

End of sprint presentation  
3

# Goals

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1

Explore neural  
network  
architectures

2

Explore more image  
segmentation  
networks

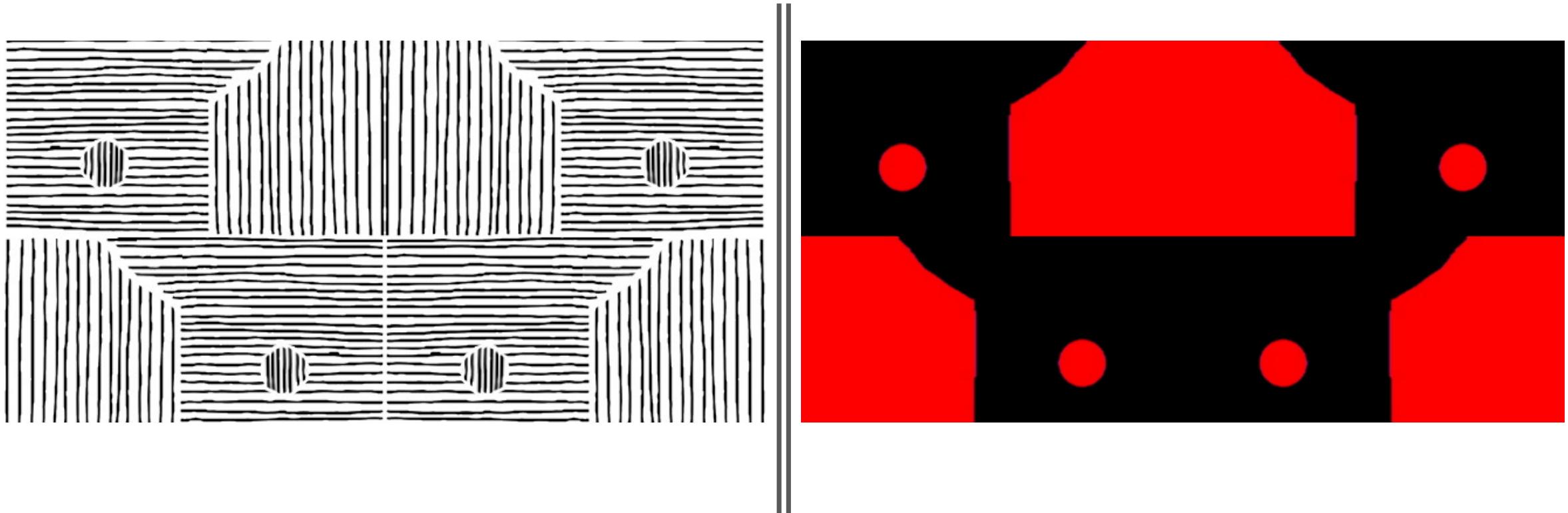
