DataBite – Summer 2022

Christan Grant, Ph.D.

OU Data Lab

oudatalab.com

The University of Oklahoma

About Me

My name is Christan Grant.

I direct the OU Data Lab.

I am an Associate Professor of Computer Science at the University of Oklahoma.

I received my BS, MS, Ph.D. at the University of Florida

I was born in Miami, Florida.

My wife and I are raising a 8-, 6-, and 4-year-old.

What is Data Bite?

- A series of workshops by and for OU Students.
- We look at topics related to Data, Machine Learning, and Artificial Intelligence.
- This summer we will have 4 sessions.
- The goal is to get you interested in these topics and excited about learning more!

Data Bite Summer 2022 Schedule

Day 1

Welcome +
Intro to ML

Day 2

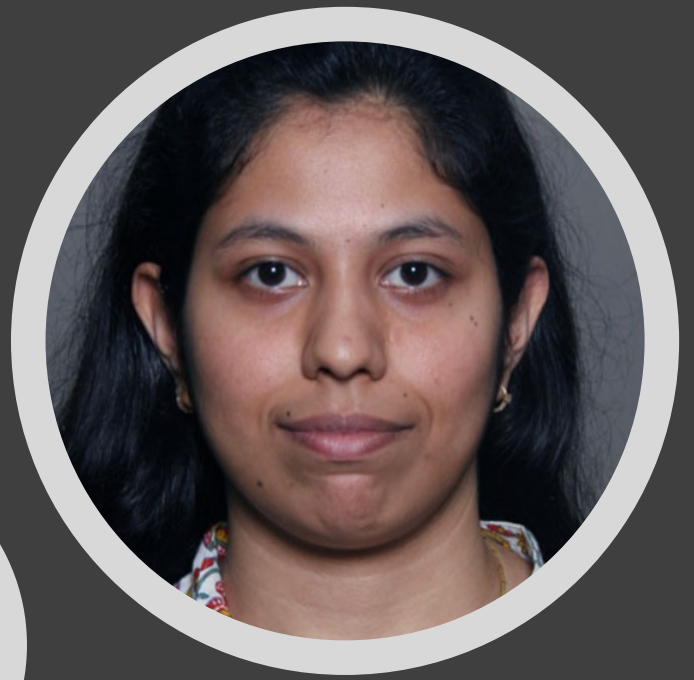
Bias and Fairness
+ Introduction to
Probability

Day 7

Classifiers and
Clustering

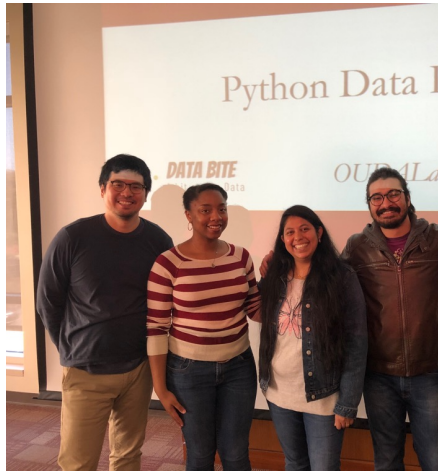
Day 4

Model Olympics



OU Data Lab Ph.D. Students


GALLOGLY COLLEGE OF ENGINEERING
SCHOOL OF COMPUTER SCIENCE
The UNIVERSITY of OKLAHOMA

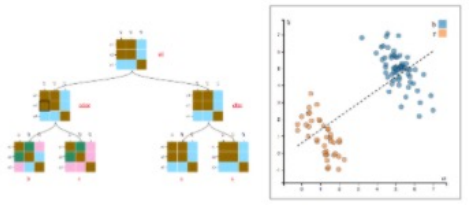

Python Data
DATA BITE

About the OU Data Lab

Fairness Forensics

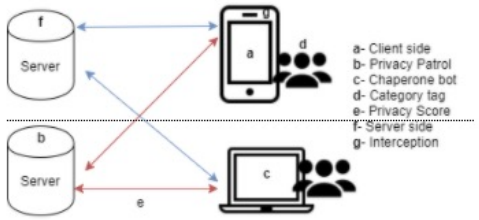
Wiggum

Investigating bias and anomalies in deployed systems.



Visual Privacy

Mitigating privacy breaching on Social Media.



Smart Cities

Studying people and technology for low-cost privacy-first smart cities.

Interactive AI

Speed Labeling

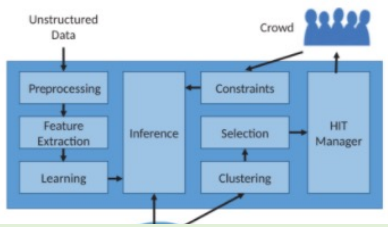
Creating labeled training data in faster and smarter ways.

