

# **ICCS482 Deep Learning**

## **Lecture 1: Introduction**

**Sunsern Cheamanunkul, Sep 8, 2020.**

# Course Outline

- Inspired by Stanford CS230 (<https://cs230.stanford.edu>)

## CS230 Deep Learning

Deep Learning is one of the most highly sought after skills in AI. In this course, you will learn the foundations of Deep Learning, understand how to build neural networks, and learn how to lead successful machine learning projects. You will learn about Convolutional networks, RNNs, LSTM, Adam, Dropout, BatchNorm, Xavier/He initialization, and more.

[Syllabus](#) [Piazza](#) [Lecture videos \(Canvas\)](#)

[Lecture videos \(Fall 2018\)](#)

Instructors



Andrew Ng      Kian Katanforoosh  
Instructor      Instructor

Time and Location

Tue 9:00 AM - 10:20 AM  
Zoom (access via "Zoom" tab of Canvas)

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# Course Outline

- 5 Main components:
  - Neural Networks and Deep Learning
  - Improving Deep Neural Networks
  - Convolutional Neural Networks
  - Sequence Models
  - Generative Adversarial Networks (Bonus)

# Logistics

- Online or On-campus
  - Let's take a vote
- Our class Canvas:
  - <https://canvas.instructure.com/enroll/M4E4G6>
- Discord channel:
  - <https://discord.gg/GWhM2Zs>

# Coursera

- Everyone should sign up for the the following online courses on Coursera:
  - C1: Neural Networks and Deep Learning
  - C2: Improving Deep Neural Networks
  - C3: Strategy for Machine Learning Projects
  - C4: Convolutional Neural Networks
  - C5: Sequence Models

# Coursera

- You must enroll before September 30, 2020!
- Registration Steps:
  1. Create account at Coursera: [www.coursera.org](http://www.coursera.org).
  2. Fill the form <https://bit.ly/3566MLV>.
  3. Check your email and complete the activation step.

# Quizzes and Assignments

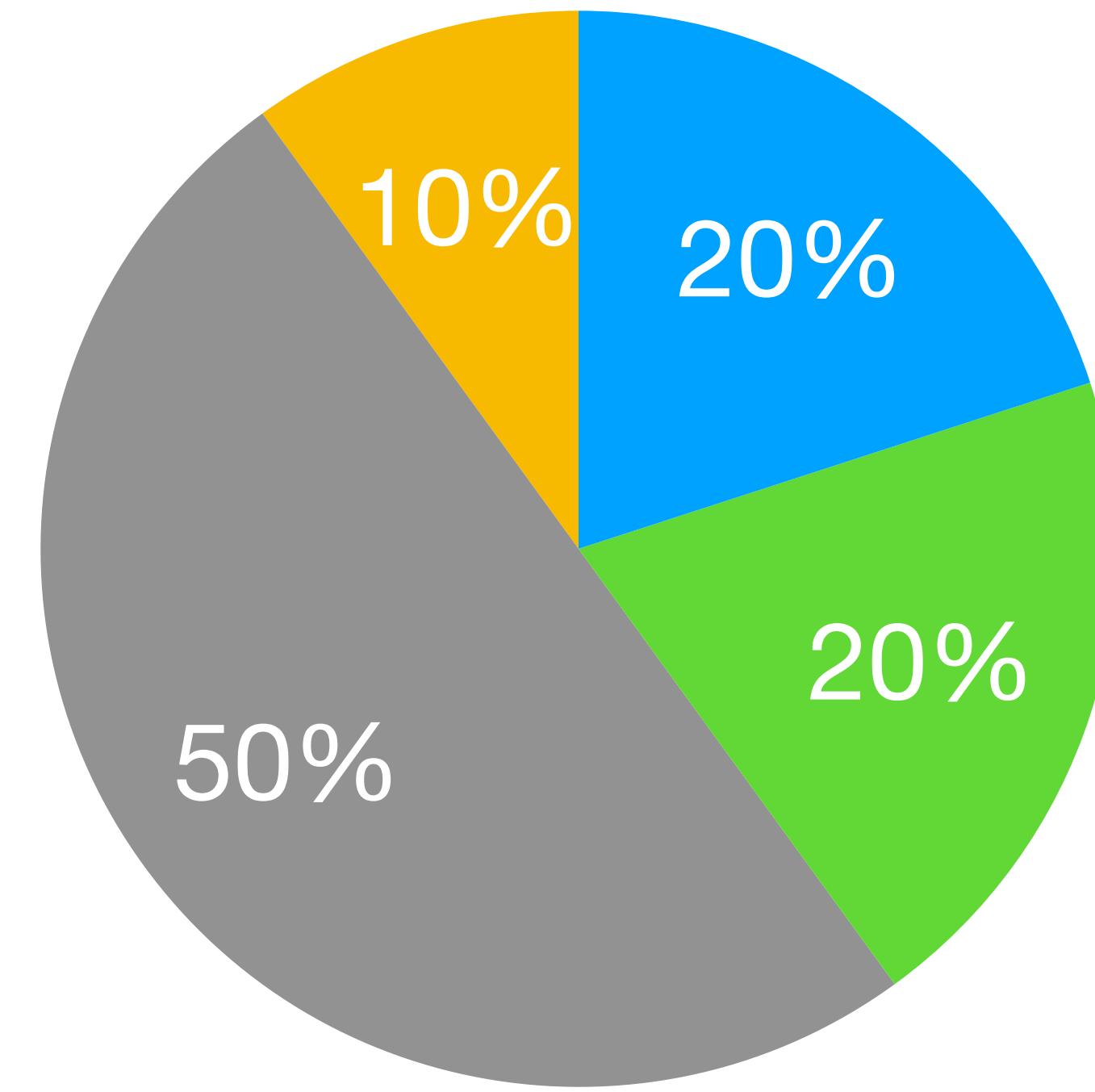
- We will have 4-5 quizzes
  - Multiple choice and short answers
  - and 2-3 programming assignments.

