



DataBite – Summer 2021

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 Assistant 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 7-, 5-, and 3-year-old.

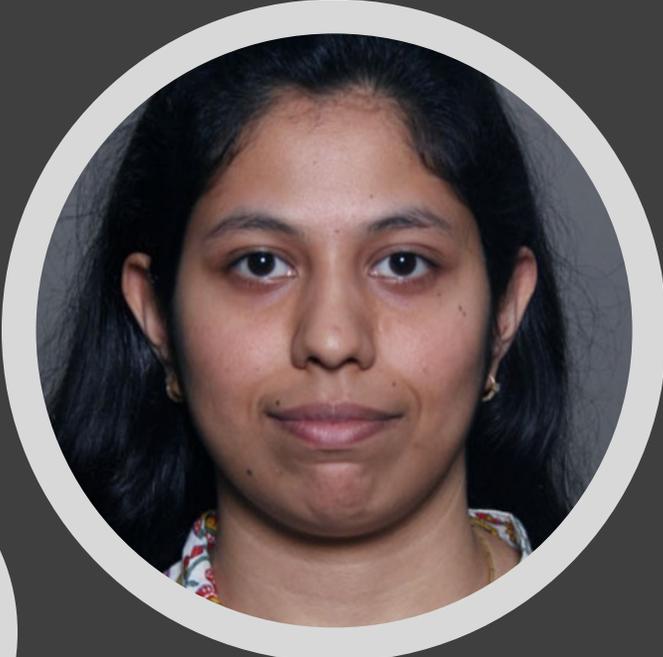
What is Data Bite?

- 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 **8** sessions.
- The goal is to get you interested in these topics and excited about learning more!



DataBite Summer 2021 Schedule

Day 1 Welcome	Day 2 Introduction to Python	Day 3 Introduction to Probability	Day 4 Model Olympics
Day 5 Socratic Seminar	Day 6 Bias and Fairness	Day 7 Natural Language Processing	Day 8 Deep Learning



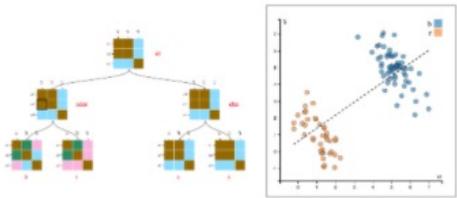
OU Data Lab Ph.D.
Students

About the OU Data Lab

Fairness Forensics

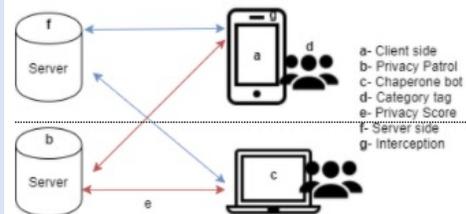
Wiggum

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.



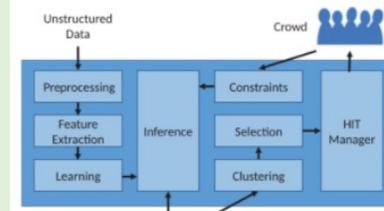
Event Extraction

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



Data Systems

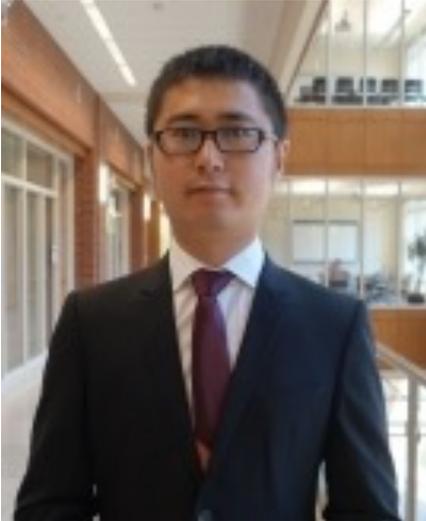
Accelerating systems using machine learning, artificial intelligence, and human interventions.