3

Build on our existing  
models adding extra  
features

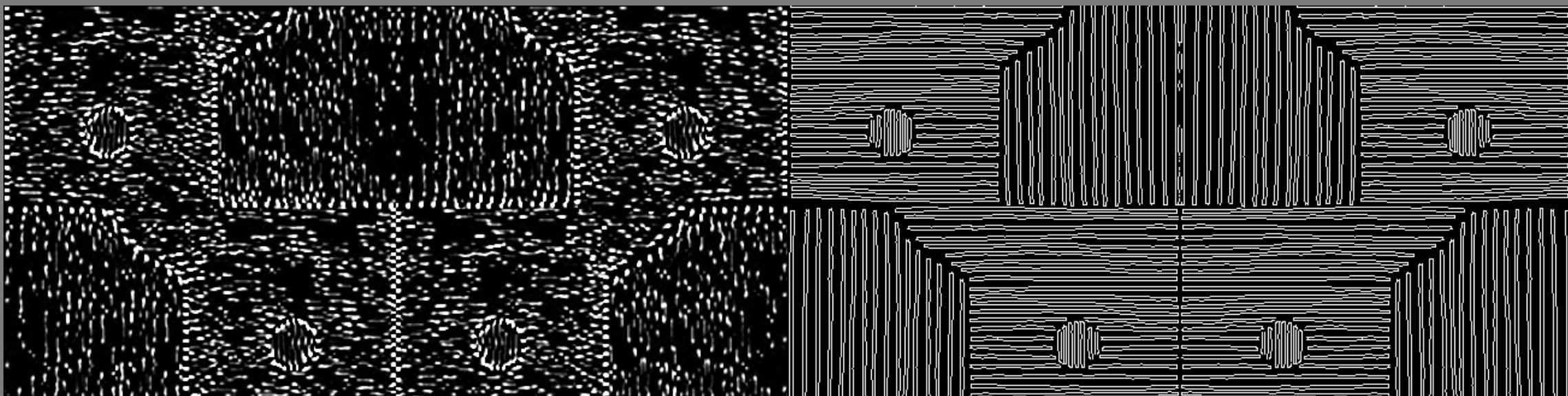
# Striped dataset

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## Input