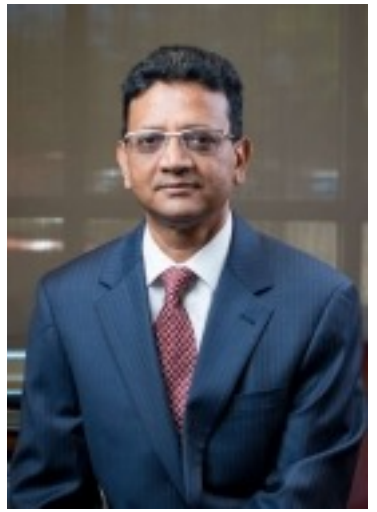
Event Extraction

Developing scalable method to identify and extract events from web documents.

Data Systems

Accelerating systems using machine learning, artificial intelligence, and human interventions.

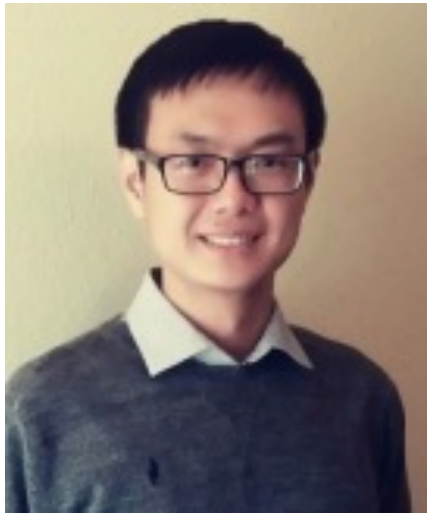
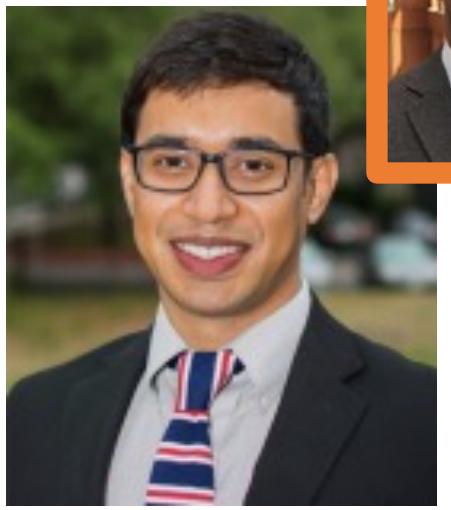




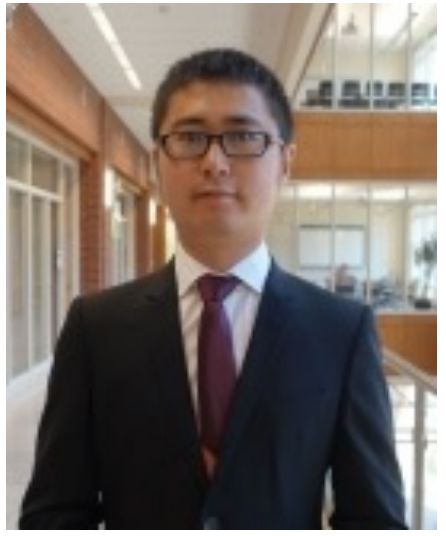
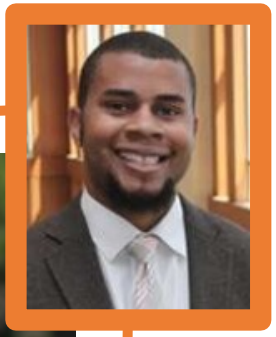
OU AI/MLProfessors in Computer Science

cs.ou.edu





WELCOME NEW FACULTY!

ACADEMIC YEAR 2020-2021

The OU School of Computer Science is proud to announce the new faculty joining this 2020-2021 academic year.

Golnaz Habibi

Rice University, MIT

Robotics, Control, Machine Learning, Multi Agent Systems, Autonomous Driving

Sina Khanmohammadi

SUNY, Binghamton
Washington University, St. Louis

Neural Data Science, Neuronal Dynamics, Network Neuroscience, Machine learning

Ji Hwan Park

SUNY, Stony Brook
Brookhaven National Laboratory

Data Visualization, Visual Analytics, Human Computer Interaction, Computer Graphics, Biomedical Informatics

