ASL Gestures - Manifold

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ASL Gesture Classifier

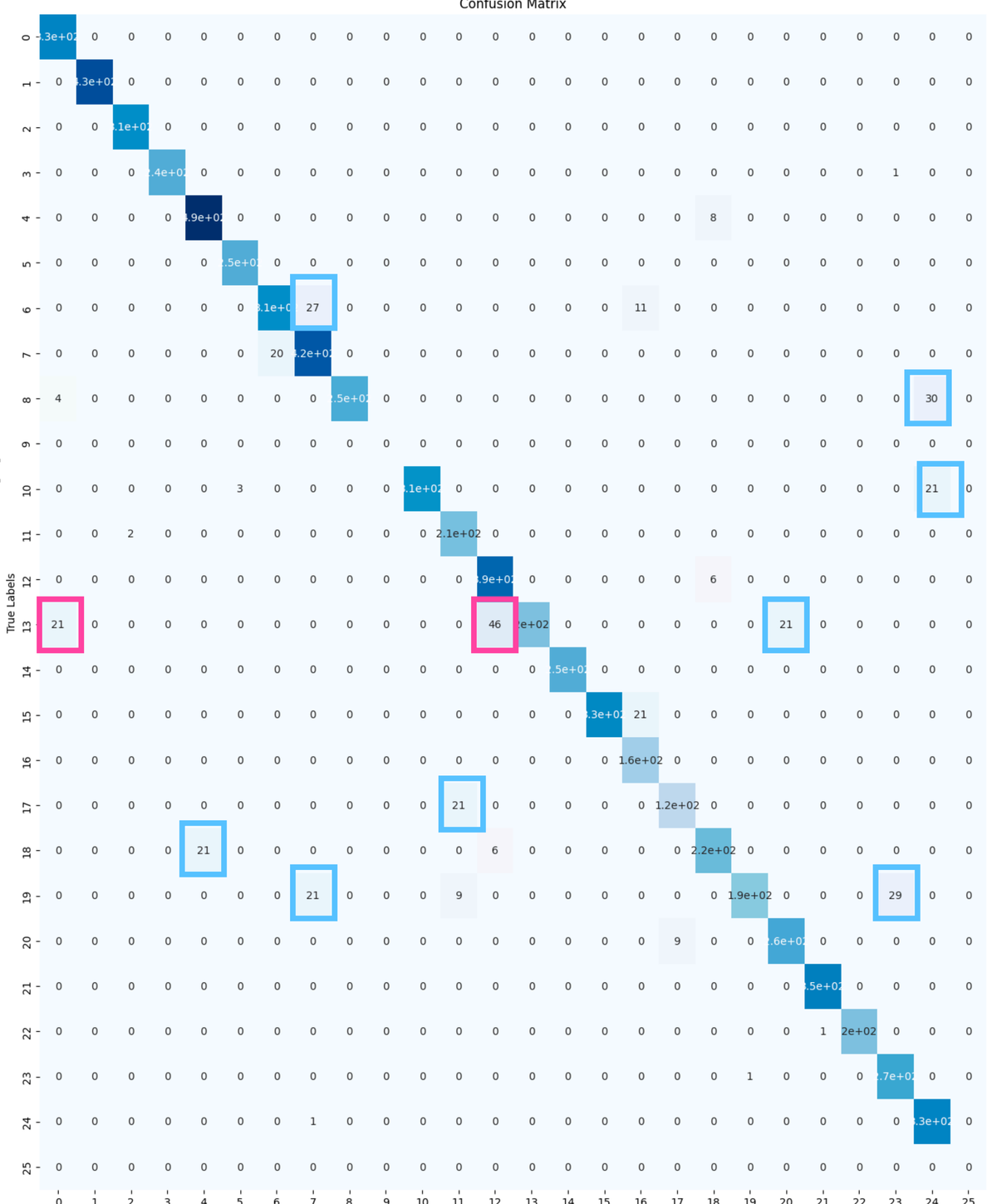
Model architecture:
[conv, relu, pool] x3,
[fc, relu dropout],
fc output layer