OU AI/ML Professors in Computer Science

cs.ou.edu





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

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

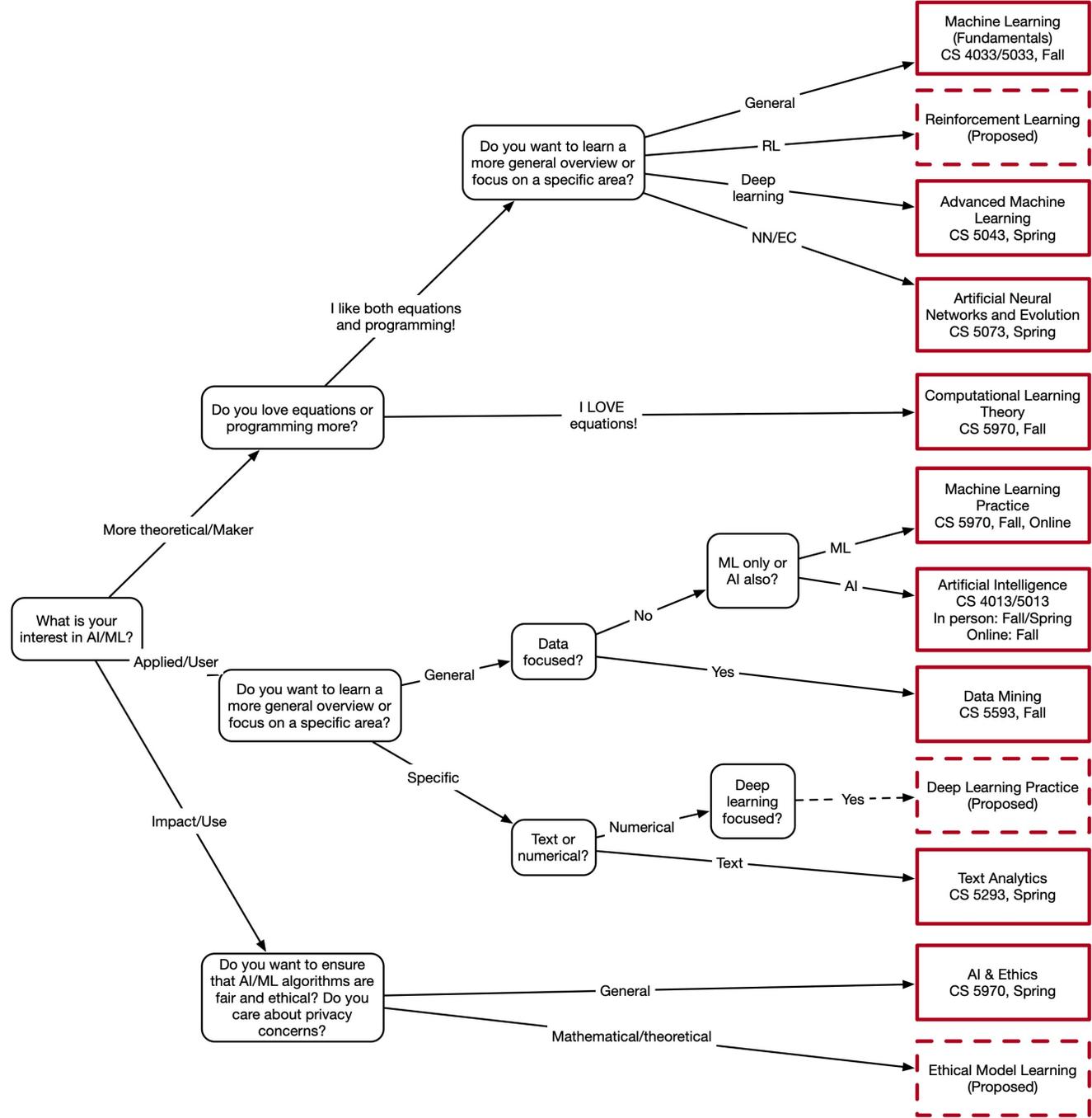


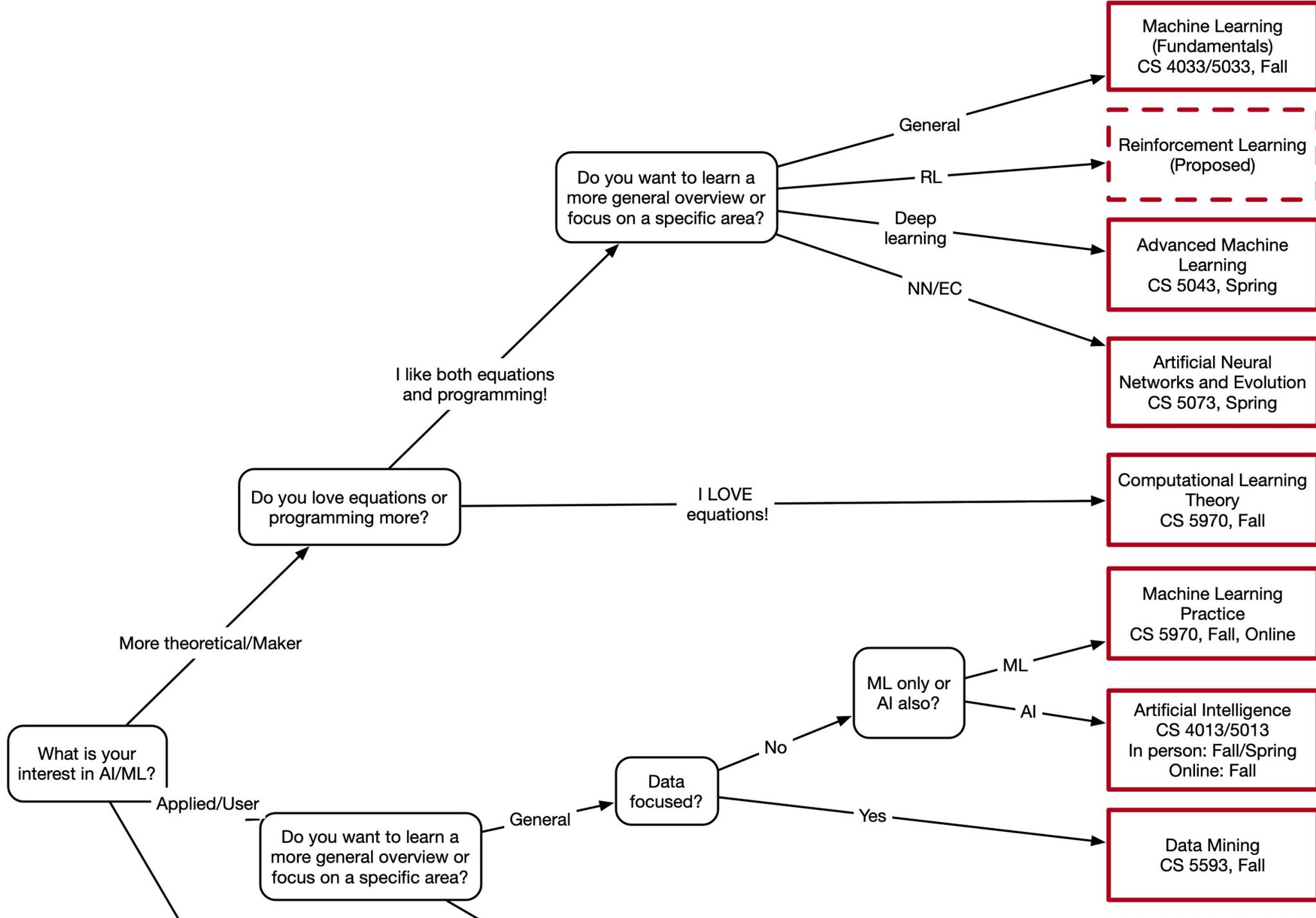
Shangqing Zhao