Richard Veras

Carnegie Mellon University
Louisiana State University

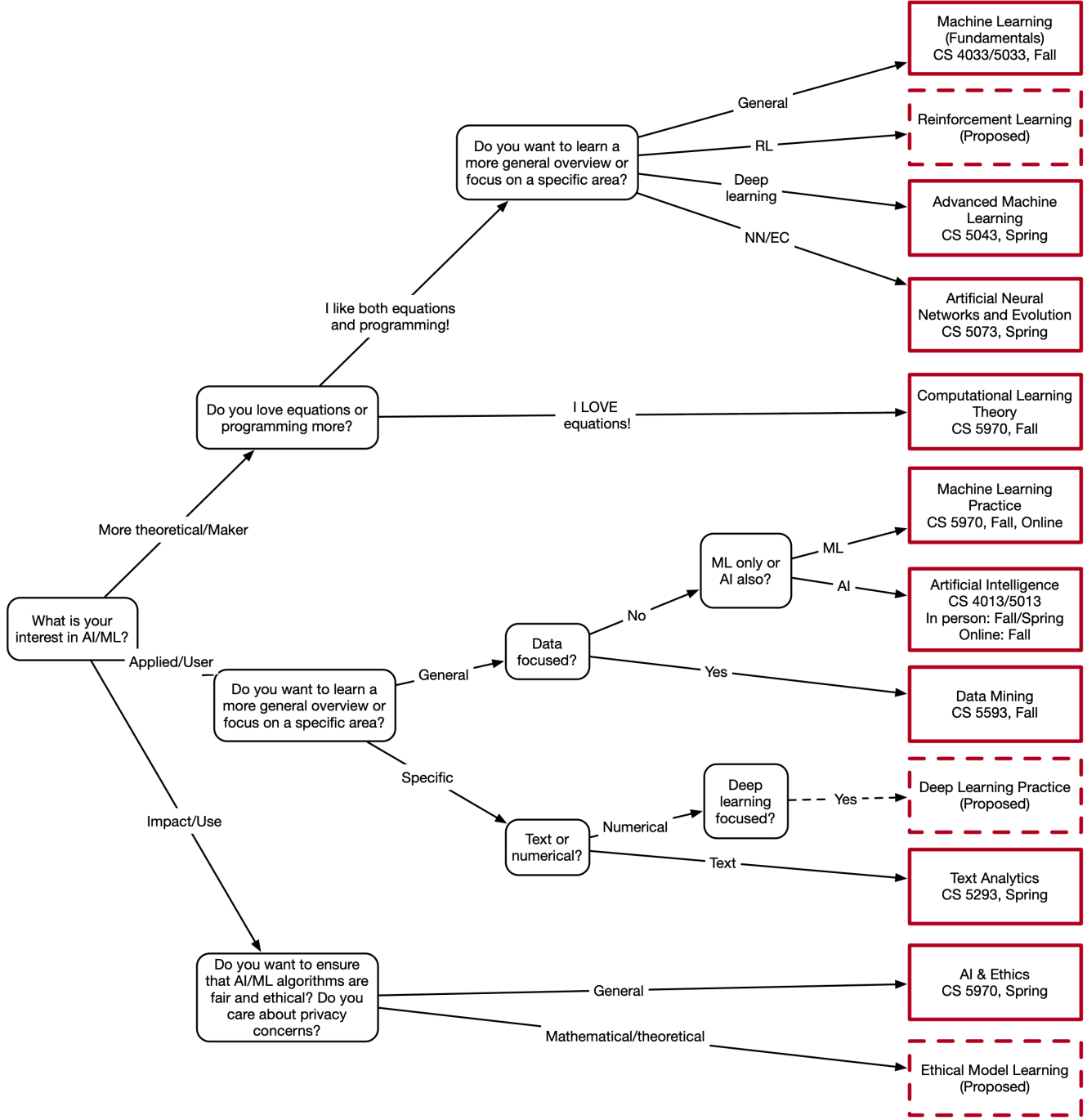
High Performance Computing, Graph Analytics, Computational Linear Algebra, Computer Architecture