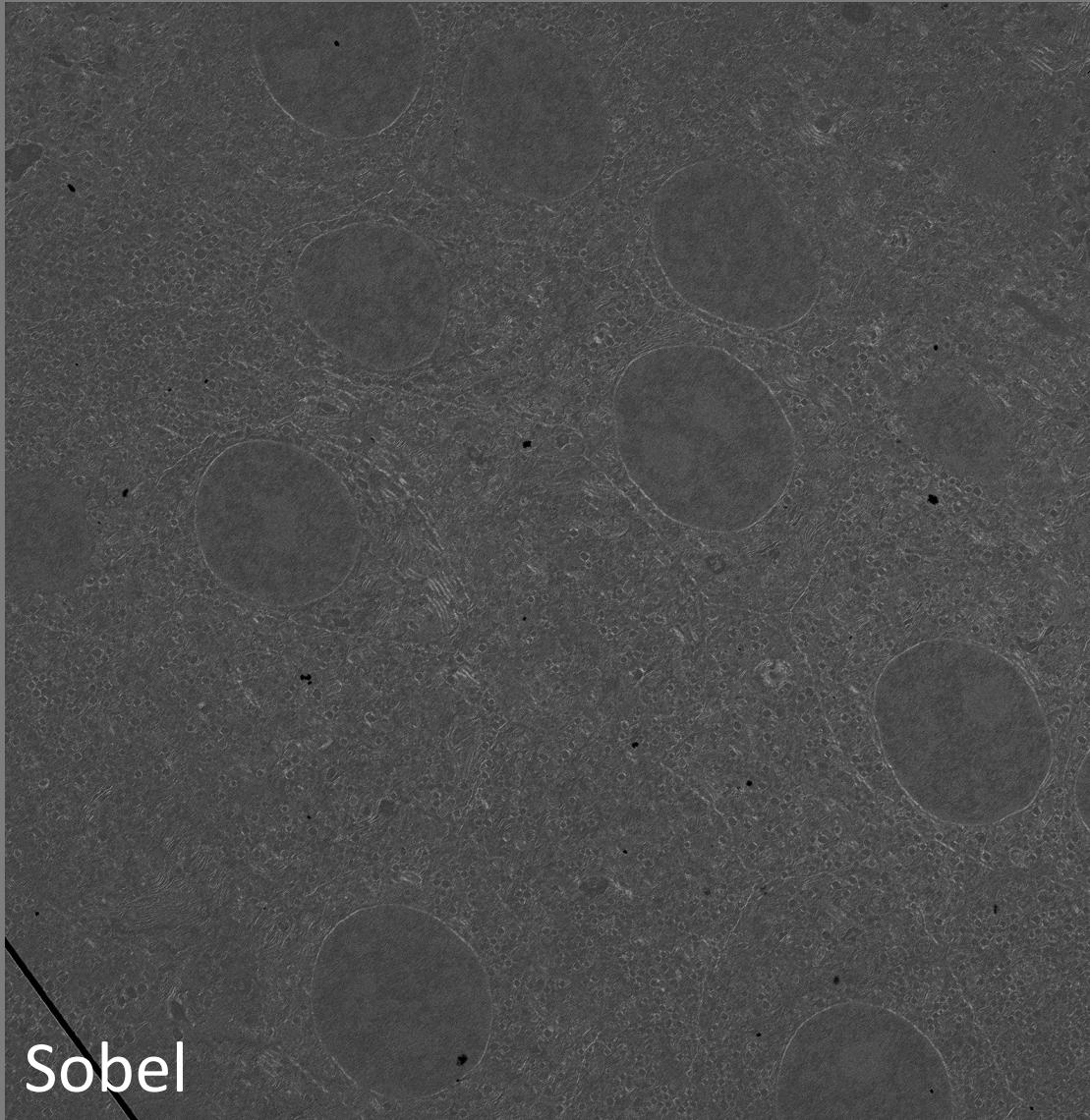
# Edge detection



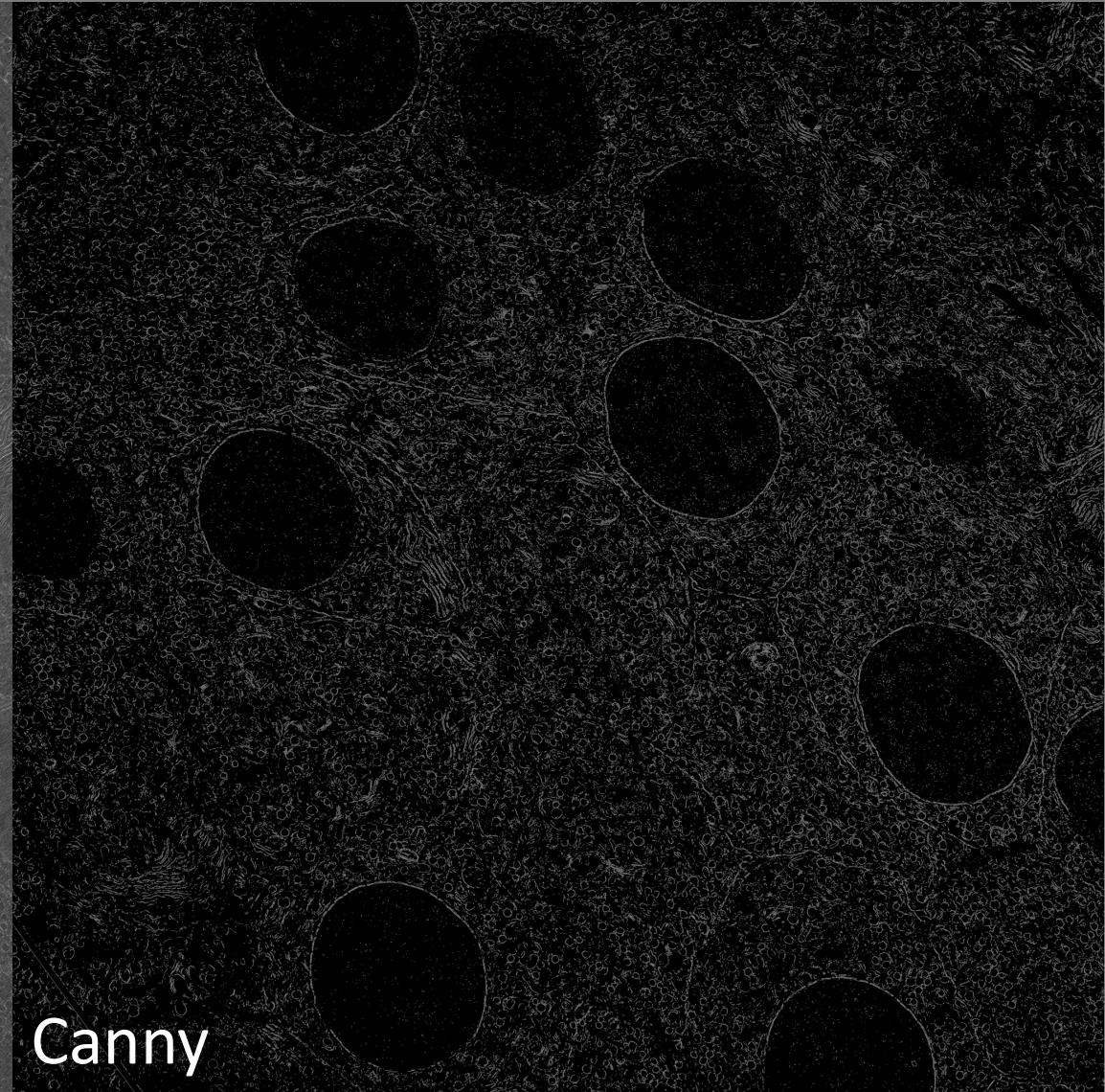
Sobel

Canny

# Edge detection on cellular images



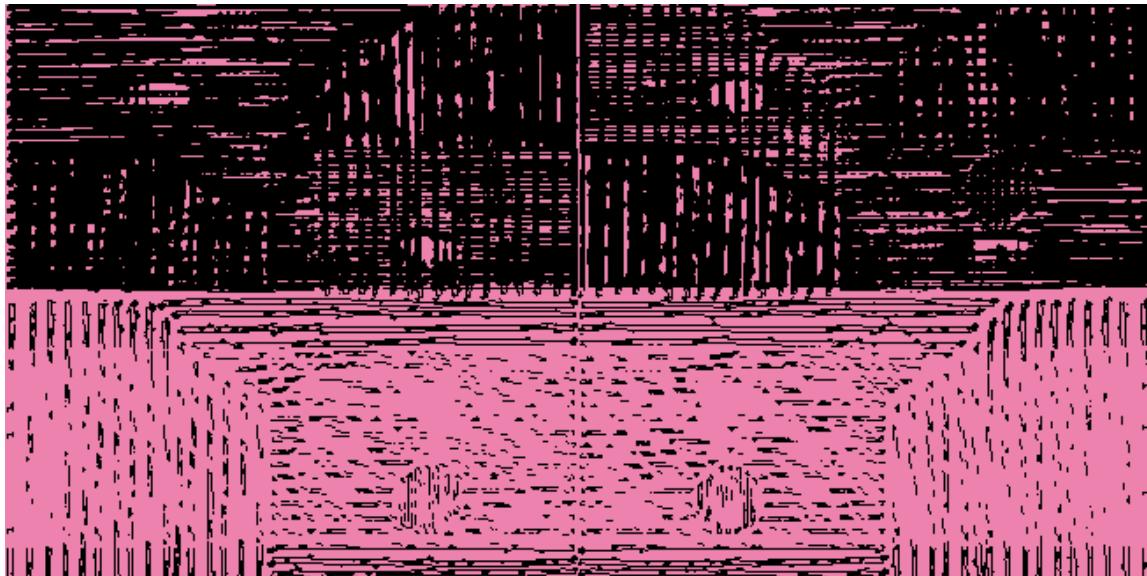
Sobel



Canny