94.9% accuracy on test

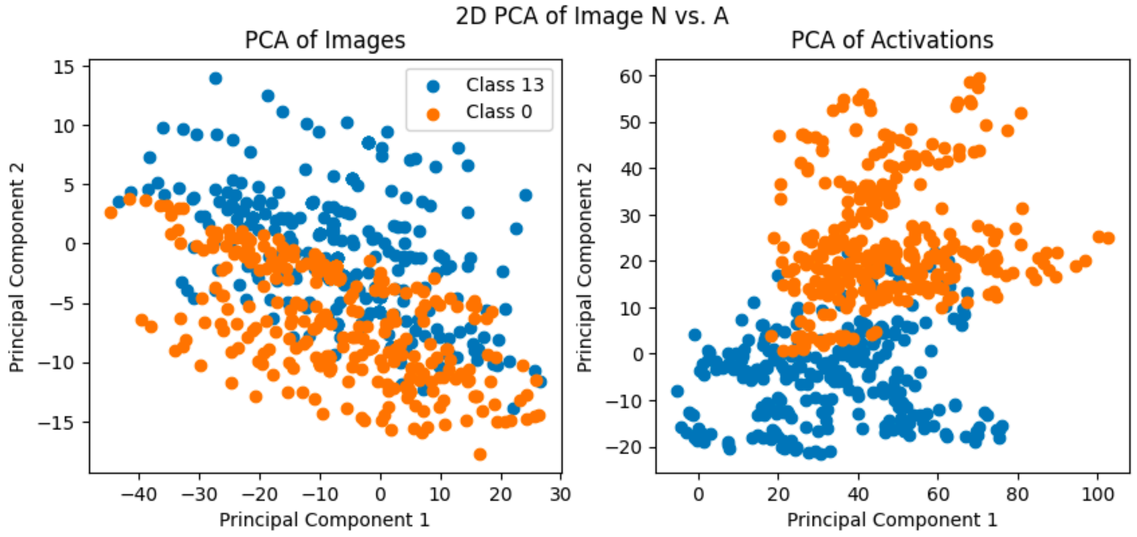
```
data_transforms = transforms.Compose([
    transforms.RandomRotation(15),  # Rotate within [-15, 15] degrees
    transforms.ColorJitter(brightness=0.3, contrast=0.3, saturation=0.3),
    transforms.RandomResizedCrop(28, scale=(0.85, 1.15)),  # For 28x28 input size
    transforms.RandomAffine(degrees=0, translate=(0.15, 0.15)),
    transforms.RandomHorizontalFlip(p=0.5),
    transforms.ToTensor(),
])
```

Some gestures are similar - from the manifold view:

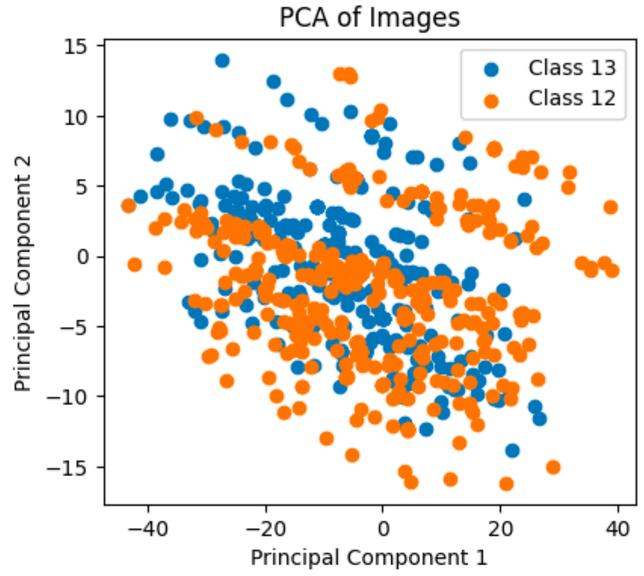
1. See if visually similar gestures often get confused?
2. Do they have similar components computationally?
3. Do they activate the model in similar ways?
4. Do similar gestures have increasingly overlapping components?

