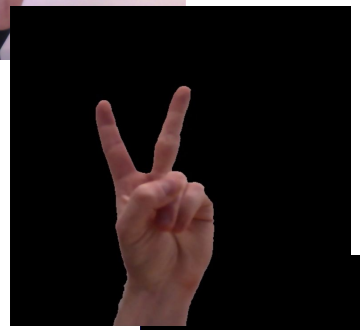
Give Me a Sign: Gesture Detection with Neural Networks

Brenner Heintz

Building the Data

- Created a region of interest (ROI) box on webcam
- Take photo of background, create a background mask
- Use binary thresholding to isolate the hand
- 5 gestures, 550 images each



Peace Palm Okay L Fist

Process

Convert files

- Convert image files into NumPy arrays

- Convert to grayscale with Pillow

Design

- Used Keras & TensorFlow

- Used VGG-16 model with 4 dense layers on top

Train

- Trained in the cloud with AWS
- Cross-validated the model with Kaggle data

Evaluate

- **F-1 Score: 98%**
- **Precision: 98%**
- **Recall: 98%**
- **Test with real time video on webcam**

Smart Home Application

- Connect to Sonos and Philips Hue APIs

SONOS

hue

PHILIPS

- Created custom gesture bindings


Prediction: Palm (100.0%)
Action: Lights on, music on

Thank You

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