# Striped dataset

## Output



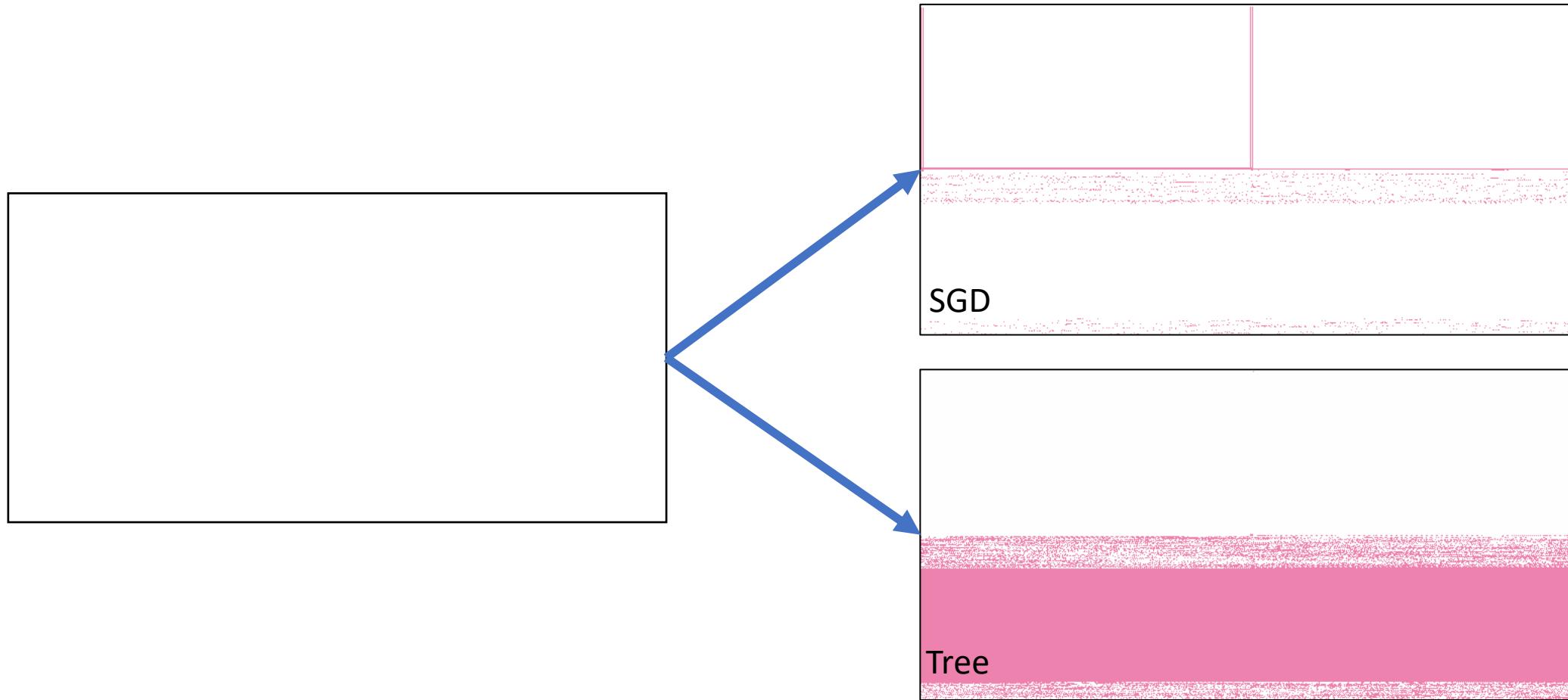
First results: full\_MultinomialNB



Expected

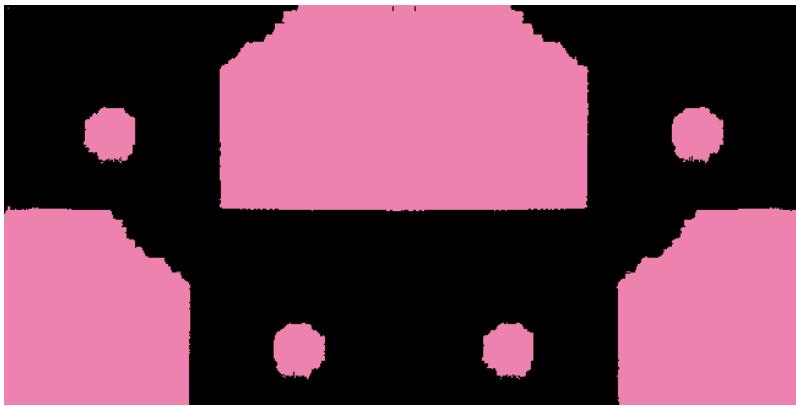
# Striped dataset

## Bugs

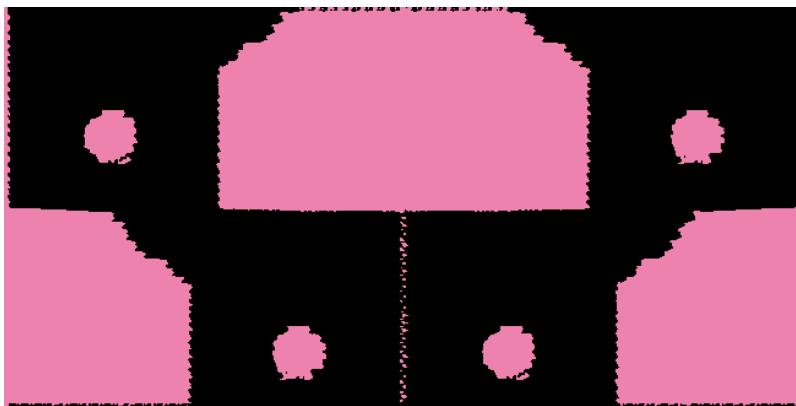