# Project

- You will choose a deep learning project to work on and present it at the end of the term.
- Hopefully, this project will make your resume look cooler!

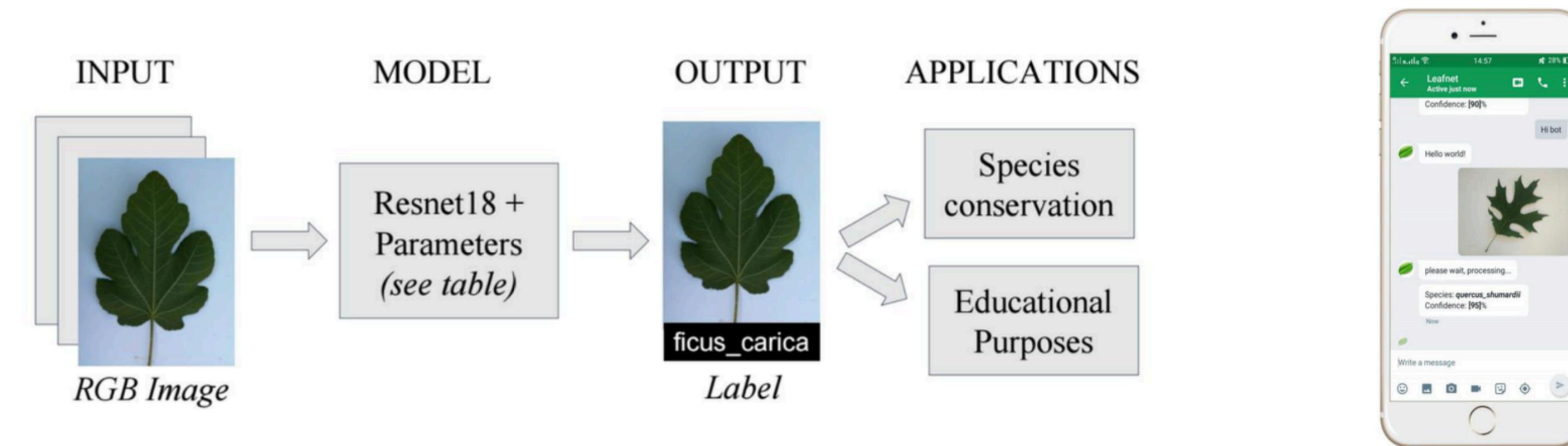
# Grading

● Quizzes   ● Assignments   ● Project   ● Participation

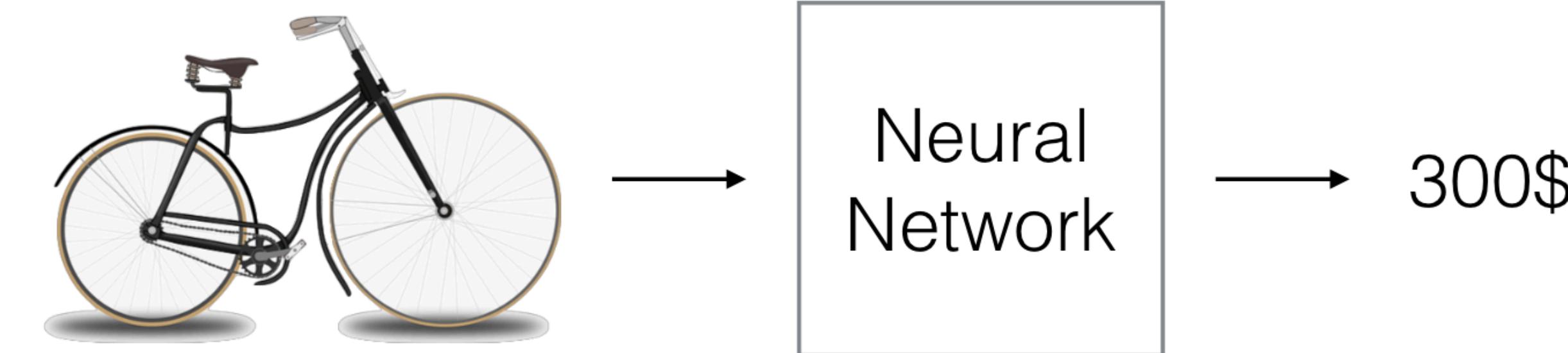


# Example Projects (from CS230)

## LeafNet: A Deep Learning Solution to Tree Species Identification



Predicting price of an object from a picture



# Example Projects (from CS230)

Detect cards from real-time video of tournaments to improve viewer understanding and accessibility