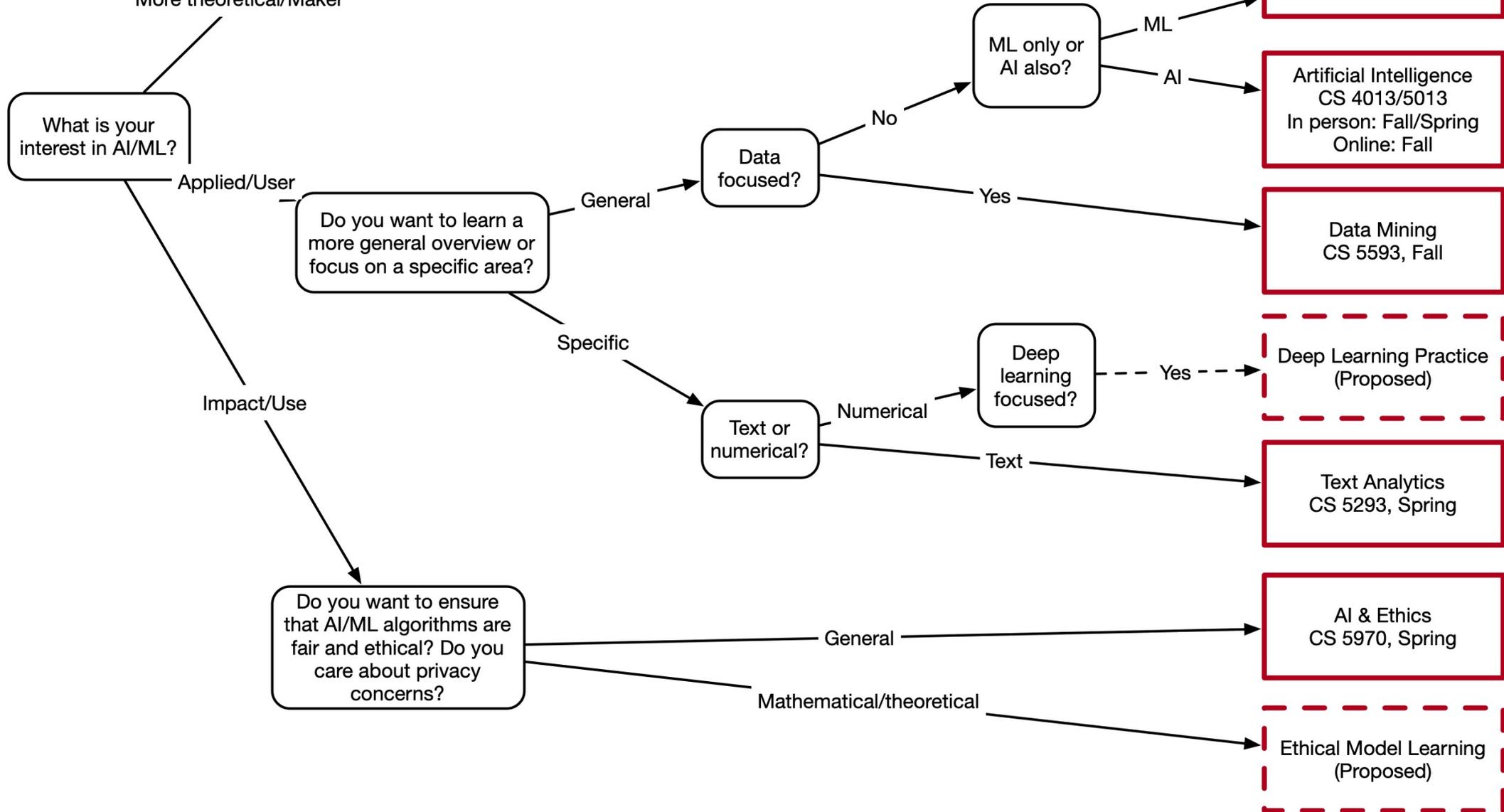
University of South Florida

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?