# Striped dataset

## Output



SVM 70% dataset



SVM pixel subset

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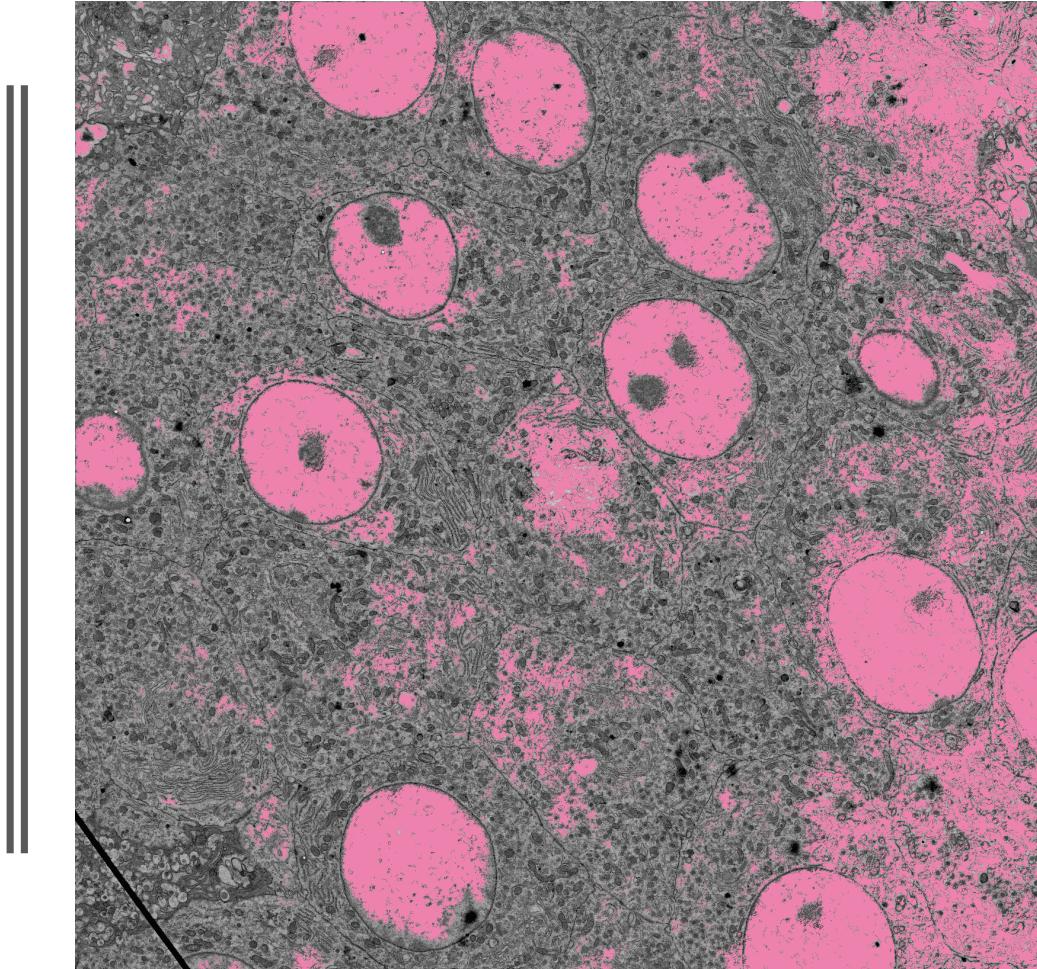
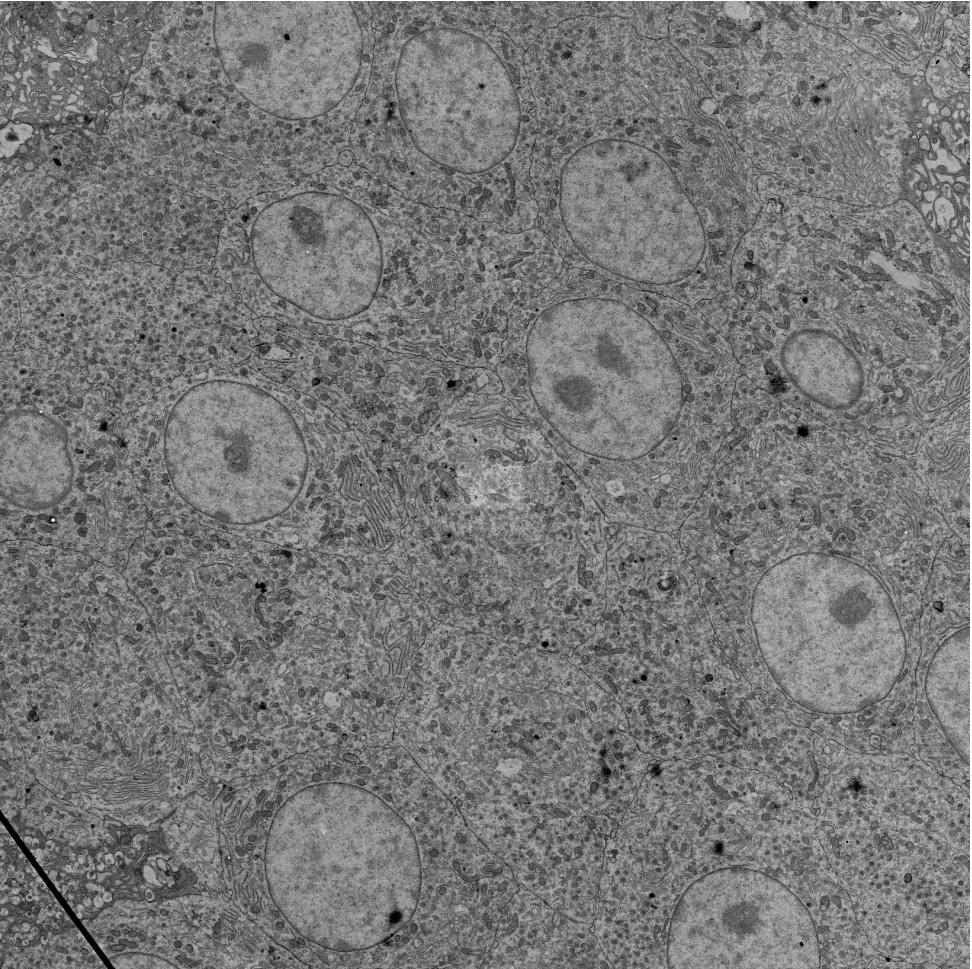
Expected



