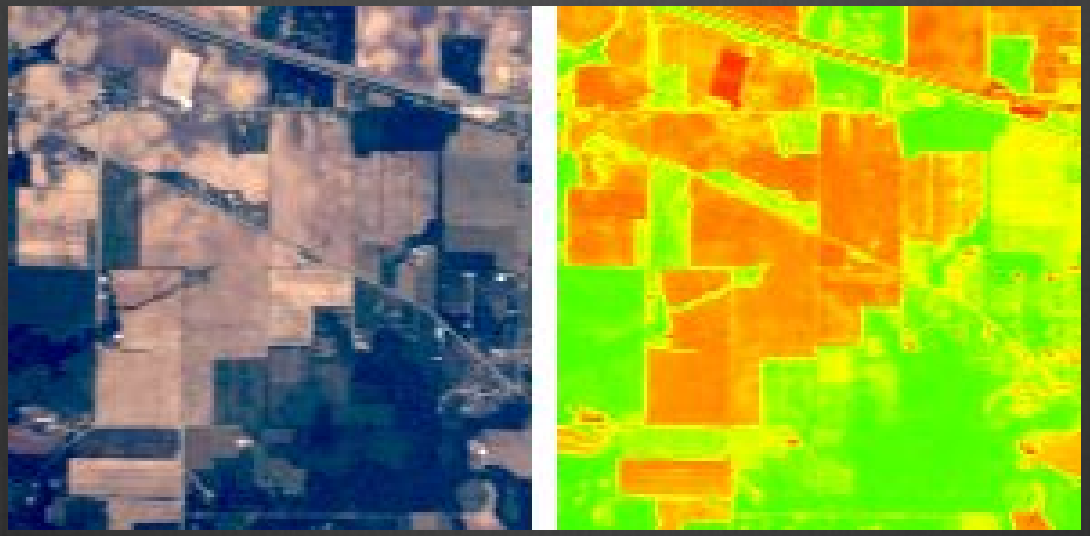
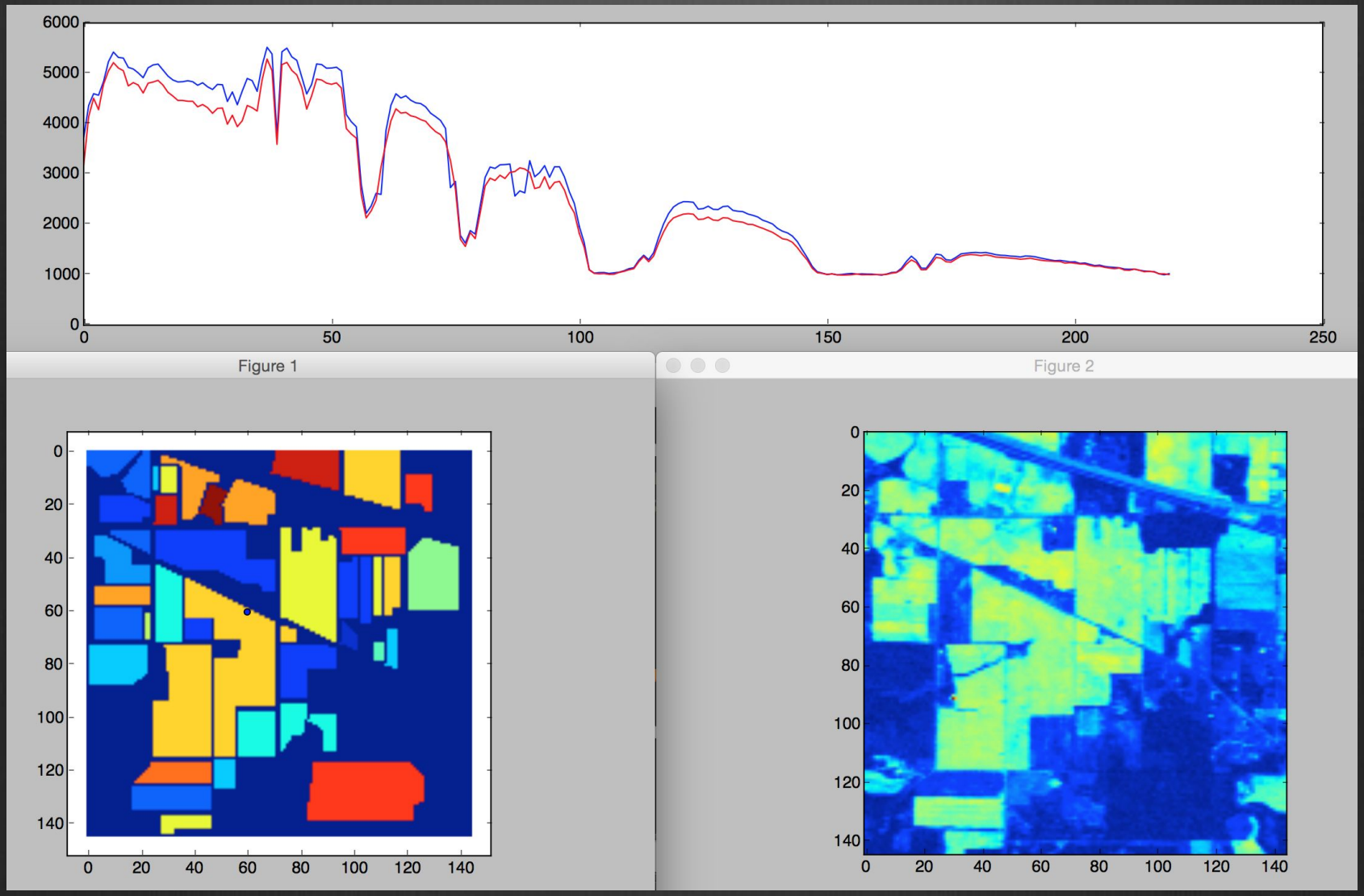
Spectral Weighting and Spatial Biasing for Hyperspectral K-Means Clustering