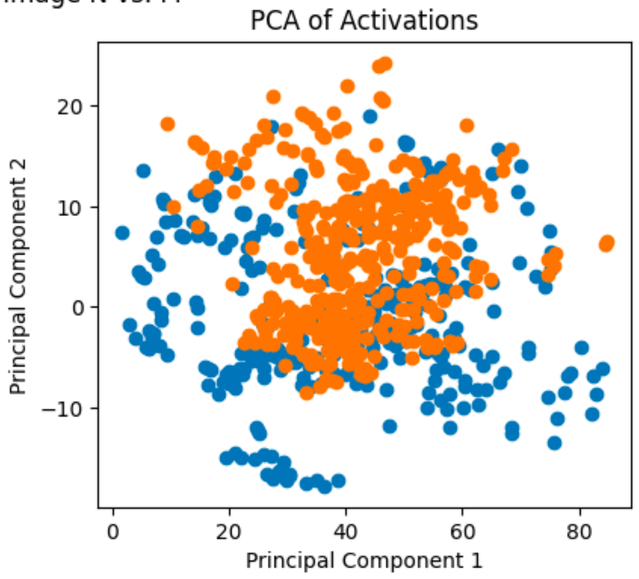


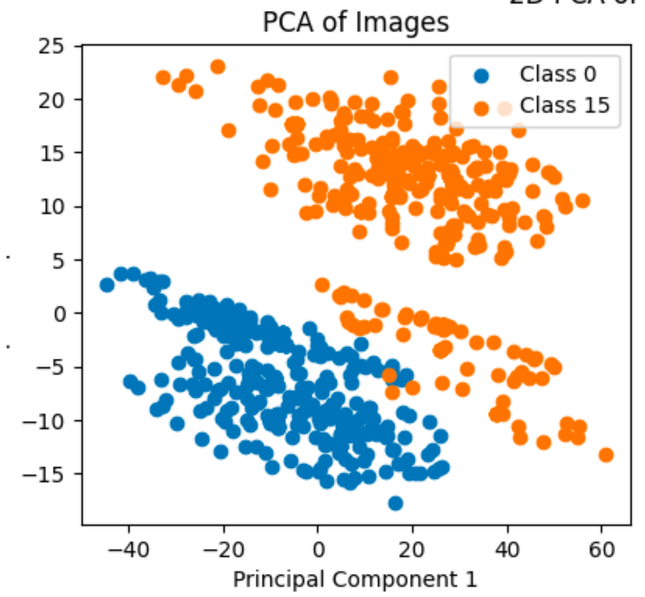
PCA Analysis - All Classes PCA - Manifold

