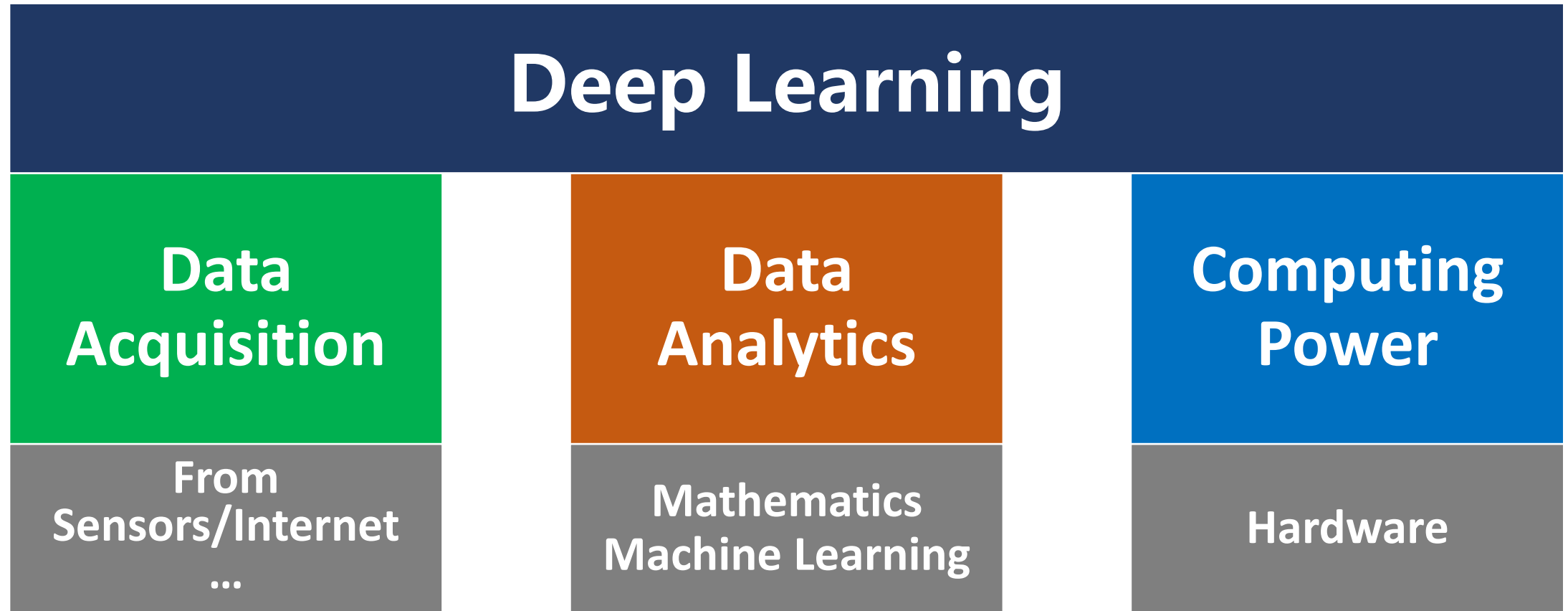


**Protein Folding
and Design**



**Drug Design
and Synthesis**

Contemporary AI and Deep Learning



AI and Machine Learning

ARTIFICIAL INTELLIGENCE

Any technique that enables computers to mimic human behavior



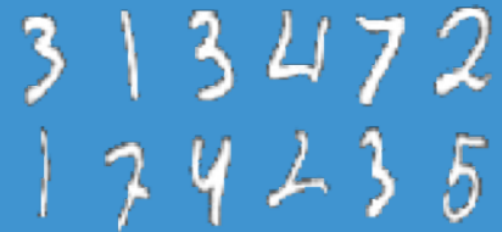
MACHINE LEARNING