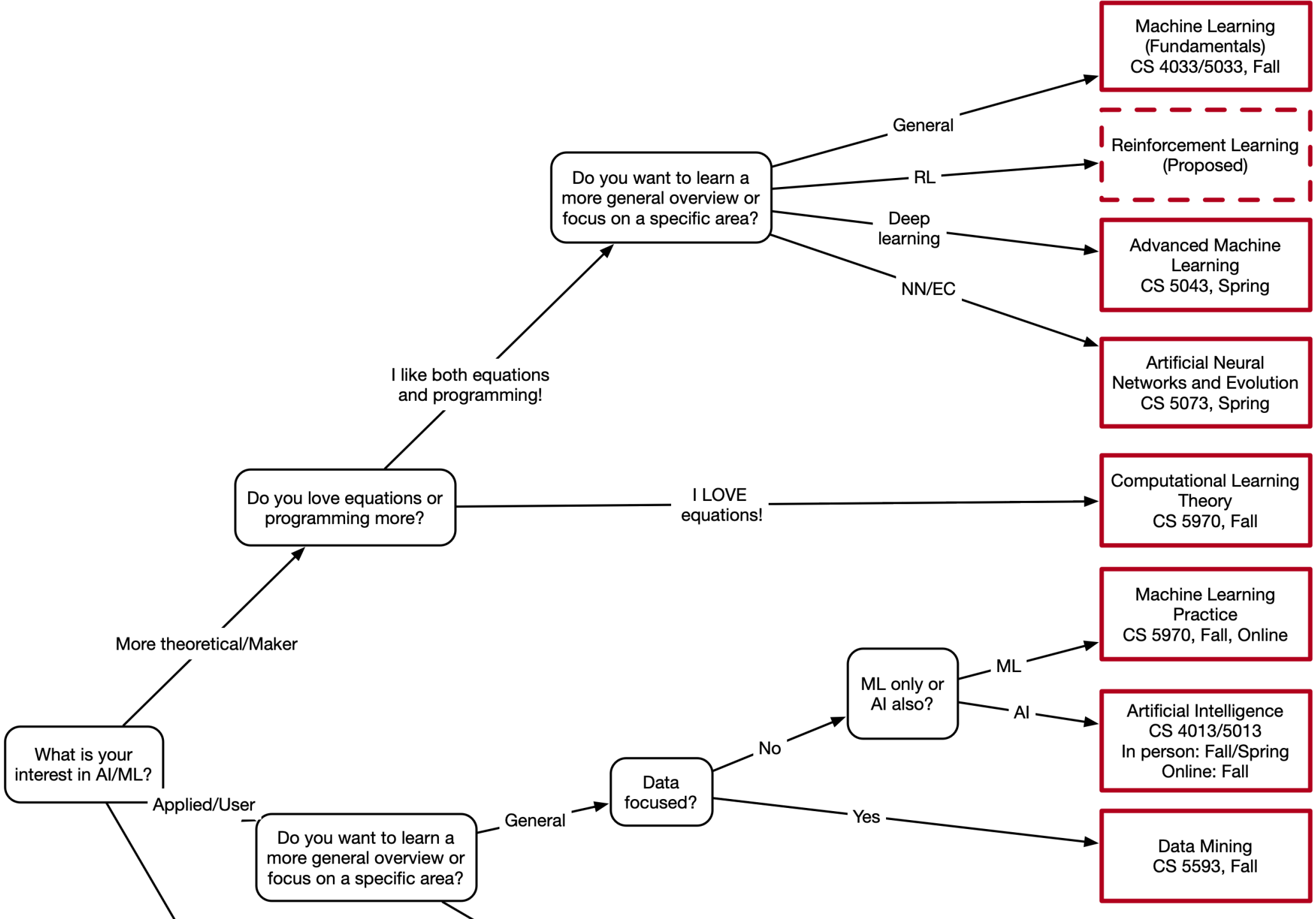
Shangqing Zhao

University of South Florida

Network Security, Mobile System Design, Wireless Security, Adversary Machine Learning, IoT Design, Online Privacy