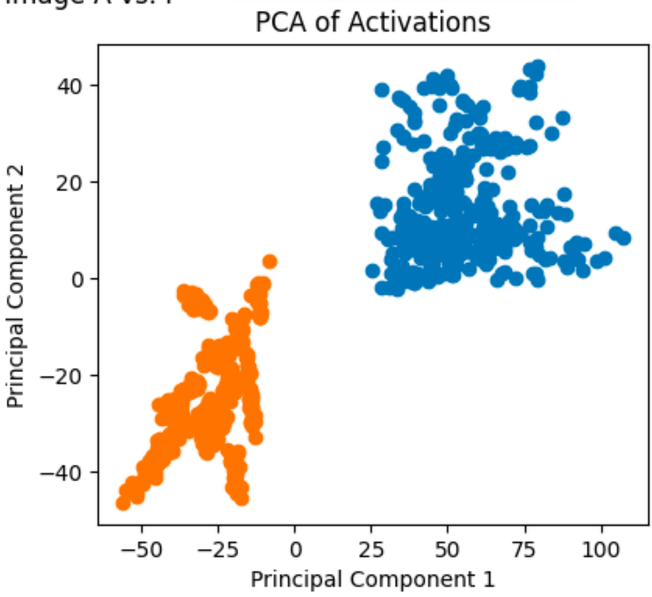


No similarity example

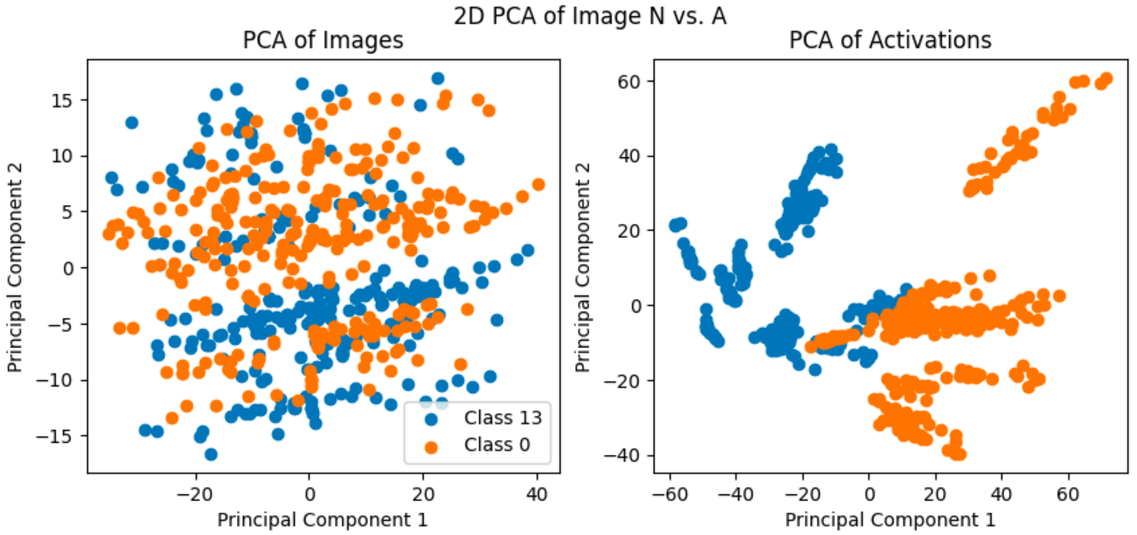


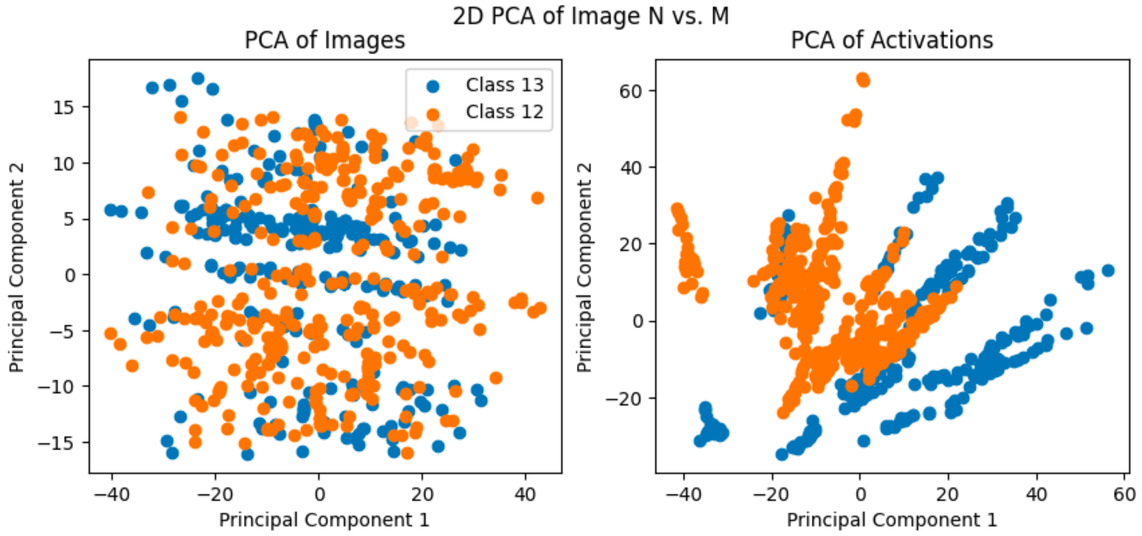




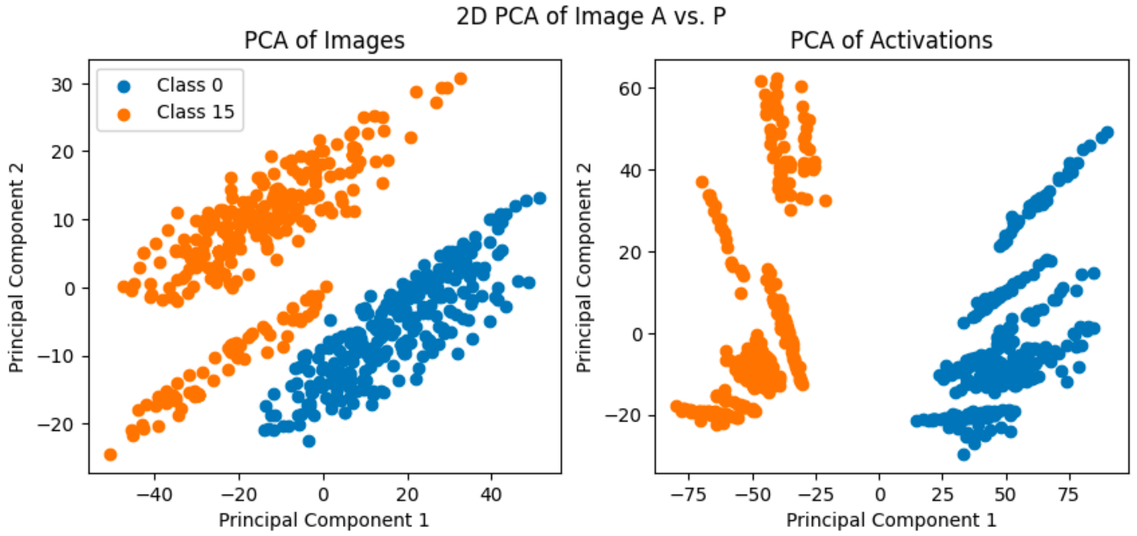


PCA Analysis - Pairwise PCA - Manifold





No similarity example



PCA Analysis - Group PCA - Manifold

As the gestures get less and less similar, the activations' and images' PCA also start to have less overlap