instructAR

Enhancing Teaching Experience with AR

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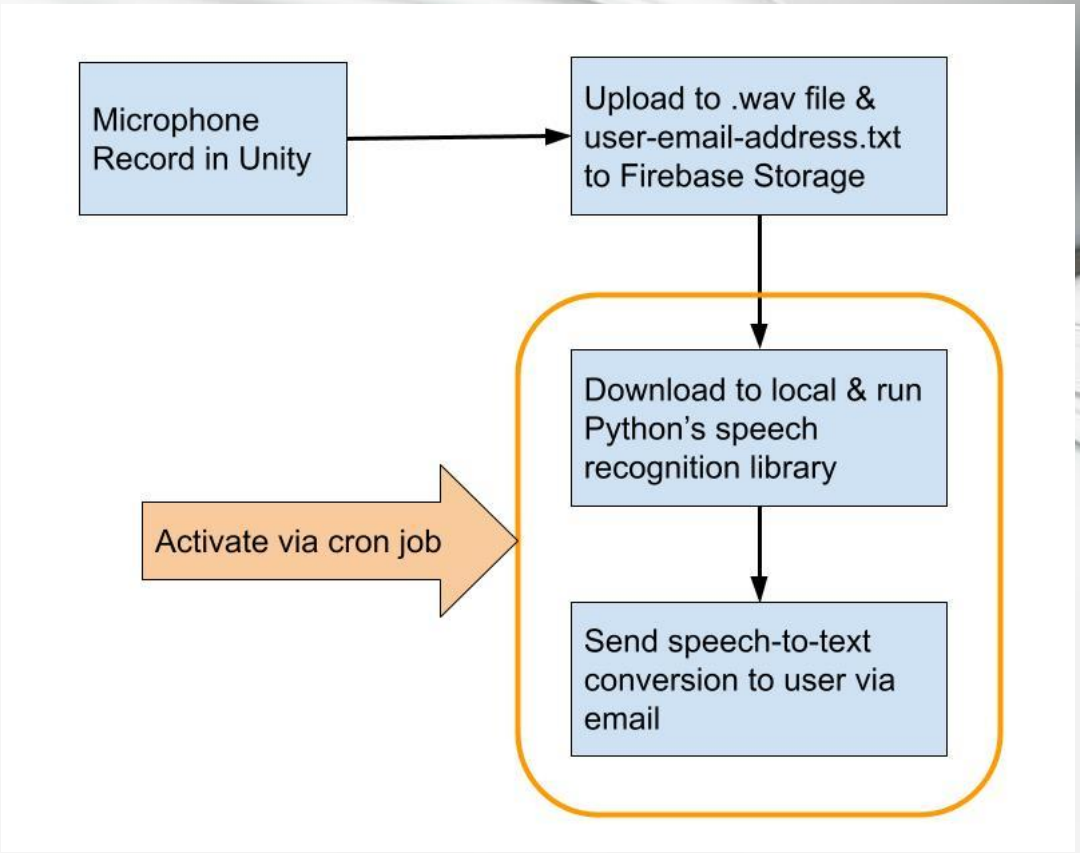
Progress

1. Finished face-based sentiment detection (without masks)
2. Finished AR student business card
3. Finished Emoji Overlay

