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Intro to Connectomics
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SynChallenge: Automatic Image Detection of Synapses

The original provided code used the *homogeneity* of the grey-level co-occurrence matrix as a feature for the random forest classifier to create decision trees (with *n_estimators=200*). The f1 score for the original code was 0.77. I further added the *contrast*, *energy* and *correlation* functions of the grey-level co-occurrence matrix as features. In addition, I calculated the number of blobs using the Difference of Gaussian (DOG) method (*blob_dog* method) and changed the *min_sigma* to 0.5 to identify smaller blobs. I also calculated the number of local maximum peaks (*peak_local_max* method). I also modified the random tree classifier to have use a *n_estimators* of 300, which increased the number of trees in the forest, and set the *max_features* to 'None'. Furthermore, I set the *min_samples_split* to 10, which increased the minimum number of samples required to split an internal node, and increased the minimum number of samples for each node to 5. The f1 score increased to have a default f1 score of 0.82, while the best validation f1 score is 0.83 at a 0.45 threshold.