Recognition of living and dead cells for automated cell sorting

Abstract: In this work we present an image classifier for classifying images of biological cells into living or dead cells, taken by the single-cell printer, a device developed by the company Cytena. We explore two architectures for the model of the classifier; VGG-16 and MobileNet and compare their performance. We then introduce a few approaches to solving the low image resolution problem for the input data and forcing higher penalty for mislabeling dead cells as viable. We also present experiments where we test various scenarios to increase the precision. Finally, we take a deeper look at the sensitivity maps of a sample of the misclassified cells to understand and analyze how the decision process is made.