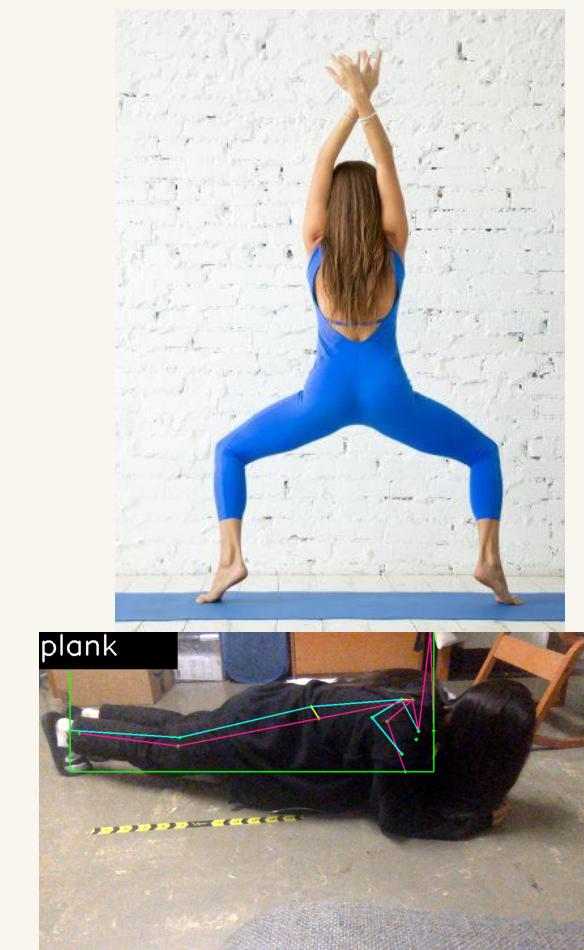


# YogaBot: Real Time Yoga Pose Detection

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### Motivation

The popularity of yoga has grown significantly in recent years, but mastering yoga poses on your own can be challenging. We want to motivate people to pursue this low-stress form of exercise and stay fit with the assistance of our pose detector.



### Problem Approach in Brief

#### Person Detection

We first need to account for whether a person is actually in frame or not. We used a trained CNN to detect whether a person was in frame.

#### Yoga Pose Classification

We need to be able to classify a range of yoga poses. We decide to use a pre-trained MoveNet model to detect joint locations, then used a neural network to classify the pose.

### Goals

1. Accurately detect many different yoga poses through a live camera feed
2. Make the camera feed classify poses only when a person is present in the camera



### Elaboration on Problem Approach

#### Person Detection

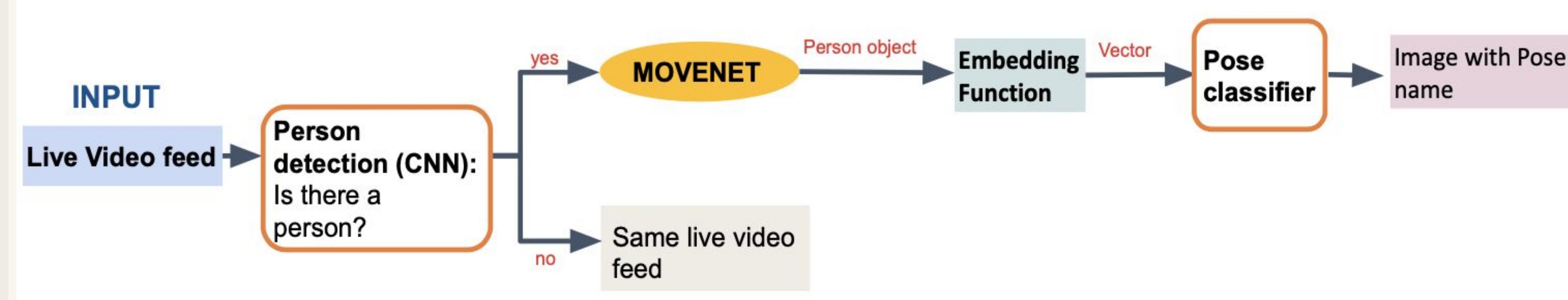
For the CNN, we stack two 2D convolution layers, a MaxPool layer, a Dropout layer, repeat the above, and feed it through two more Dense layers. If no person is detected, the original image is output.