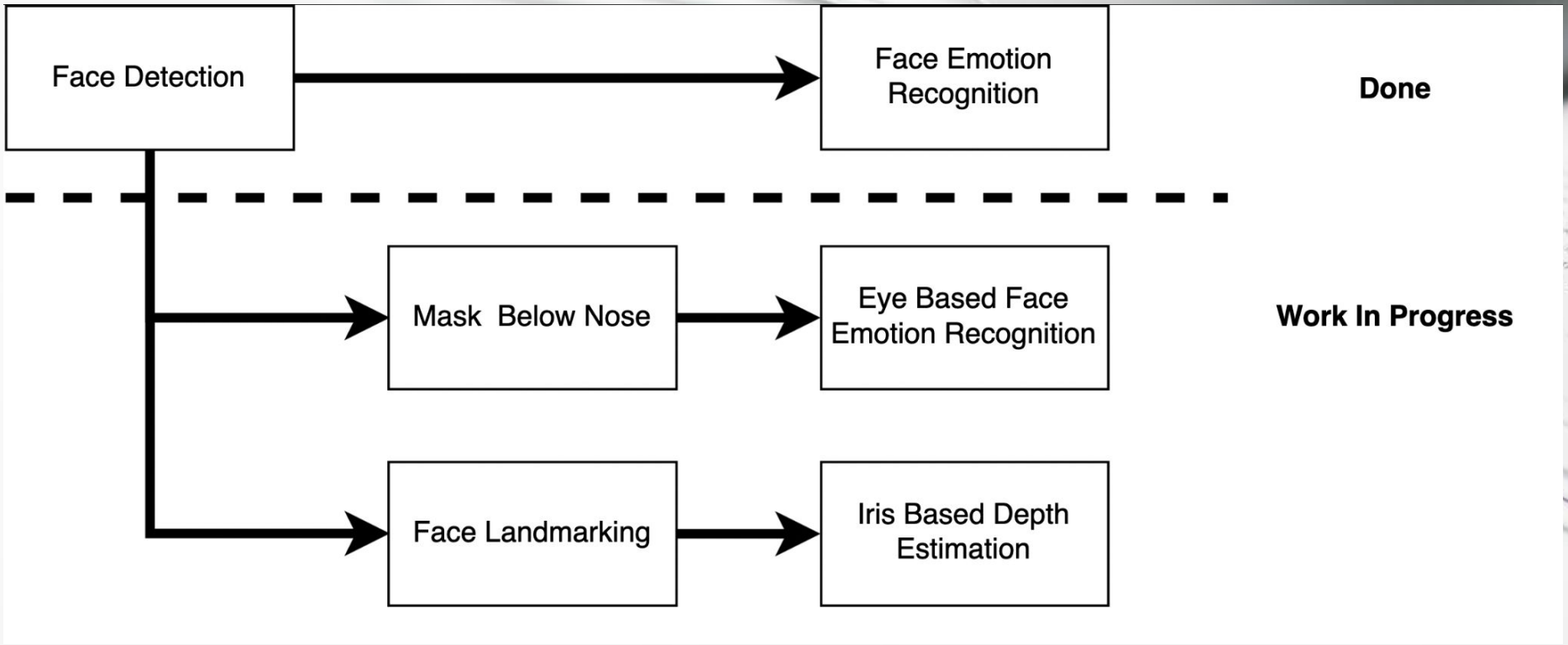
Future Plans

1. Speech-to-Text plan B
    a. Speech recognition is not supported for Unity (iOS)
    b. FYI, if you are using Windows/Hololens, you can check out MTRK
2. Eye Based Face Emotion Recognition (eyeFER)
3. Placing bounding box and objects in the 3D space