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

AI

Artificial Intelligence
CS 4013/5013
In person: Fall/Spring
Online: Fall

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?

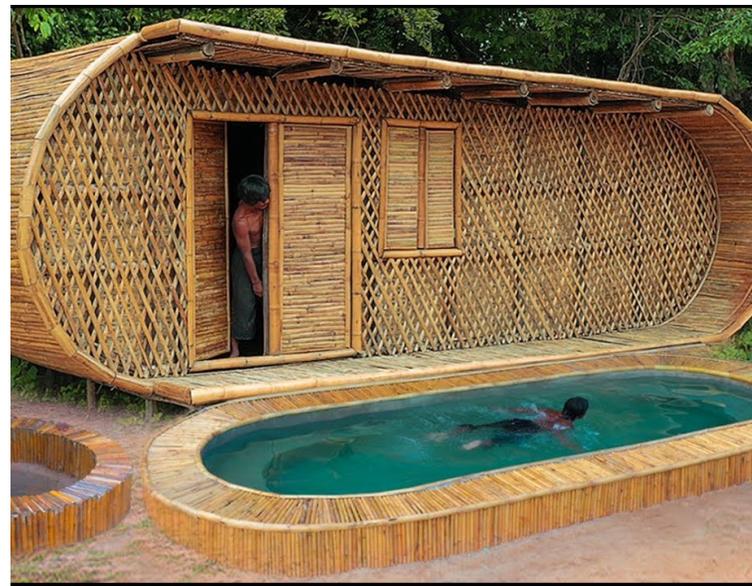
General

AI & Ethics
CS 5970, Spring

Mathematical/theoretical

Ethical Model Learning
(Proposed)

Machine Learning



With traditional programming ...



```
price = $4
```



```
price = $4
```

```
# if number of bedrooms > 2
```

```
price = price * 1.2
```



```
price = $4
```

```
# if number of bedrooms > 2
```

```
price = price * 1.2
```

```
# If near the beach
```

```
price = price + 200_000
```



```
price = $4
```

```
# 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 = $4
```

```
# if number of bedrooms > 2  
price = price * 1.2
```