#### Yoga Pose Classification

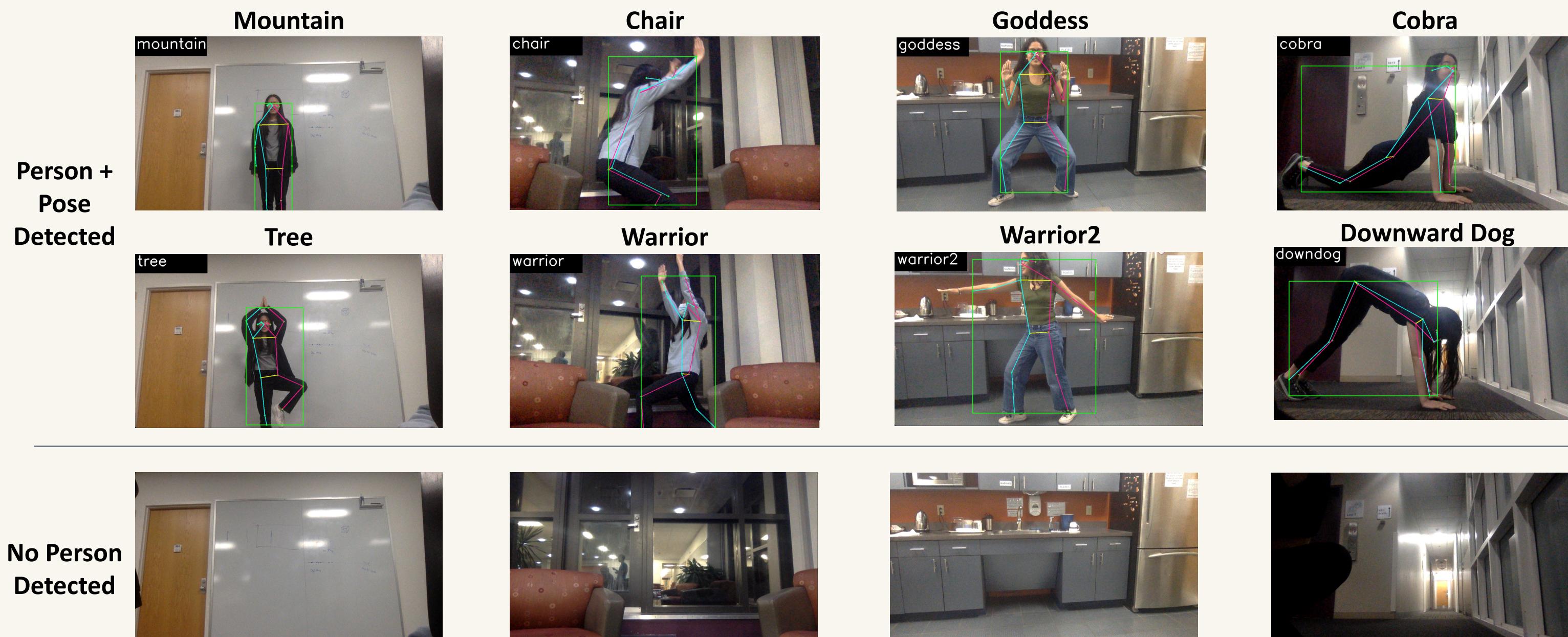
If a person is detected, it is fed through the pre-trained MoveNet model, which detects locations of joints on the person. These joint locations are normalized and fed through the dense layers of our pose classifier.

We want our model to detect 9 poses: Chair, Tree, Goddess, Mountain, Warrior, Warrior2, Downward Dog, Cobra, Plank