Speech-to-Text Pipeline



Unity ML Pipeline

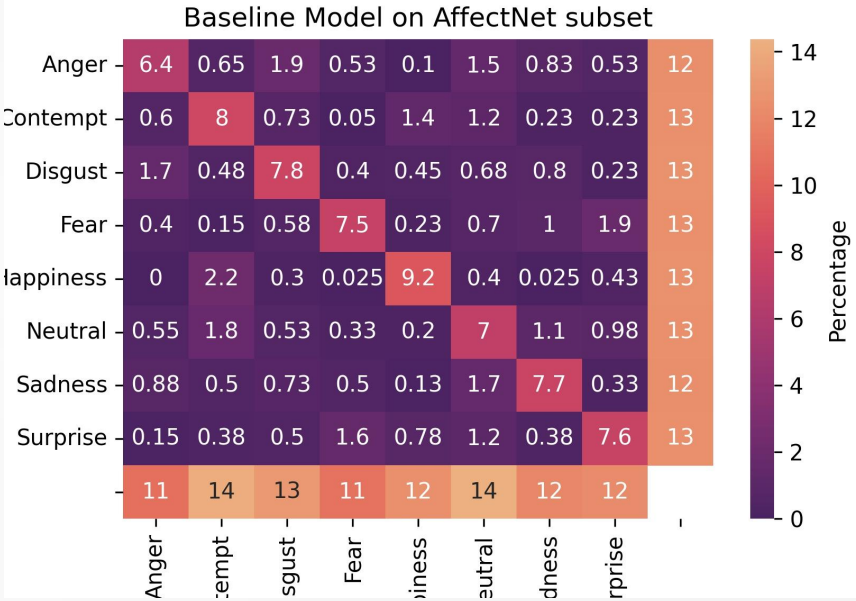


eyeFER (Augmented Affectnet) Dataset

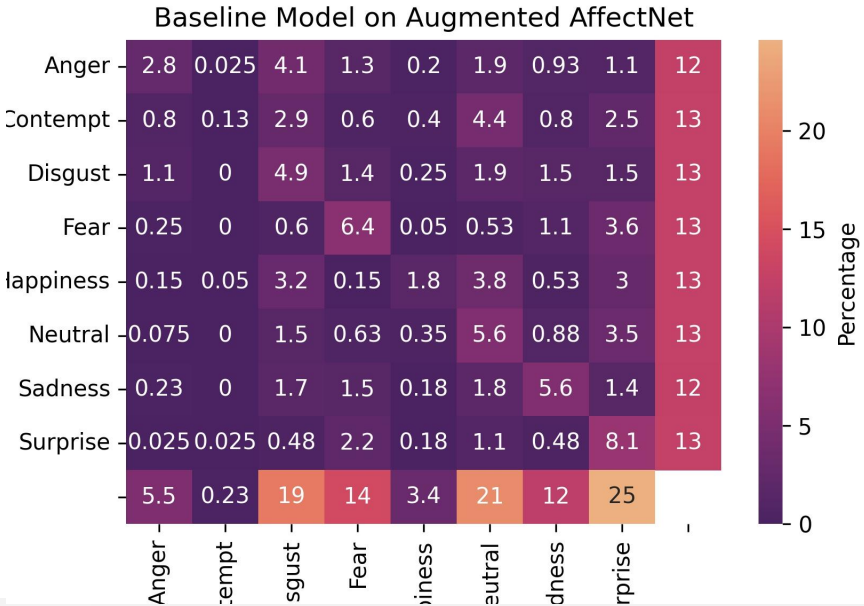
- Train Dataset: 37394 Images
- Validation Dataset: 3987 Images
- Threw out a small percentage of images where landmarking failed
  - Train and Validation had 159 and 13 images removed respectively
  - Some of them were non-face
- **Dataloader code written**
- Next step is to train

For instructor's reference: Dataset Creation can be found in FinalProjectML/affectnet_create_dataset.ipynb