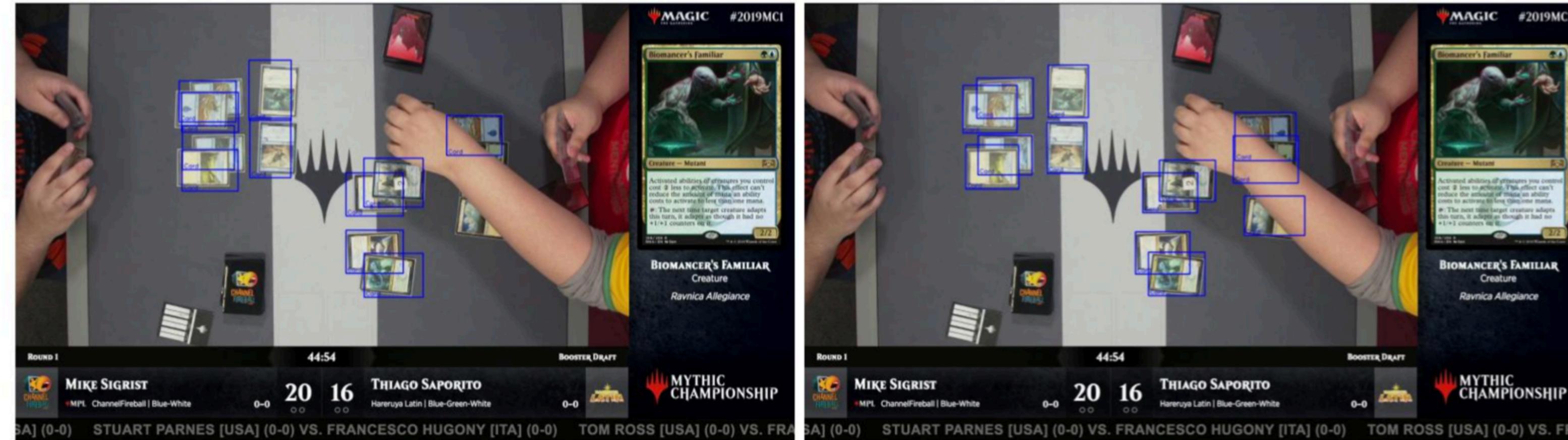