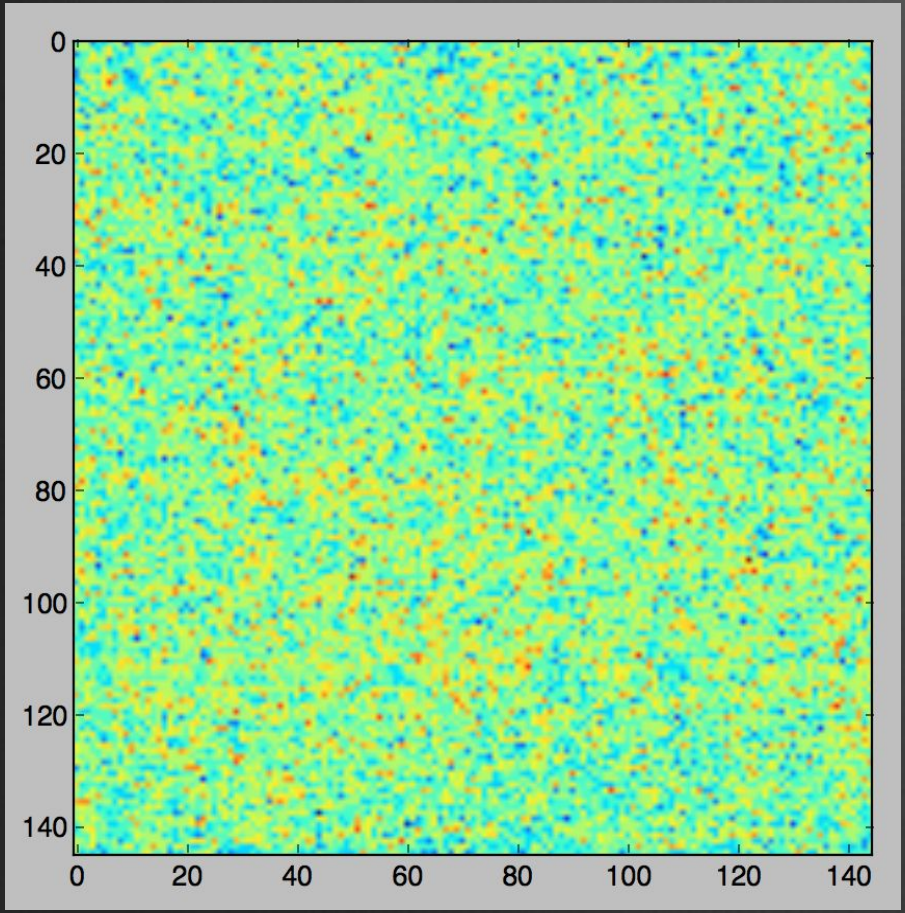


Daniel Hanson, Sam Kreter
Brendan Marsh, Christina Mosnick

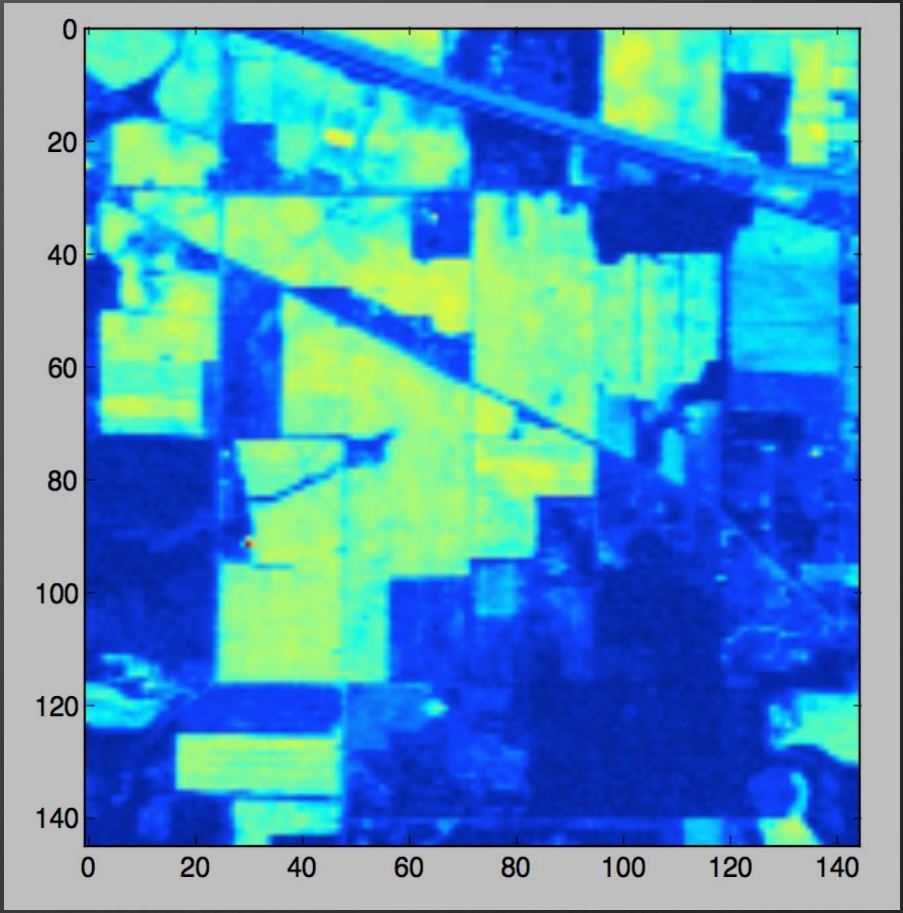
Know Your Data



The Data



band 150



band 167

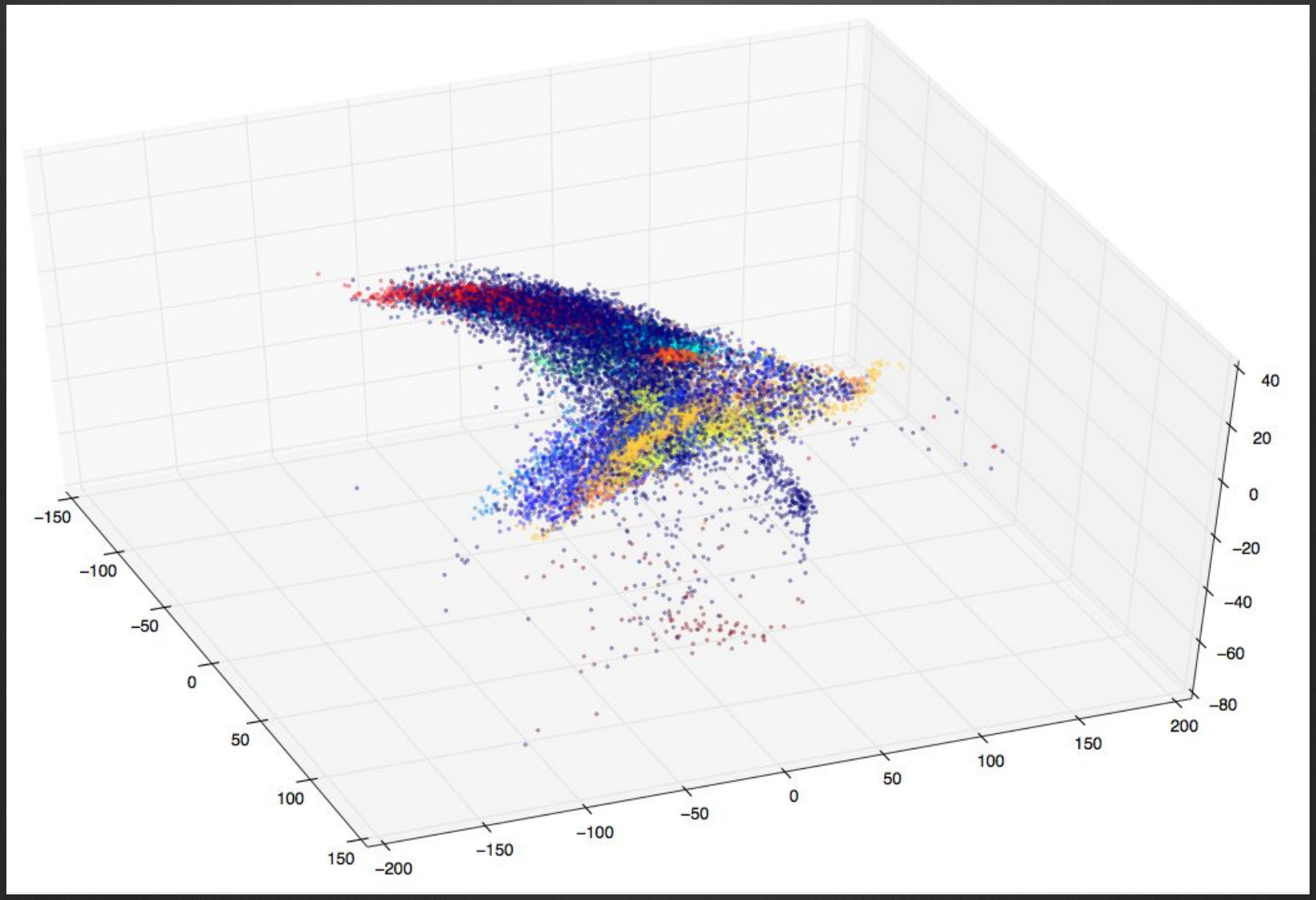
Why K-Means?

- Tried DBSCAN and Soft K-Means
- Known Number of Clusters

Normalized K-Means

- Normalize all spectral bands by .001
- Choose appropriate bands to weight more heavily
- Add weighted X and Y coords into dataset
- Run Scikit-learn K-means