# SVM

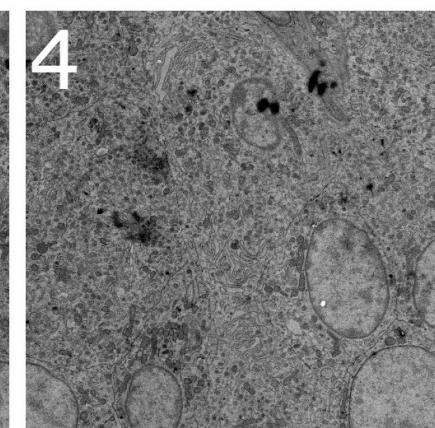
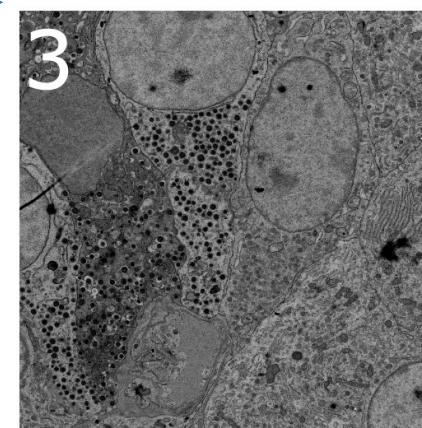
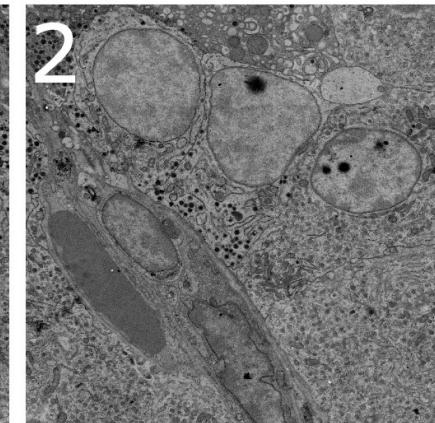
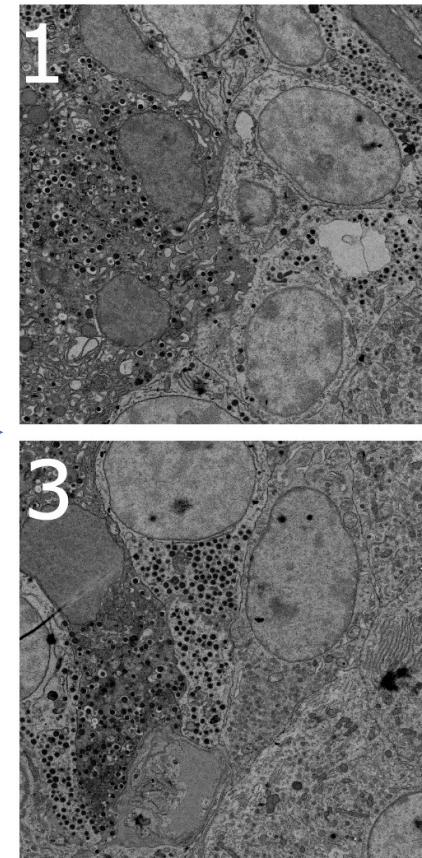
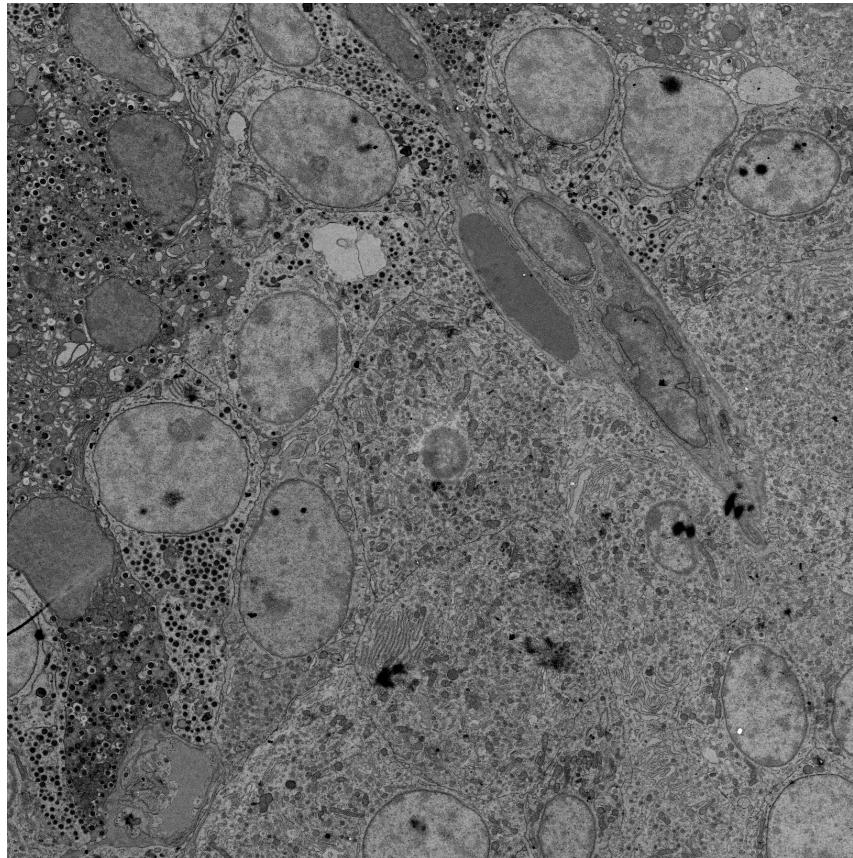
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# Output