Ability to learn without explicitly being programmed



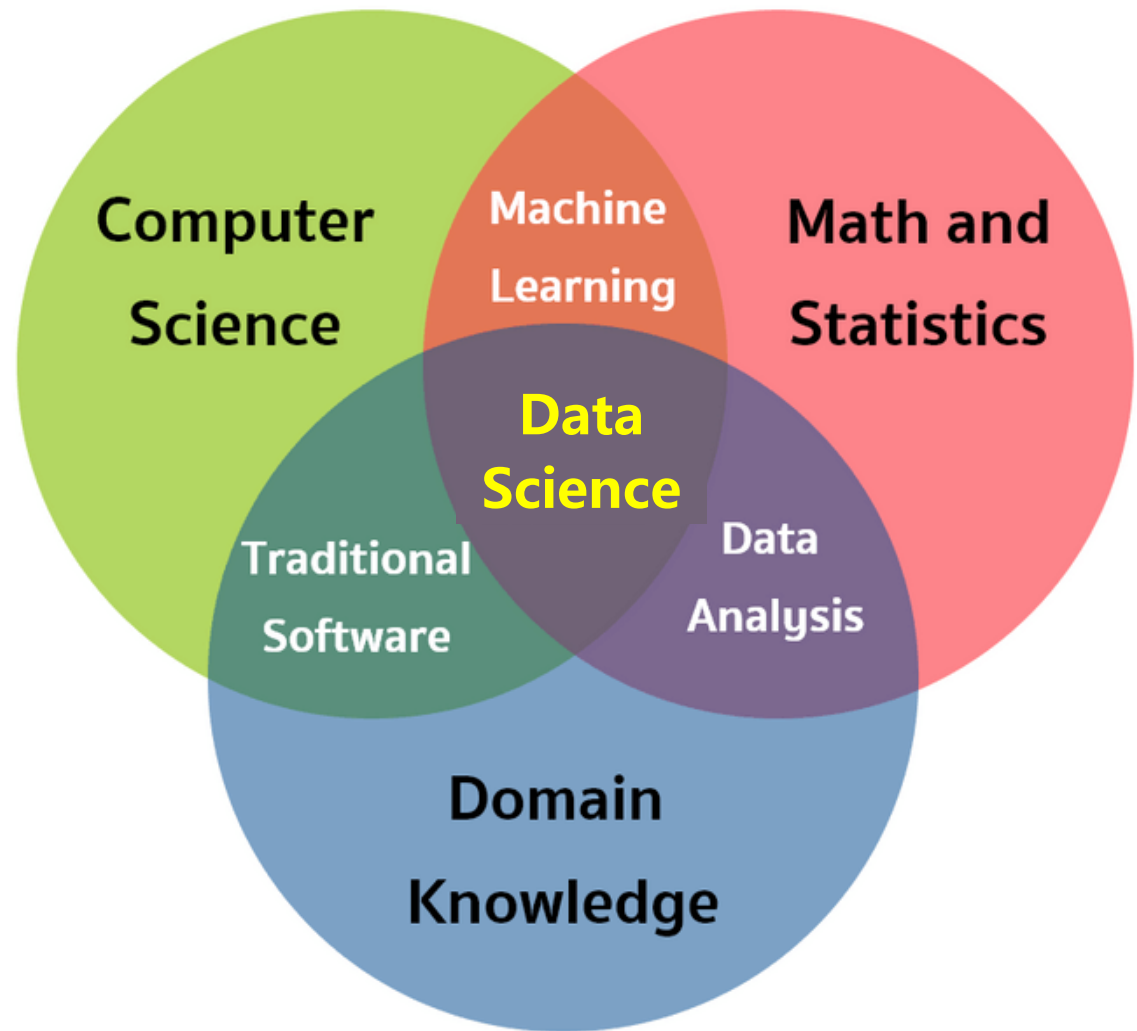
DEEP LEARNING

Extract patterns from data using neural networks

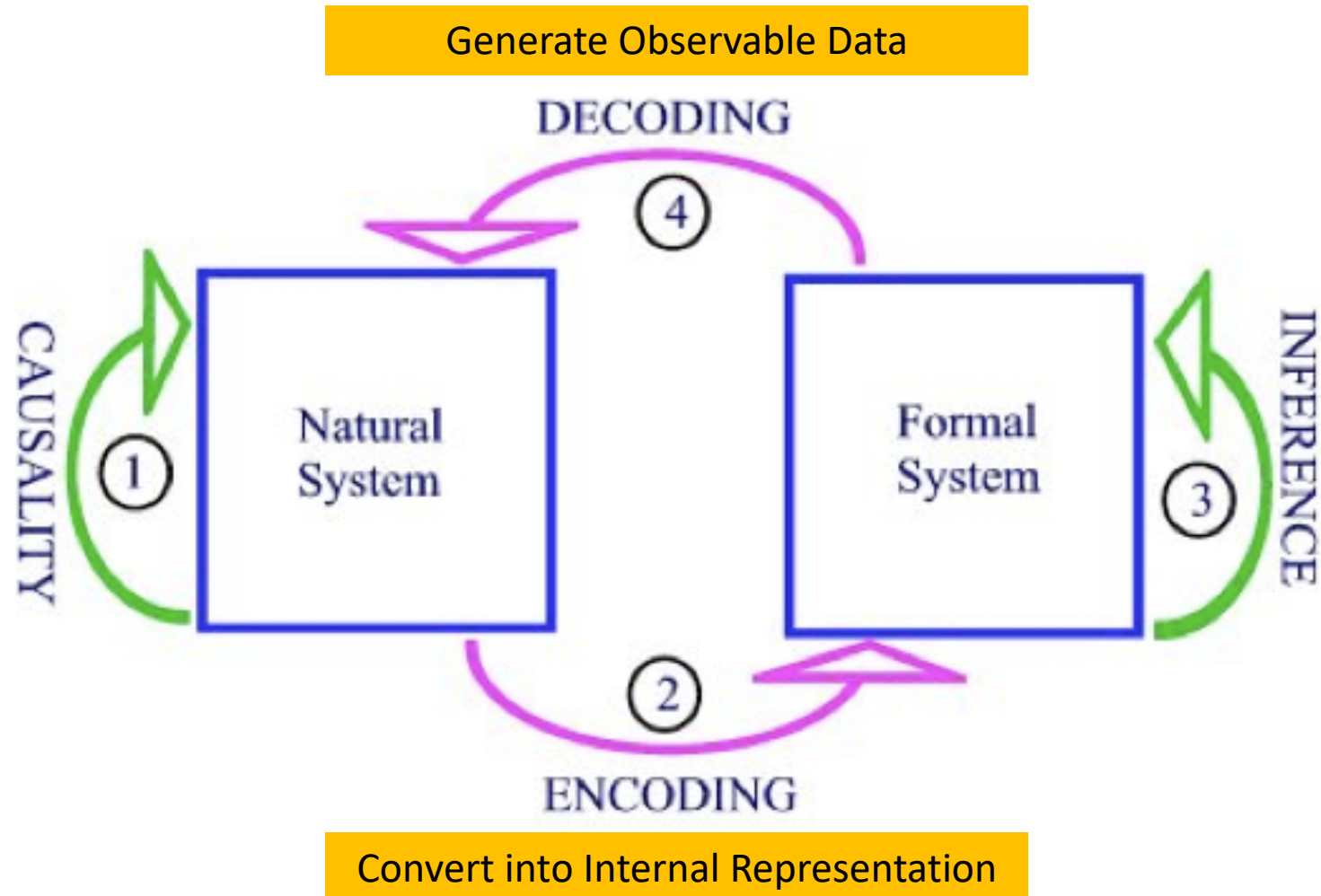


Picture Courtesy of MIT 6.S191

Data Science



Scientific Modeling



Examples of AI Modeling Problems

- Face Recognition
- Speech
- Natural Language Processing
- Robot Sensing and Control
- Whether forecasting
- Protein Computing (Structure Prediction and Sequence Design)
- Mass-spectrometric Data Analysis
- Single-Cell Clustering and Hierarchy/Lineage
- Drug Design (Large and Small Molecules)
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Thanks

