User Input via Hand Detection

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Introduction of Problem

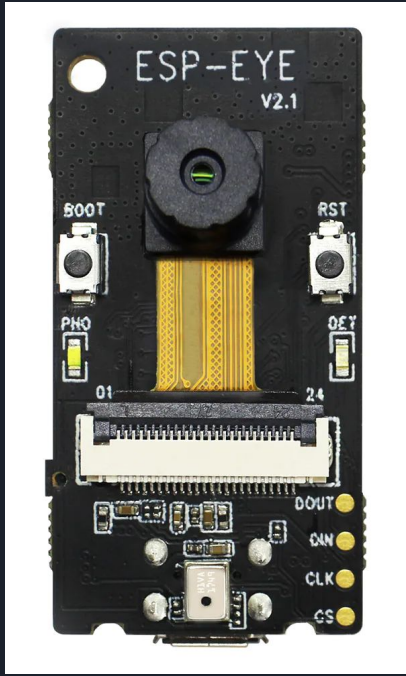
- Popularity of hand tracking technology
- Our initial idea
- Where we started

Technical Challenge

- Hand detection in general is tough due to variance
- The dataset used in training must make up for this variance
- Implementing the model on an embedded system reduces data allowance

Related Works

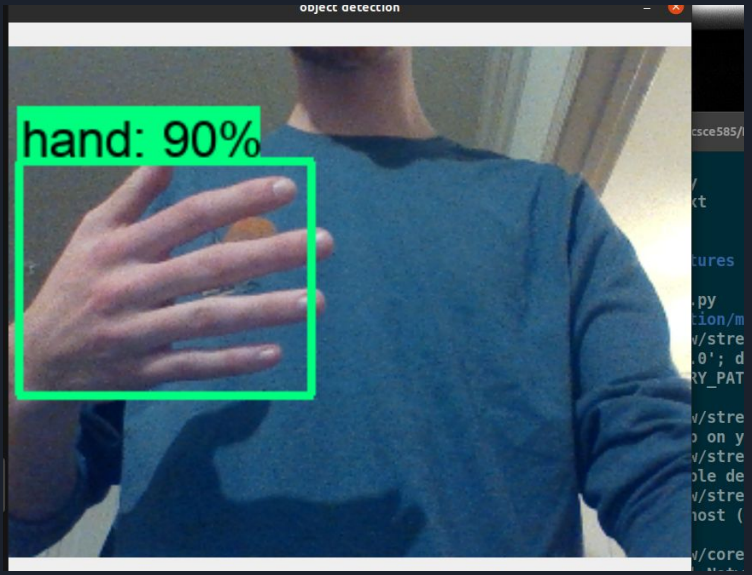
- Gesture and Hand Recognition quickly reaching the forefront of hands free computing
- Inspired by Google's gesture recognition model
- Use of embedded systems aligned with our original goal

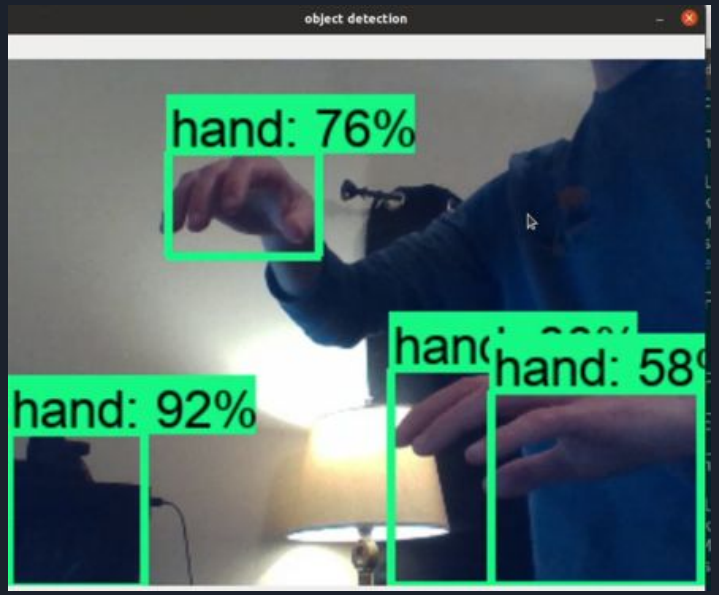


Our Approach

- Use of Google Colab, EgoHands dataset, and TensorFlow object detection model
- Took 400 frames at random and used 360 for training with the remaining 40 for testing
- Test our model with a python script utilizing openCV

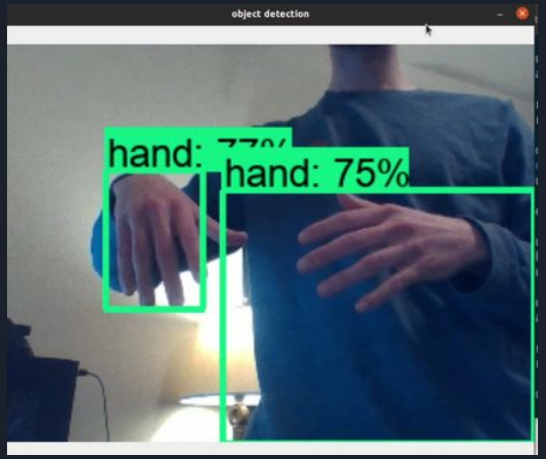
First Results





Adjustments for Robustness

- More skin tones in data set
- Different angles of the hands
  - Multiple gestures
  - Flatter angles



Broader Impact

- We see this technology being used in a variety of commercial and residential settings
- What we have worked on so far has its limitations
- Implementation on embedded system would increase this variety further