CS696E Progress Update 7

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Problems I’m Working On

- Broadly speaking, problems in the facial recognition domain
  - Clustering of unknown faces to detect similar faces across images
  - Recognizing age from faces to determine kids vs. adults in images

Previously on CS696E….

- Three-class age classification
  - Model classified faces into <=12 years, 13-17 years, and >=18 years
  - High, but very misleading accuracy levels

```
Epoch: 16 Loss: 0.1147
Epoch: 17 Loss: 0.1144
Epoch: 18 Loss: 0.1049
Epoch: 19 Loss: 0.0974
Epoch: 20 Loss: 0.0985
Validation accuracy: 93.3312 Accuracy: 0.9333
Precision <=12: 0.9403 Precision 13-17: 0.3961 Precision >=18: 0.9643
Recall <=12: 0.8599 Recall 13-17: 0.4067 Recall >=18: 0.9765
```

Where I’m At Now [1/2]

- Additional experimentation with three-class classification model
  - Improved the class imbalance situation (by using class weights for the loss function)
  - Manually scraped ~200 images from Google images for the 13-17 class, which yielded ~1200 face images
  - These two tricks helped improve overall performance a bit

```
Validation accuracy: 86.9830 Accuracy: 0.8698
Precision <=12: 0.8982 Precision 13-17: 0.2416 Precision >=18: 0.9784
Recall <=12: 0.8171 Recall 13-17: 0.6733 Recall >=18: 0.8901
Epoch: 21 Loss: 0.2145
```

```
Validation accuracy: 89.1953 Accuracy: 0.8920
Precision <=12: 0.8600 Precision 13-17: 0.2653 Precision >=18: 0.9752
Recall <=12: 0.9050 Recall 13-17: 0.5200 Recall >=18: 0.9117
Epoch: 41 Loss: 0.0826
```

Where I’m At Now [2/2]

- Re-working of all of the code from both projects to have modular functions (so hopefully it’s easier for Jagath to integrate into his Flask API)
  - The face clustering pipeline is now simply calling a series of functions: extract_faces(params) → generate_embeddings(params) → cluster_embeddings(params)
  - Similarly, for age classification: extract_faces(params) → classify_faces(params)
- Usage details all documented on GitHub

What’s Next?

- Extracting backgrounds from images