Machine Learning and AI Classes in OU Computer Science


What is your interest in AI/ML?
More theoretical/Maker
Do you love equations or programming more?
I like both equations and programming!
Do you want to learn a more general overview or focus on a specific area?
General
Machine Learning (Fundamentals) CS 4033/5033, Fall
RL
Reinforcement Learning (Proposed)
Deep learning
Advanced Machine Learning CS 5043, Spring
NN/EC
Artificial Neural Networks and Evolution CS 5073, Spring
I LOVE equations!
Computational Learning Theory CS 5970, Fall
Applied/User
Do you want to learn a more general overview or focus on a specific area?
General
Data focused?
No
ML only or AI also?
ML
Machine Learning Practice CS 5970, Fall, Online
AI
Artificial Intelligence CS 4013/5013 In person: Fall/Spring Online: Fall
Yes
Data Mining CS 5593, Fall
Specific
Text or numerical?
Numerical
Deep learning focused?
Yes
Deep Learning Practice (Proposed)
Text
Text Analytics CS 5293, Spring
Impact/Use
Do you want to ensure that AI/ML algorithms are fair and ethical? Do you care about privacy concerns?
General
AI & Ethics CS 5970, Spring
Mathematical/theoretical
Ethical Model Learning (Proposed)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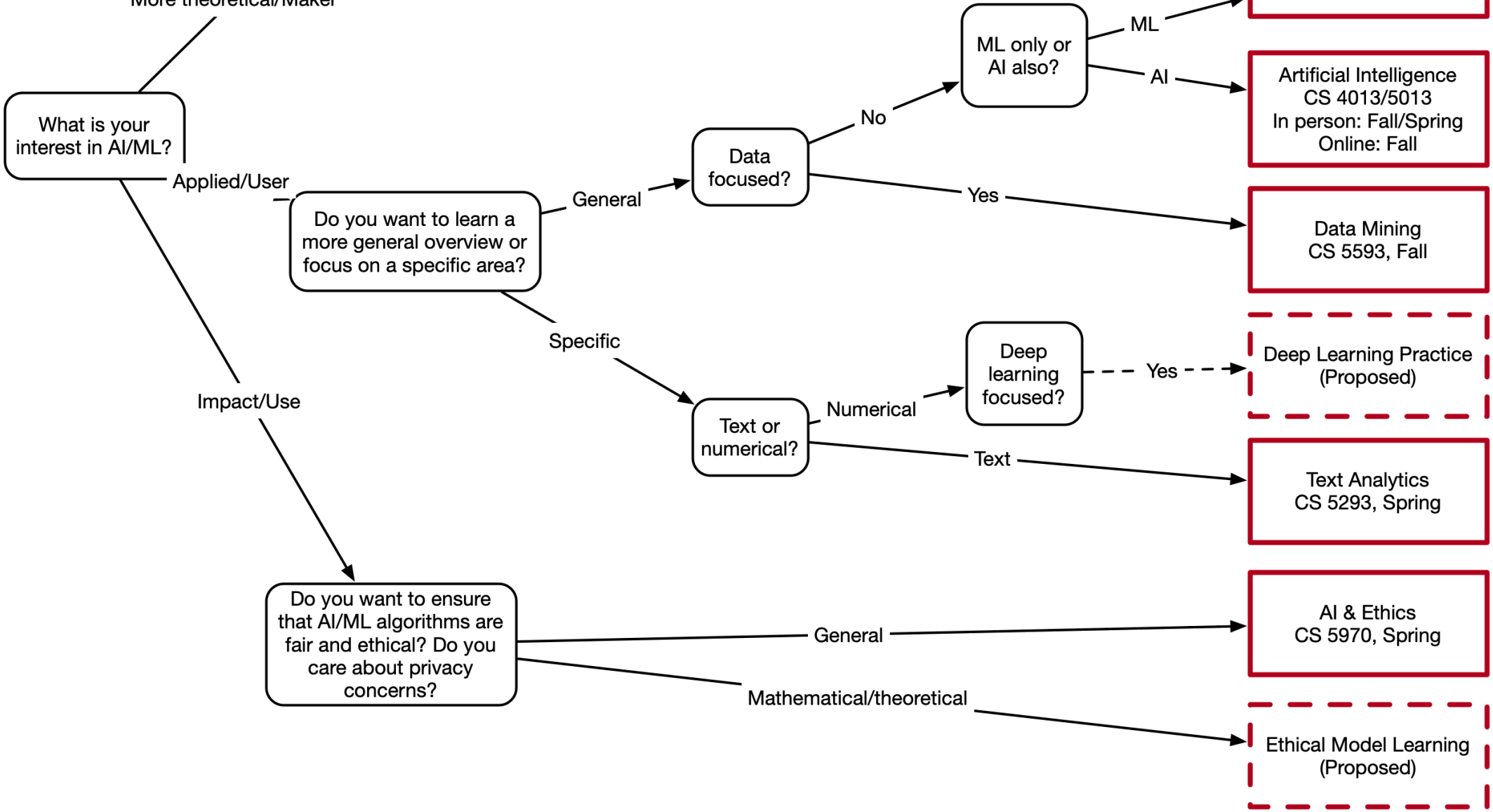
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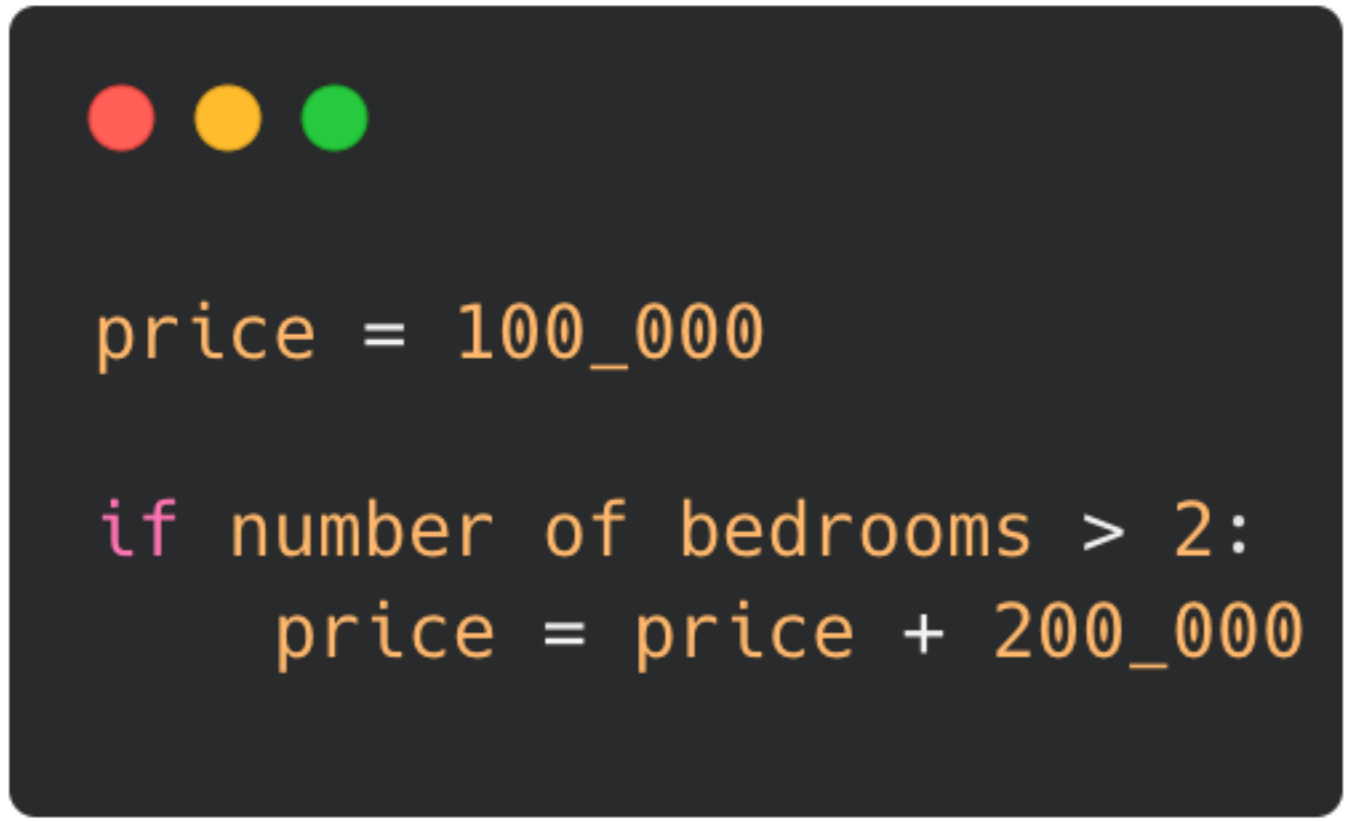
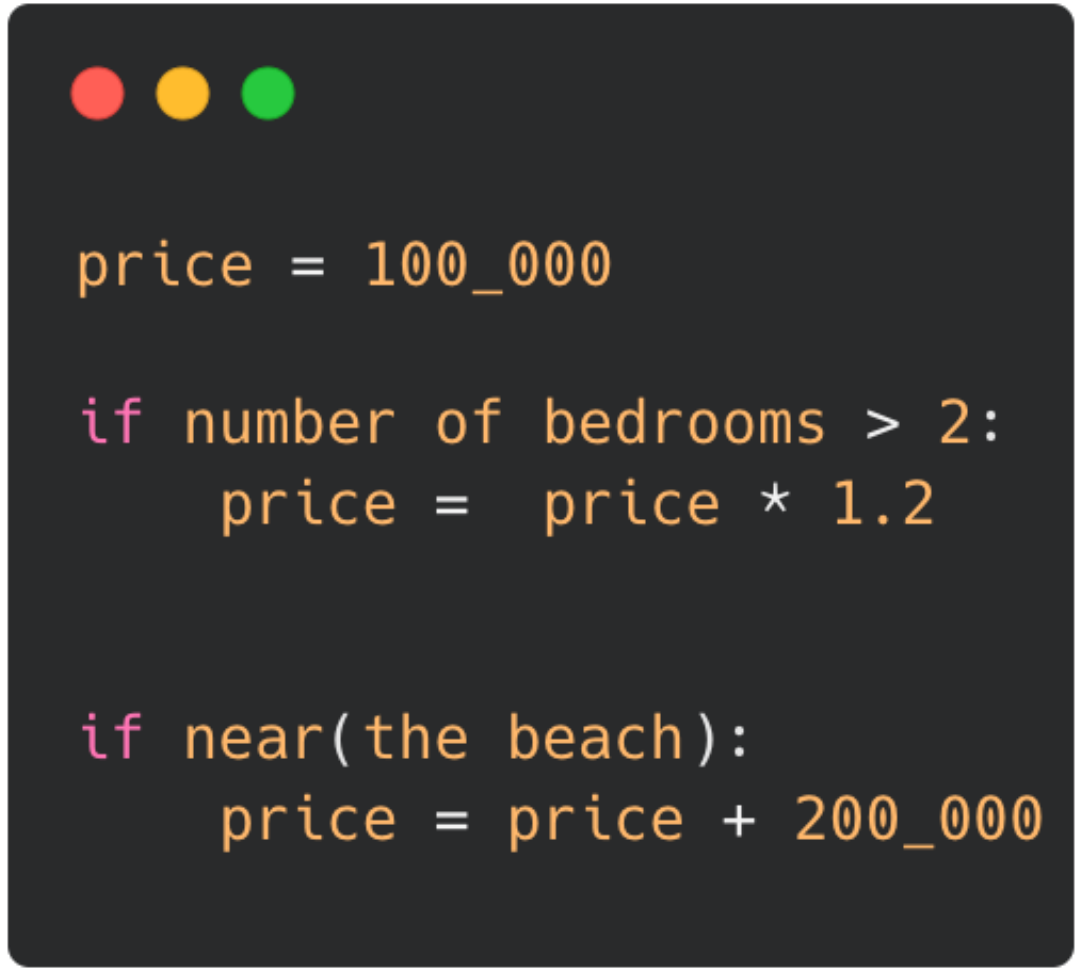
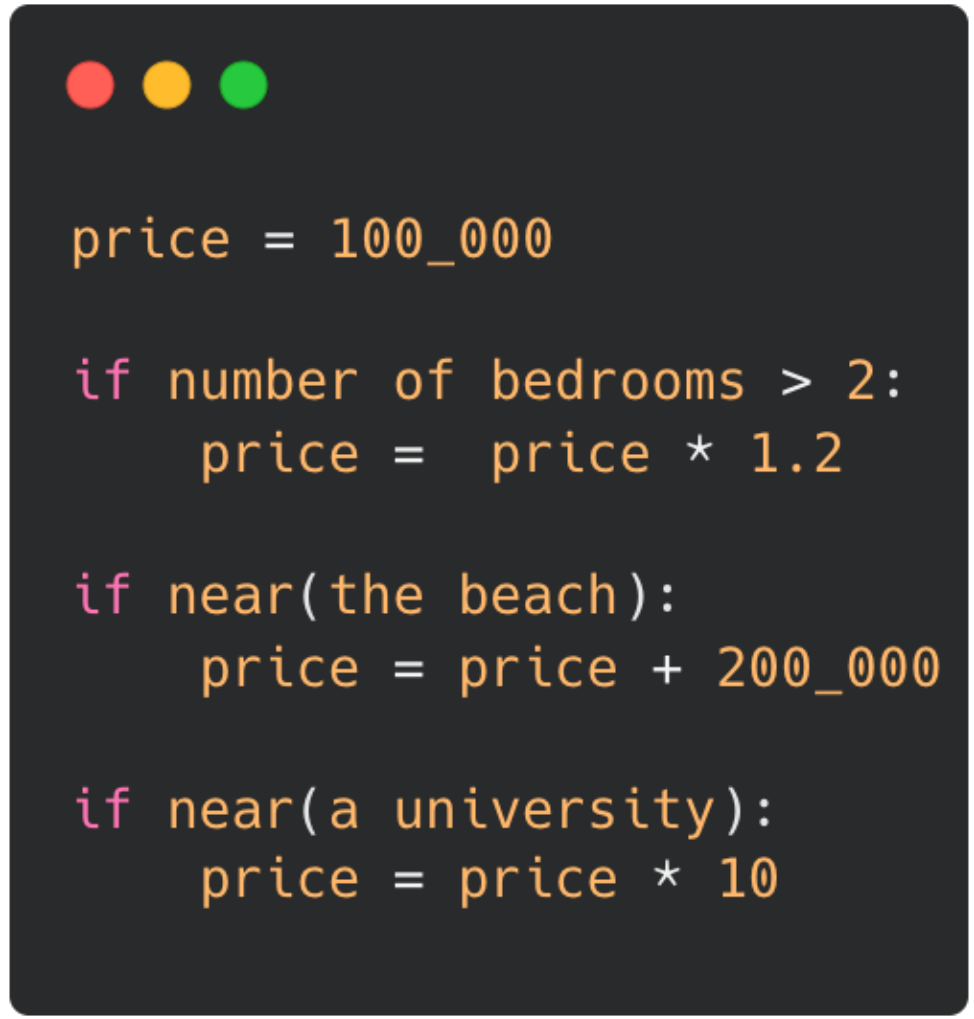
Machine Learning