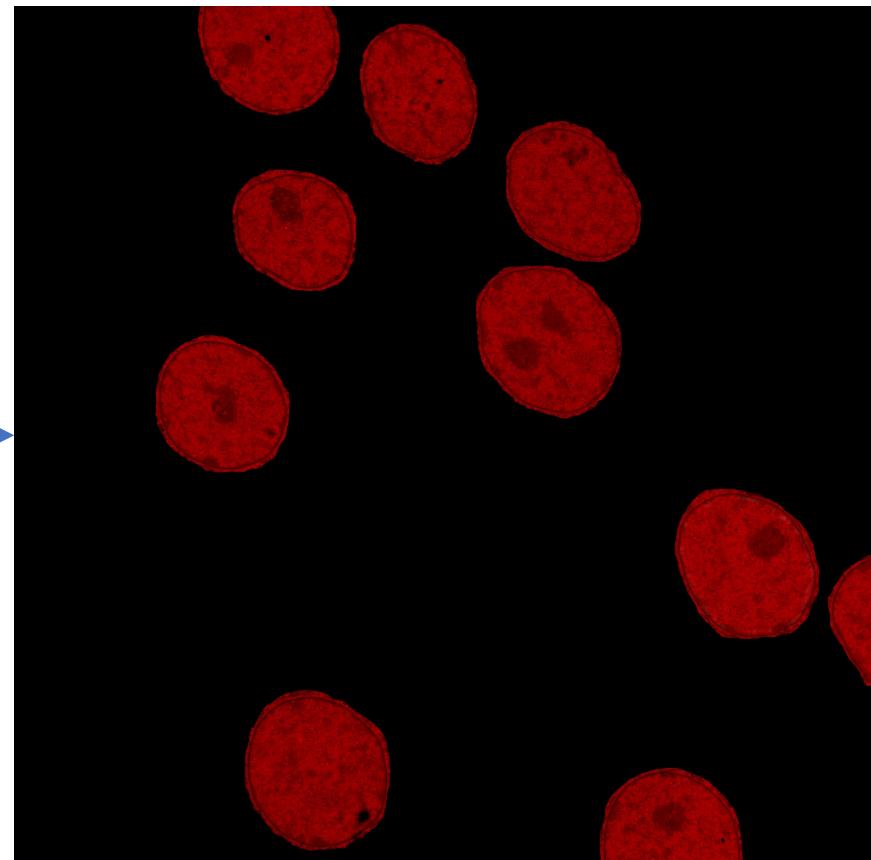
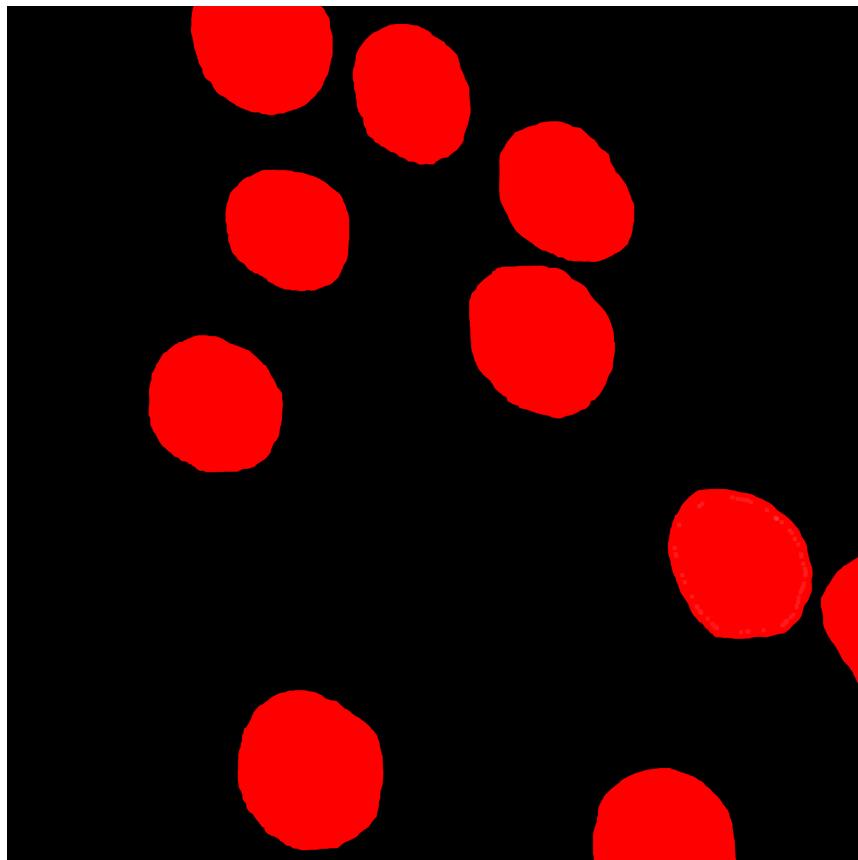
# Tool development