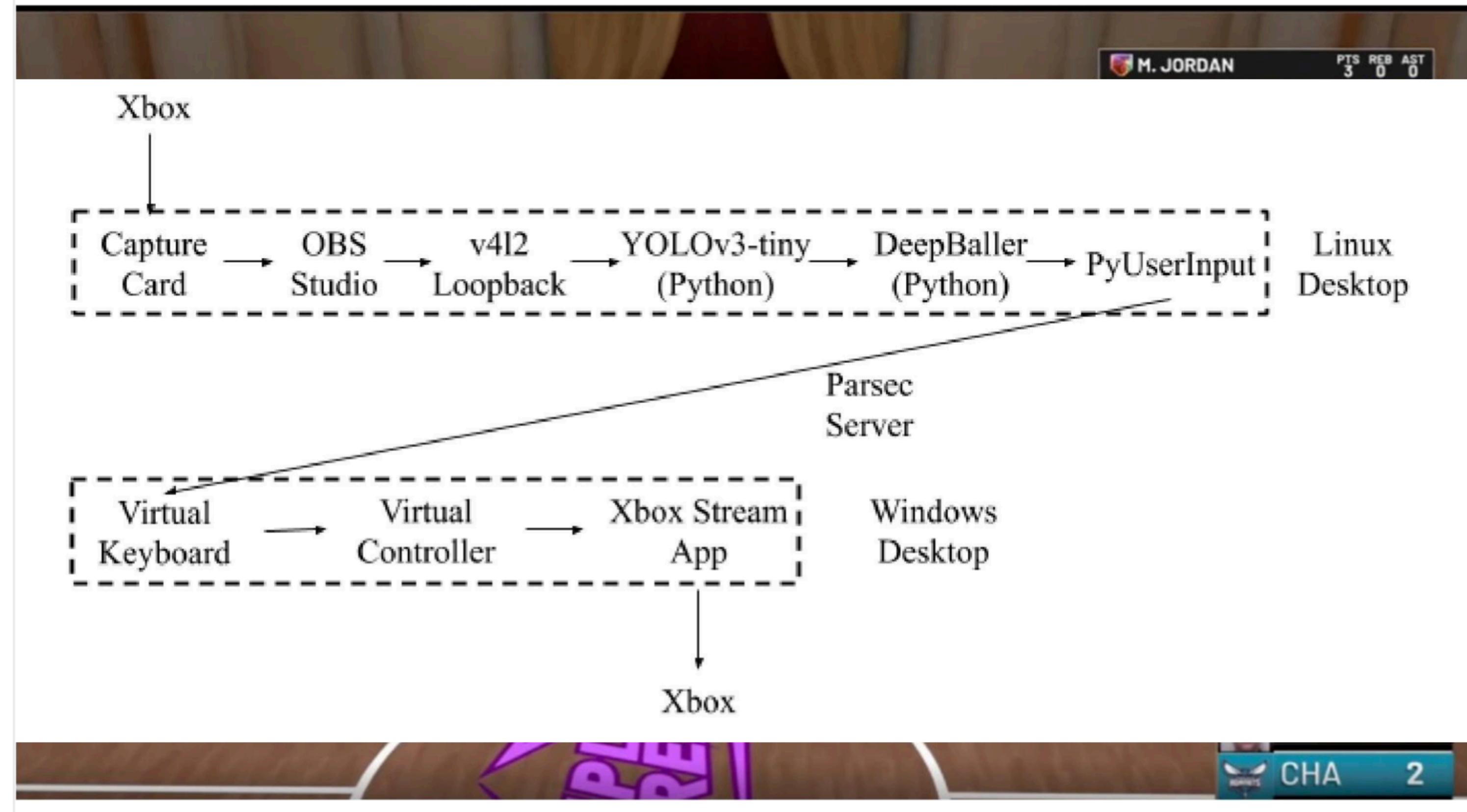


