

Project – Cell Detection

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Abstract

The aim of this project is to detect cells in an image by convolution neural network (CNN). CNN can be regarded as a fully-convolved classifier to detect the center of cells in the whole image by sliding window. After which, non-max suppression is utilized to keep pixels with maximum possibility. In the project, 321,985 patches are extracted from 30 training images, and 10 validation images provide 116,338 patches. 10 test images* are remained to make an evaluation on performance of classification. Data augmentation is used on the positive samples by applying rotations and color modifications in the HSV color space. Unlike positive samples, negative samples are abundant to be accessed. After training the CNN, the model gives an average relative error of 6.3% over test set. In general, the trained net has good capability to detect target cells. However, non-goal cells can be detected in some cases. Also, the trained net is too sensitive to small objects close to image boundaries.

* It should be the secret test set, but I have no idea of the number of images in test set since it's secret.