Model Analysis

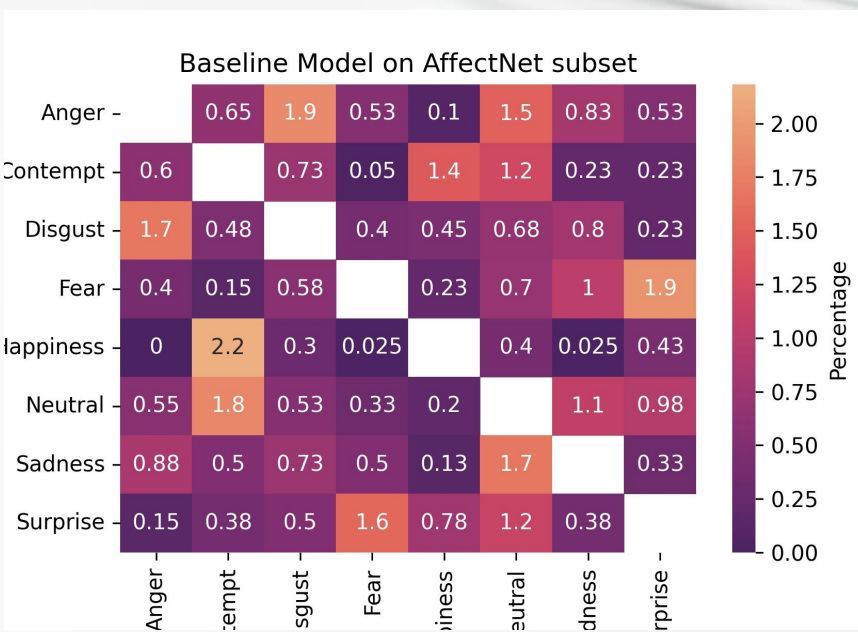


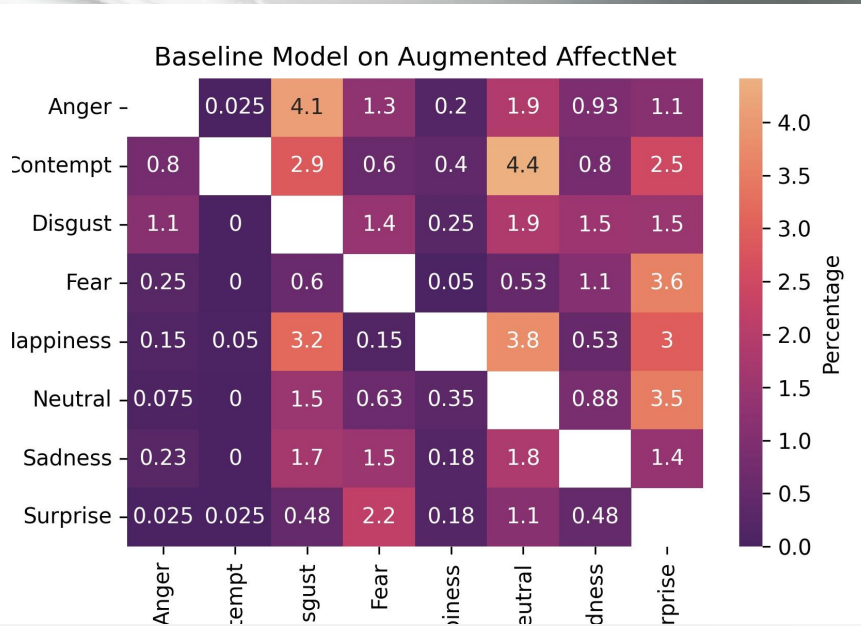
61.30% Accuracy



35.36% Accuracy

Model Analysis





Valence and Arousal

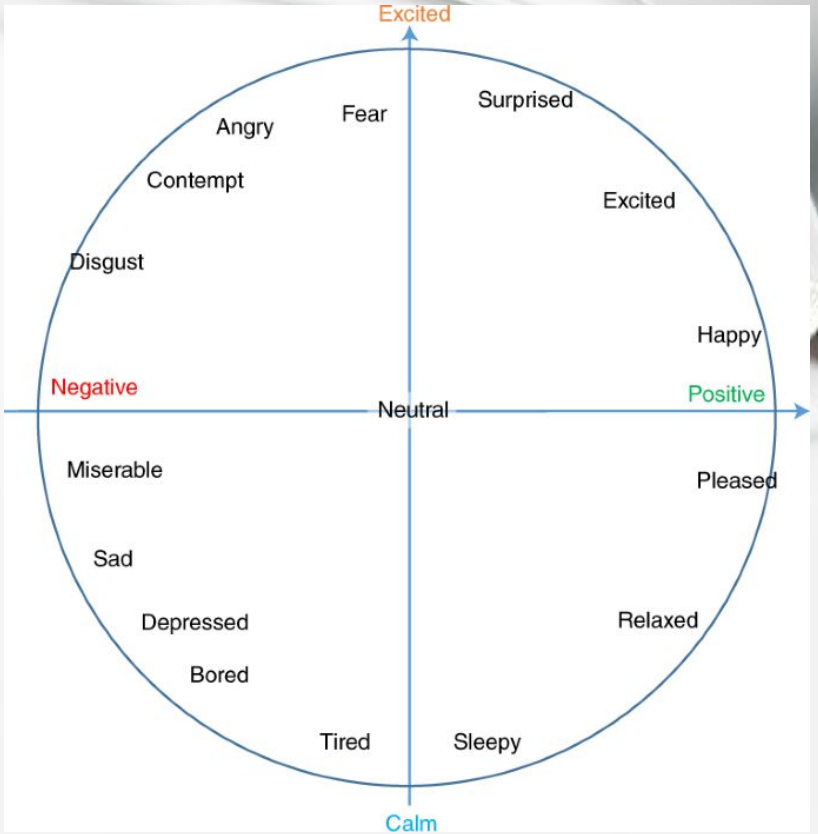


Image Source: https://www.nature.com/articles/s42256-020-00280-0

Iris Based Depth Calculation

- Crop around the iris and get iris landmarks
- Get iris size in pixels
- We know iris real size is around 11.8mm
- If we know the focal length, we can use similar triangles to compute the depth
- **Currently we have successfully measured depth for 1 for face in each frame**

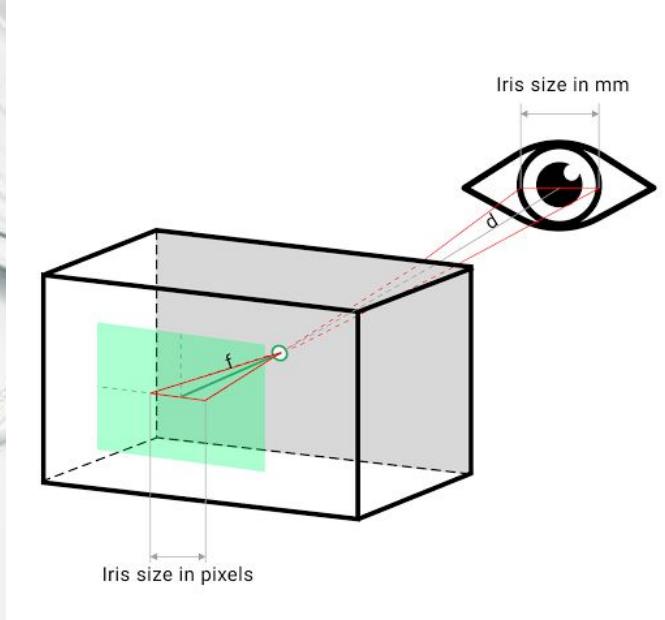


Image Credit: https://ai.googleblog.com/2020/08/mediapipe-iris-real-time-iris-tracking.html


The End