Figure 2: Predicted objects on a single frame from Dataset 1 produced by my model (left) and the YOLOv3 baseline (right).

# Example Projects (from CS230)

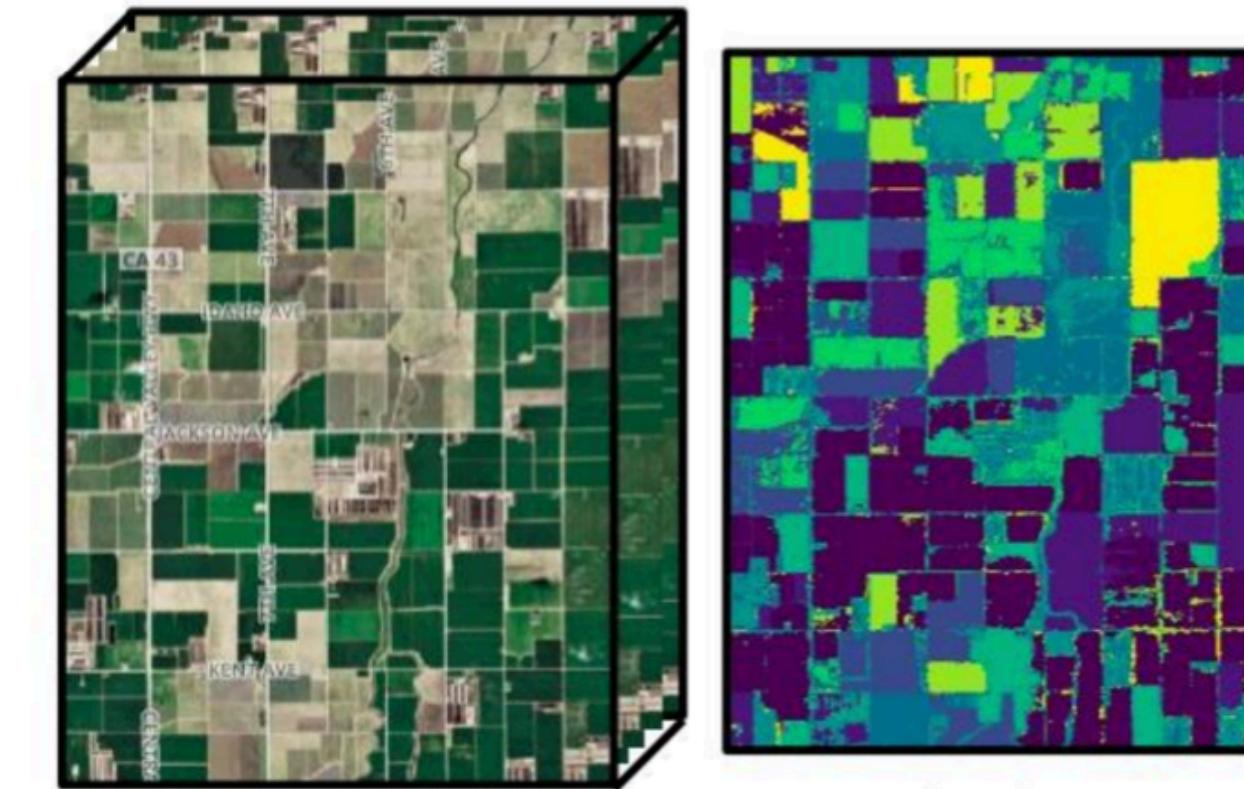
NBA 2k19 DeepBaller: A NN-Controlled Real-Time video game AI



# Example Projects (from CS230)

Crop-type classification for small holder farms

Visualization of  
the objective:  
Use temporal  
satellite imagery  
to map crop  
type from space.