With traditional programming …


price = 100_000
if number of bedrooms > 2:
price = price + 200_000


price = 100_000
if number of bedrooms > 2:
price = price * 1.2
if near(the beach):
price = price + 200_000



```
price = 100_000

if number of bedrooms > 2:
    price =  price * 1.2

if near(the beach):
    price = price + 200_000

if near(a university):
    price = price * 10
```

```
price = 100_000

if number of bedrooms > 2:
    price =  price * 1.2

if near(the beach):
    price = price + 200_000

if near(a university):
    price = price * 10

if has(a helipad):
    price = price + 1_000_000
```

A Machine Learning Approach

Detail Compact Column

80 of 80 columns

	YearBuilt	YearRemodAdd	RoofStyle	RoofMatl	Exterior1st
	9 1879 2010	1950 2010	Gable 80% Hip 18% Other (25) 2%	CompShg 99% Tar&Grv 1% Other (5) 0%	VinylSd 35% MetalSd 16% Other (719) 49%
	1961	1961	Gable	CompShg	VinylSd
	1958	1958	Hip	CompShg	Wd Sdng
	1997	1998	Gable	CompShg	VinylSd
	1998	1998	Gable	CompShg	VinylSd
	1992	1992	Gable	CompShg	HdBoard
	1993	1994	Gable	CompShg	HdBoard
	1992	2007	Gable	CompShg	HdBoard
	1998	1998	Gable	CompShg	VinylSd
	1990	1990	Gable	CompShg	HdBoard
	1970	1970	Gable	CompShg	Plywood
	1999	1999	Gable	CompShg	MetalSd
	1971	1971	Gable	CompShg	HdBoard
	1971	1971	Gable	CompShg	HdBoard
	1975	1975	Gable	CompShg	Plywood
	1975	1975	Gable	CompShg	Plywood

On Machine Learning…

What sound is being made?

