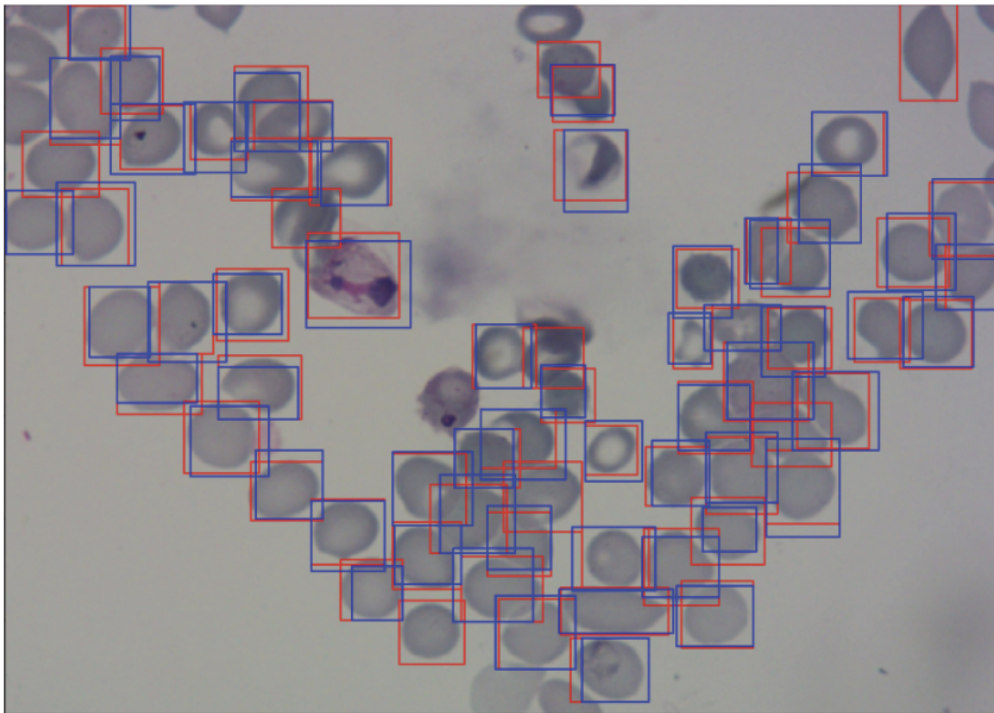Cell segmentation with computer vision

I summarize what people have done with machine learning in cell detection/counting/segmentation.

Keras R-CNN

Keras R-CNN is based on the Faster Region-based Convolutional Neural Network (Faster R-CNN) architecture. Faster R-CNN takes an image as input and generates bounding boxes and bounding box classifications.

 Example of malaria-infected human blood smear. Red boxes are ground truth; blue boxes are predictions by Keras R-CNN.

It does not do pixel segmentation.

Code: https://github.com/broadinstitute/keras-rcnn

Facebook's detectron2

Facebook's state-of-art object detection and segmentation algorithms. It is the successor of Detectron and maskrcnn-benchmar.

Code: https://github.com/facebookresearch/detectron2

Tensorflow's object detection API

Object detection

Code: https://github.com/tensorflow/models/tree/master/research/object_detection

U-Net

Cell detection

Project homepage: https://lmb.informatik.uni-freiburg.de/resources/opensource/unet/

DeepCell

Deep CNN used in cell segmentation

Code: https://github.com/CovertLab/DeepCell

DCAN

Cell segmentation in histology images

Code not available

Less favorable

Deep watershed

Deep watershed transform for Instance segmentation

Code not available

Retinanet

An advanced one-stage object detector

Code: https://github.com/facebookresearch/Detectron

PointINS

One stage instance segmentation

Code not available

FCOS
Code: https://github.com/tianzhi0549/FCOS/

CenterMask
Code: https://github.com/youngwanLEE/CenterMask

YOLACT
Code: https://github.com/dbolya/yolact

GAN
Code: https://github.com/faisalml/NucleiSegmentation

Embedding

StarDist
Code: https://github.com/stardist/stardist

TensorMask (under Facebook detectron2)

ApaptIS
Given an input image and a point (x,y), it generates a mask for the object located at (x,y)
Code: https://github.com/saic-vul/adaptis

CondInst
Code: https://github.com/aim-uofa/AdelaiDet