Ground Truth



Masked Model Preds



# Example Projects (from CS230)

Image-to-Image translation with Conditional-GAN

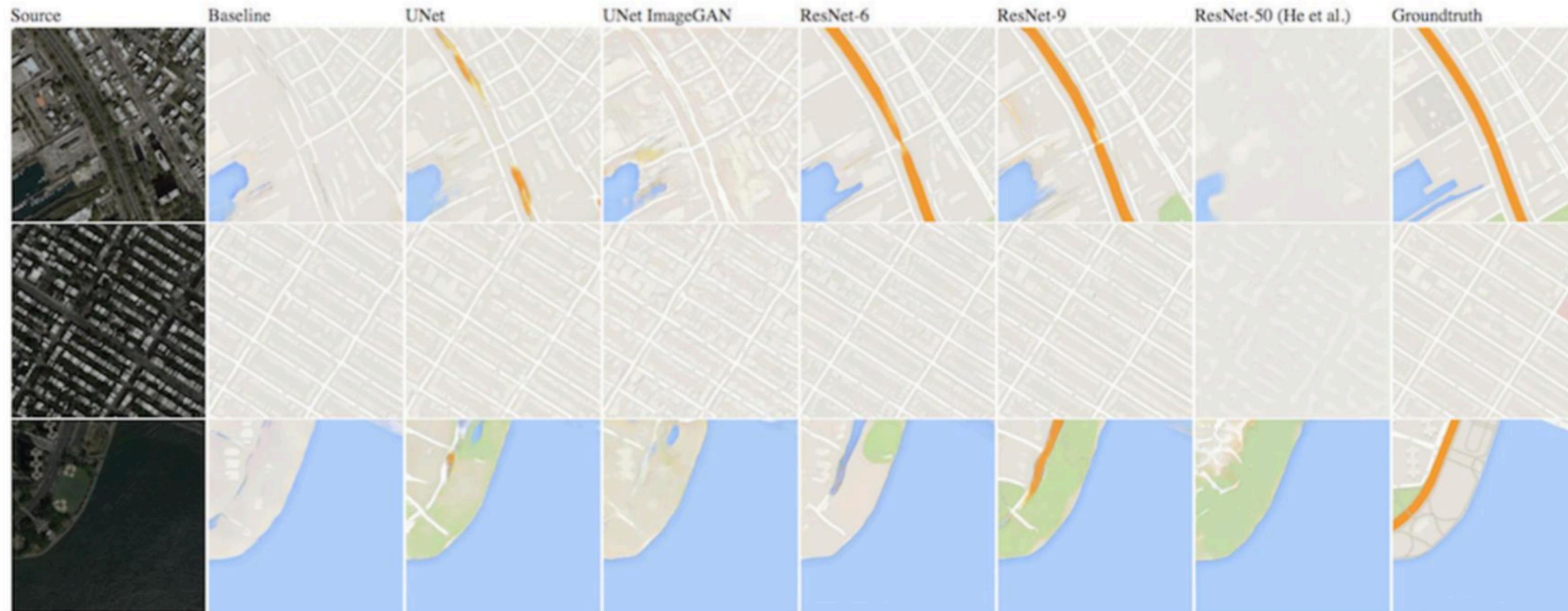


Figure 3: Generated map images of different architecture and hyperparameters. From left to right are source aerial images, baseline, U-Net, U-Net with ImageGAN, ResNet-6, ResNet-9, ResNet-50, and ground truth map images

# And more...

- Check them out here:
  - <http://cs230.stanford.edu/past-projects/>

# Tools

kaggle colab

K Keras   
Caffe TensorFlow  
 PyTorch