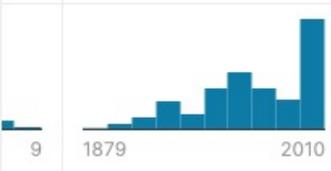
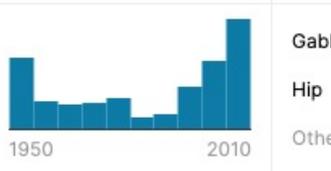
```
# If near the beach  
price = price + 200_000
```

```
# If near a university  
price = price * 10
```

```
# If it 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				Gable 80%	CompShg 99%	VinylSd 35%
				Hip 18%	Tar&Grv 1%	MetalSd 16%
				Other (25) 2%	Other (5) 0%	Other (719) 49%
	1879		1950	Gable	CompShg	VinylSd
	1961		1961	Hip	CompShg	Wd Sdng
	1958		1958	Gable	CompShg	VinylSd
	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

What sound is being made?



What sound is being made?

Meow!





Terminology

Artificial Intelligence

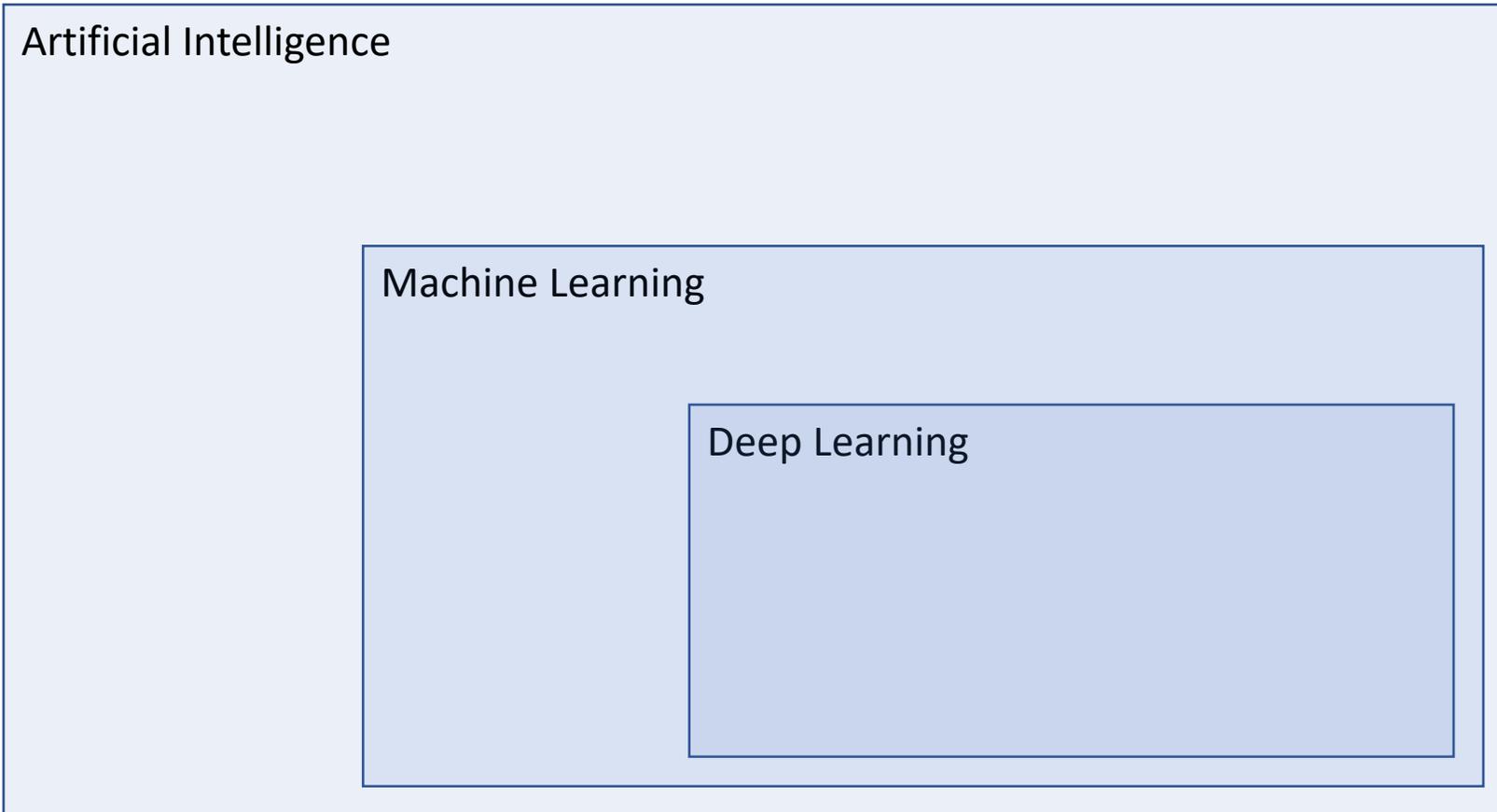
Machines that appear intelligent based on the tasks they perform

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.

Now it is your turn...

1. Merge into your groups.
2. Come up with an interesting machine learning application.
3. Generate a list of the most important **features**.
4. Present to the class.



Thanks!



@oudalab