What sound is being made?

Terminology

Artificial Intelligence

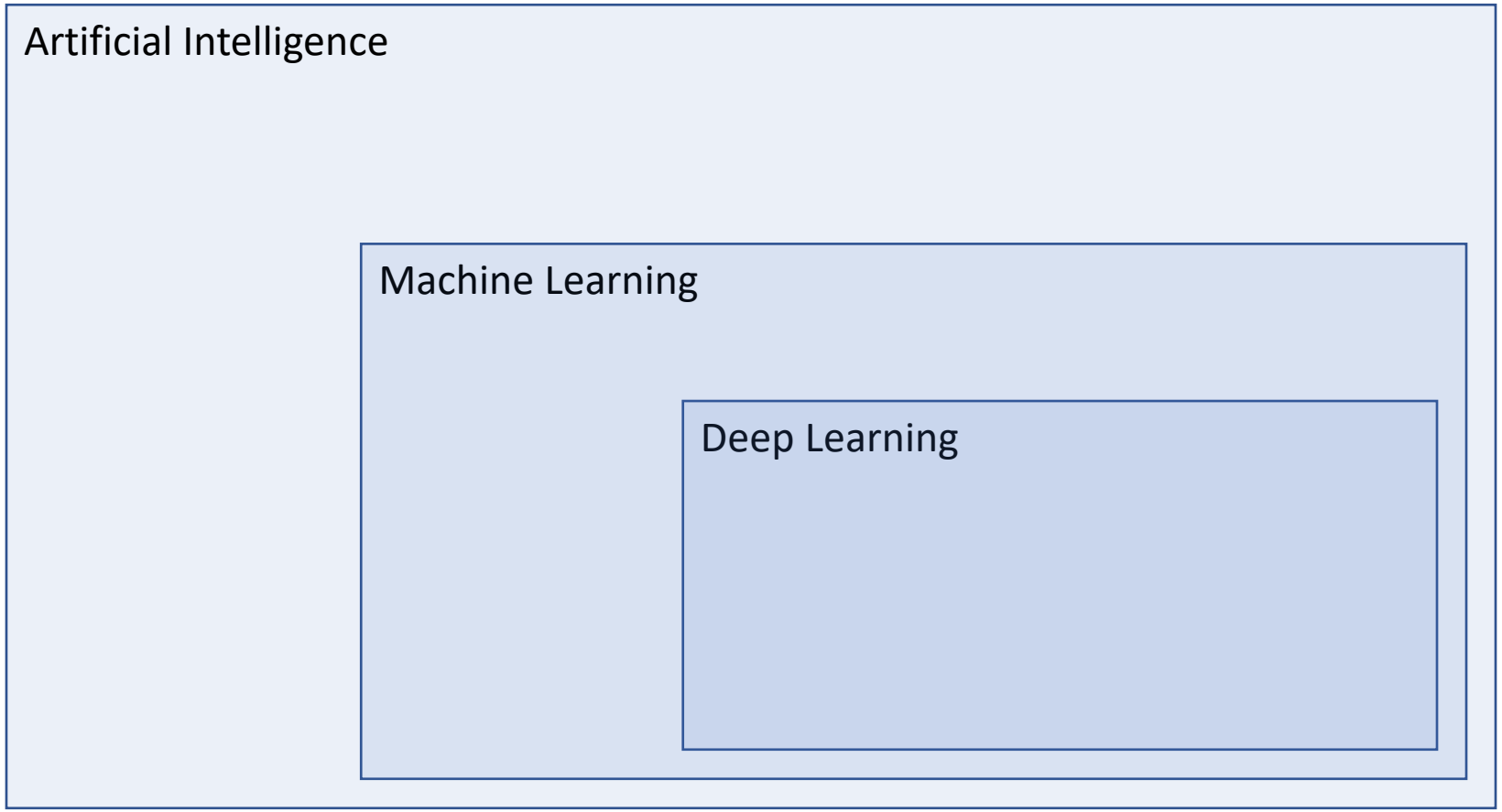
Machines that appear intelligent based on the tasks they perform

Machine Learning

A specific field of AI where a system learns to find patterns in examples, typically using statistics, in order to make predictions

Deep Learning

A machine learning approach that breaks a problem down into many pieces, so it can hopefully learn more from the training data


Artificial Intelligence
Machine Learning
Deep Learning

More Terminology

- Features

  Information drawn from examples which distinguish one example from another are the features in a machine learning system.

- Model

  A mathematical way the patterns and insights that a machine learning system learns from examples and is used to make predictions.

- Training

  The process of the machine learning a model.

- Testing

  Checking the performance of the trained model.

Thanks!

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