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

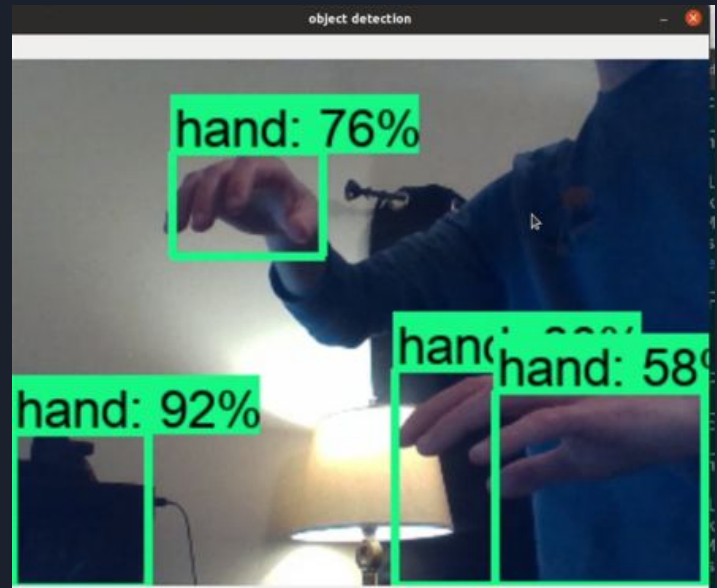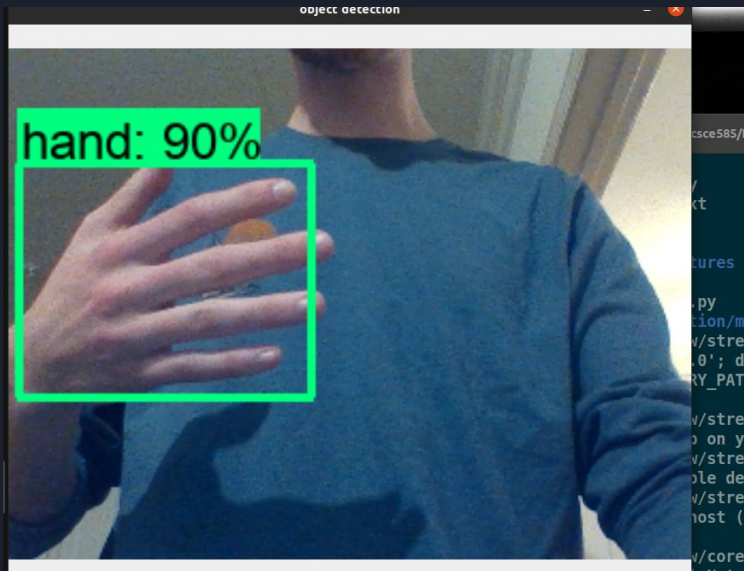- Use of embedded systems aligned with our original goal

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

- Post processing adjustments

- More skin tones in data set

- Different angles of the hands
  - Multiple gestures

  - Flatter angles
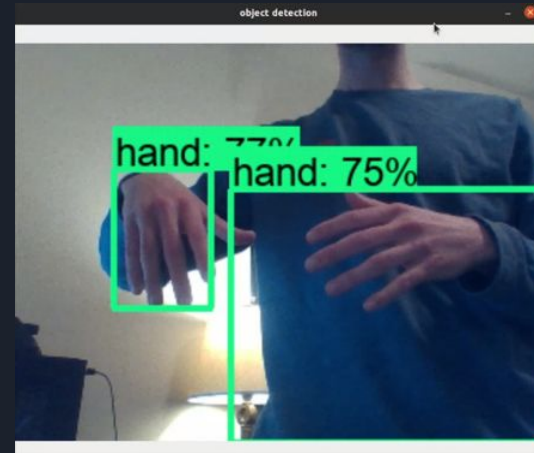
Broader Impact

- 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