### Model Diagram



### Results (images/figures)



### Training Results

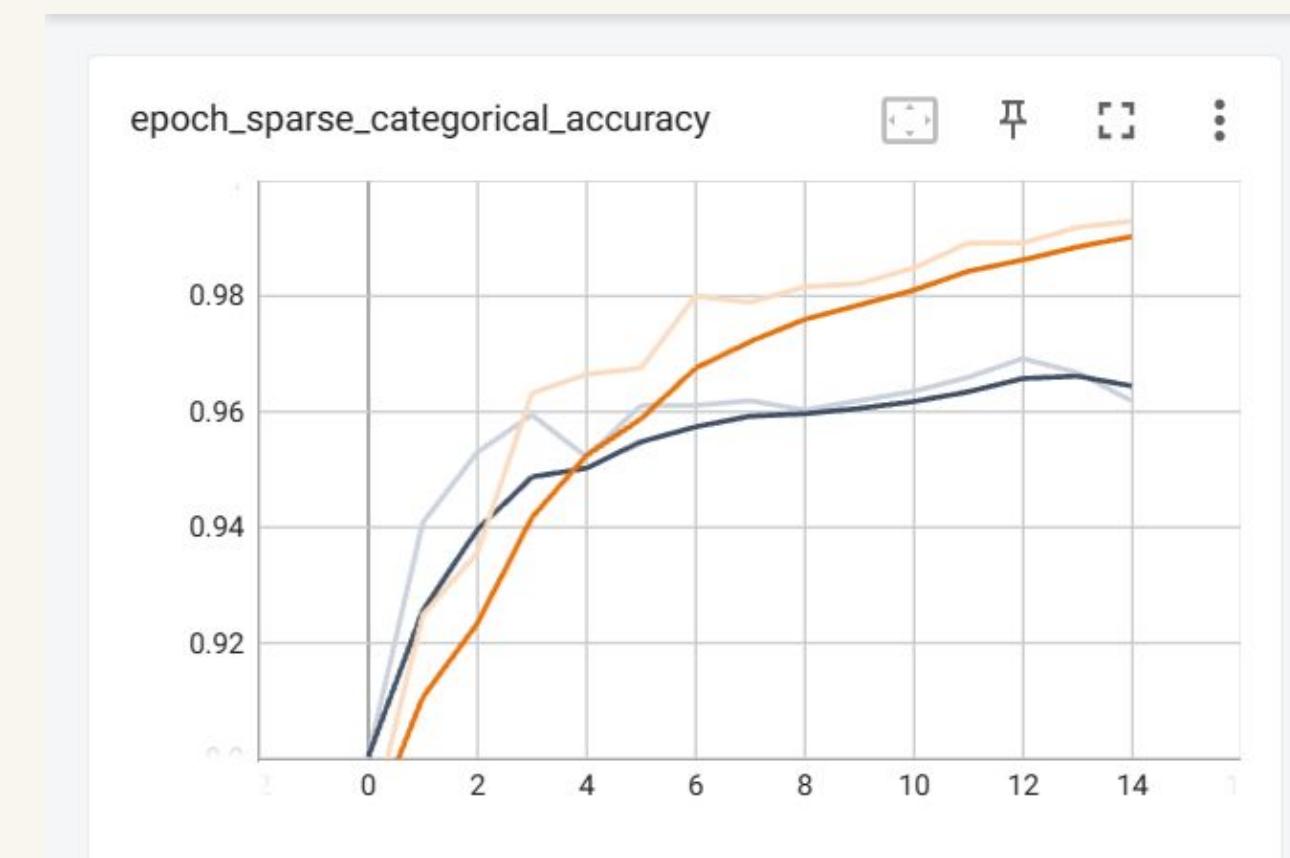
#### Person Detection CNN Model

Final Accuracy: 92%



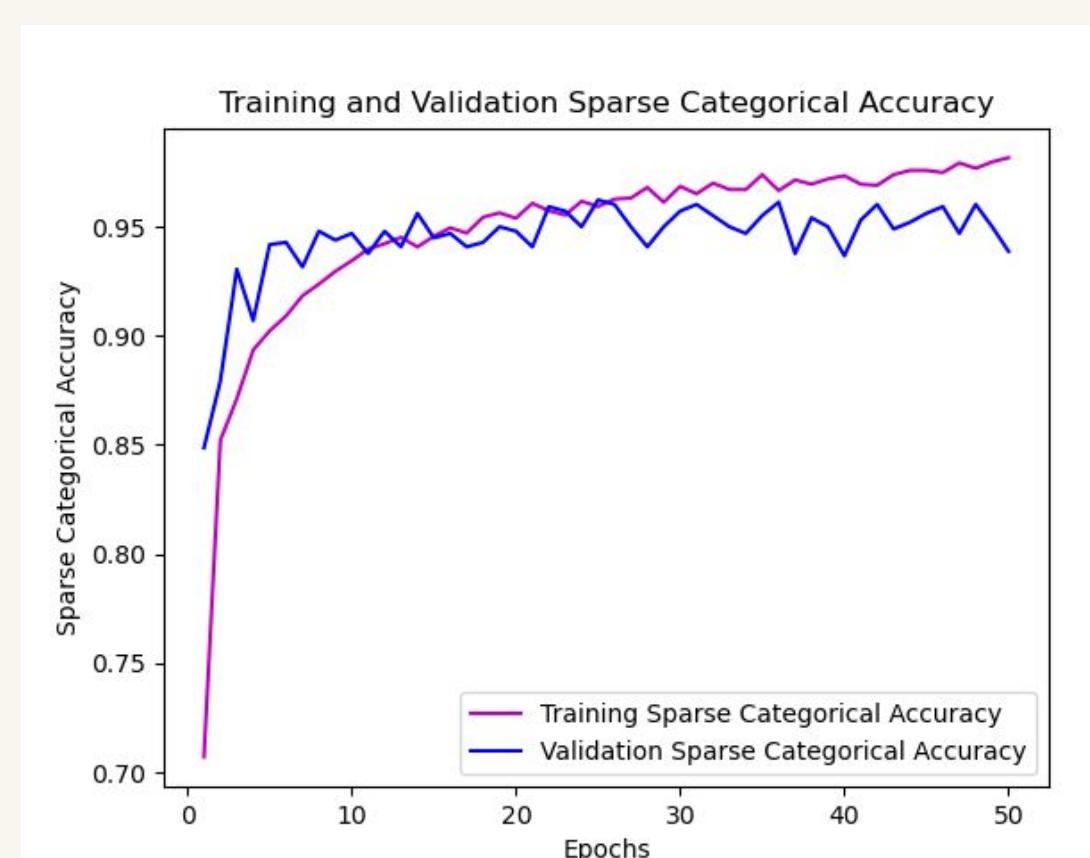
#### Person Detection VGG Model with Head

Final Accuracy: 96%



#### Pose Detection Model

Final Accuracy: 94%



### References

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