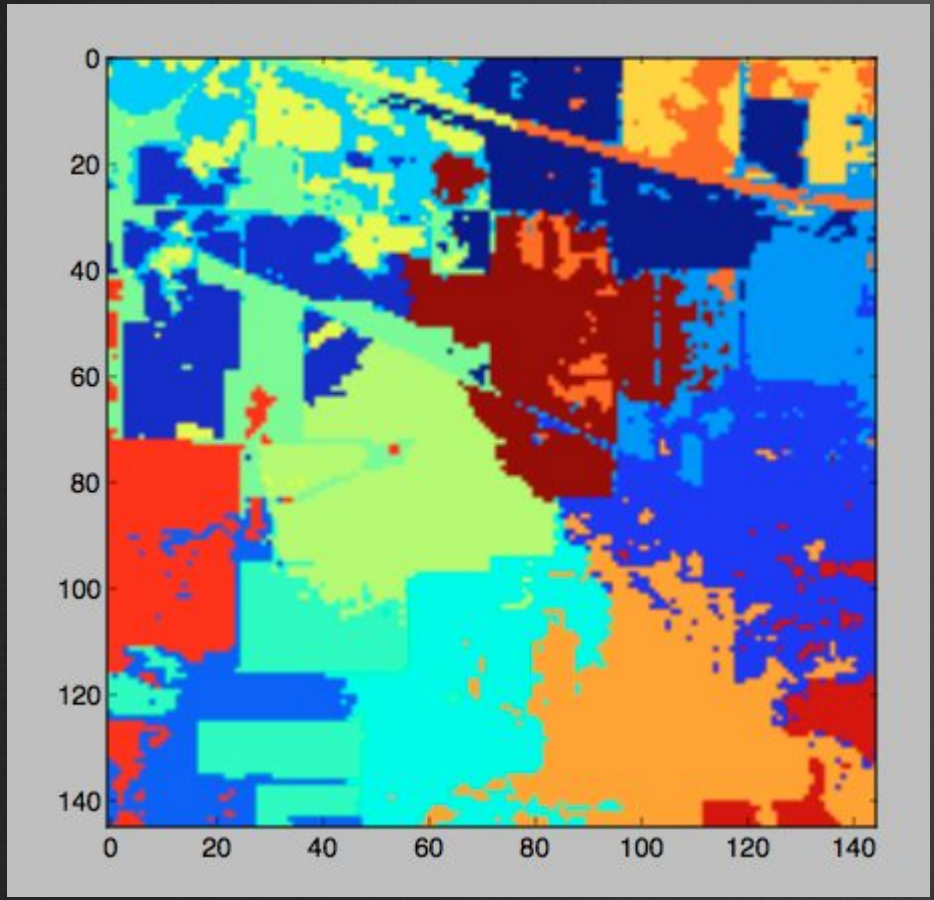
PCA Projection Into Three Dimensions

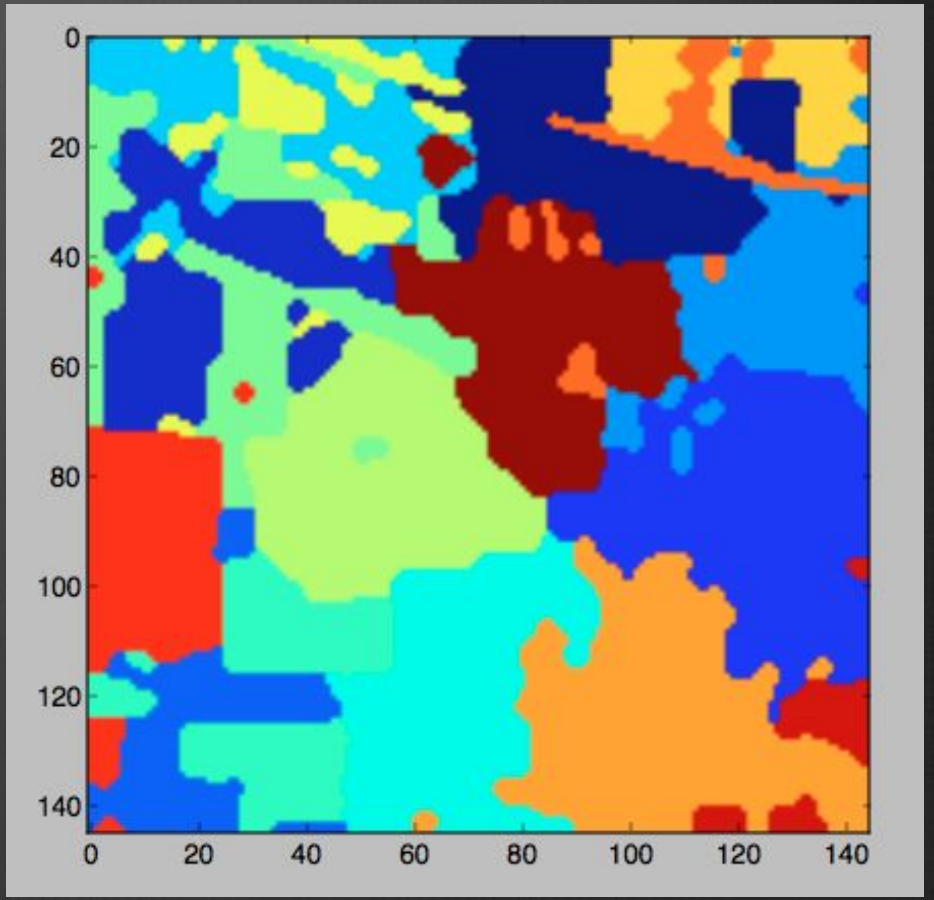


Neighborhood Bias

- Spatially close points are spectrally similar
- Uses ‘majority vote’ approach
- Smooths out local inconsistencies

Neighborhood Bias





Results

- Weighting of Spectral Layers
- Selection of Spectral Images

Final Rand Index

0.886272 :)