Starting soon!

Intro to AI

CS Club 22/23
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What is AI?

AI:

- Artificial Intelligence
  - Ability to make decisions based on inputs
  - Can be simple if statements
    - Ex. Game AI
  - Generally refers to machine learning
    - Much more complicated to make
    - Ex. ChatGPT

Machine Learning

- Subset of AI that is made via "training"
  - Given a set of inputs, and outputs
    - Never given instructions to get output
  - Tries to figure out the instructions to get the output
    - Generally involves very complex math
  - Outputs a model that can be used on new data

Machine Learning Cont.

- Training generally follows the same pattern
  - Rank
  - Cull (choose the best)
  - Modify

Teachable Machine

What is it?

- Made to be able to train models easily
- A free website, from Google
  - Simple to use, and can be exported to a multitude of different platforms
- https://teachablemachine.withgoogle.com/

Trying it:

- Rock, Paper, Scissors
  - Give it images (inputs)
  - Give it labels (outputs)
  - Test with a new, unseen, image
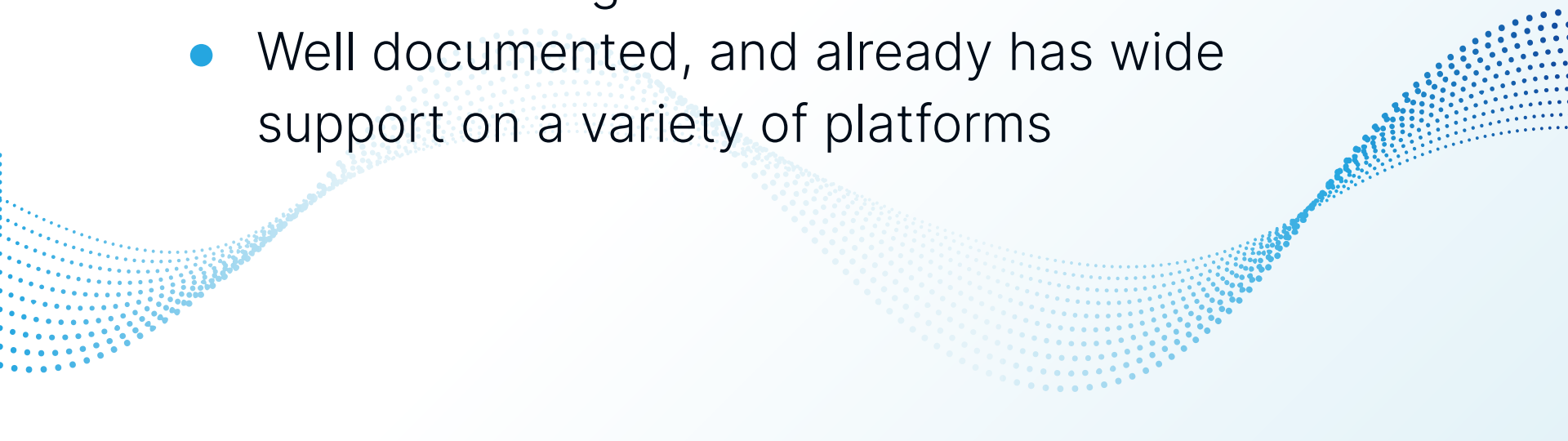- Can use online images, or webcam

Exporting to Code

- Variety of options
  - All are types of TensorFlow
  - Each serve a different purpose
    - TensorFlow.js (Web)
    - TensorFlow (Desktop)
    - TensorFlow Lite (Mobile / Embedded)

TensorFlow?

TensorFlow

- Made by Google, framework for working with AI & ML
- Makes working with ML much easier
- Well documented, and already has wide support on a variety of platforms

Installation

- Google Colab
  - https://colab.research.google.com/
- Locally
  - CPU and GPU version
    - GPU version installation is complicated, and so we will use CPU
  - `pip install TensorFlow`

Demo

- Export our trained model to our installed location
- Try it out with an image
  - Use your webcam or a picture online, depending on how you trained it

Training Using TensorFlow

- Currently, we are using a pretrained model
- We can create our own using TensorFlow
  - Handwritten digits recognition
    - Like the "hello world" of ML
    - Use a built in dataset, and test it on an image