## Image partitioner



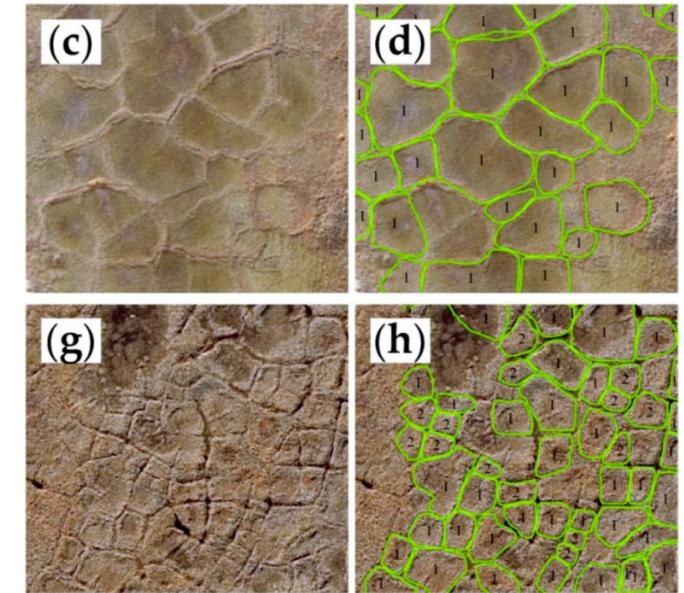
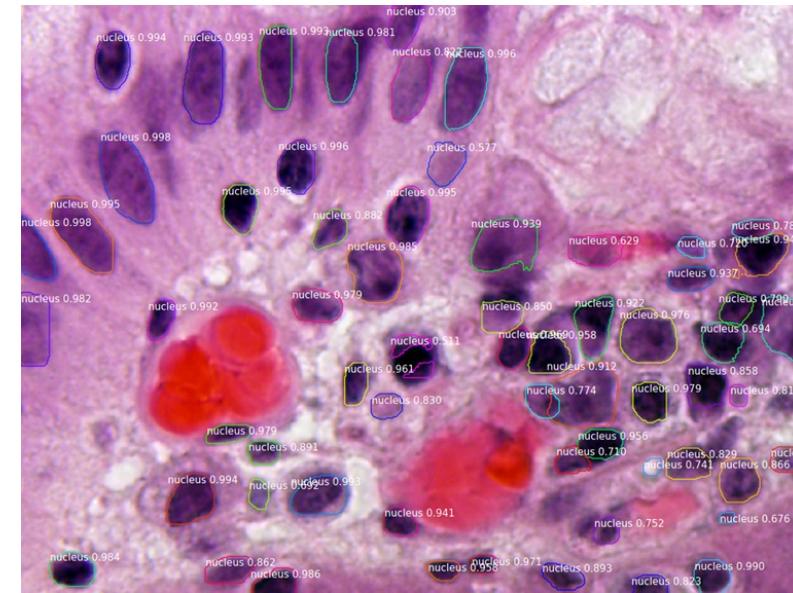
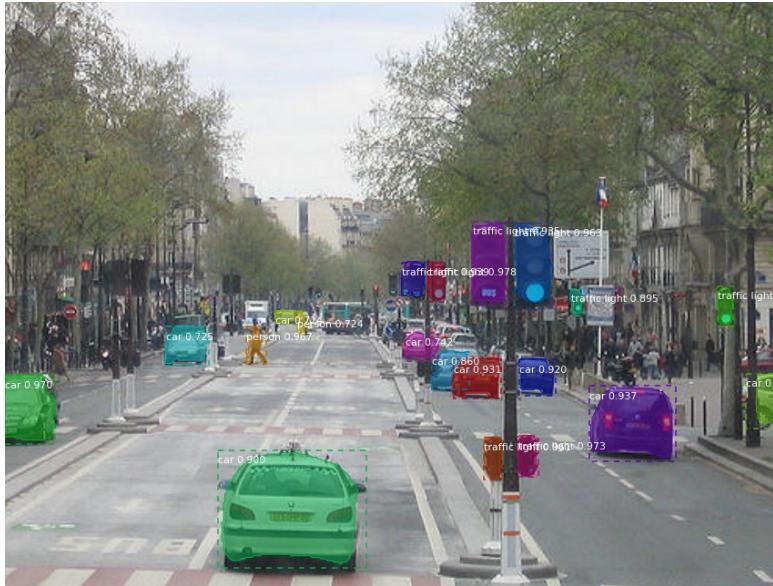
# Tool development

## Image dilation



# Tool development

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[https://github.com/matterport/Mask\\_RCNN](https://github.com/matterport/Mask_RCNN)

# Tool development

## Implementation of mask r-cnn

- Faster development
- Better results
- Pretrained on COCO (200.000+ images) dataset

- Uses Tensorflow 1 which requires Python versions < 3.4.
- Documentation is lacking
- Converting to Tensorflow 2 would require too much time

# TensorFlow

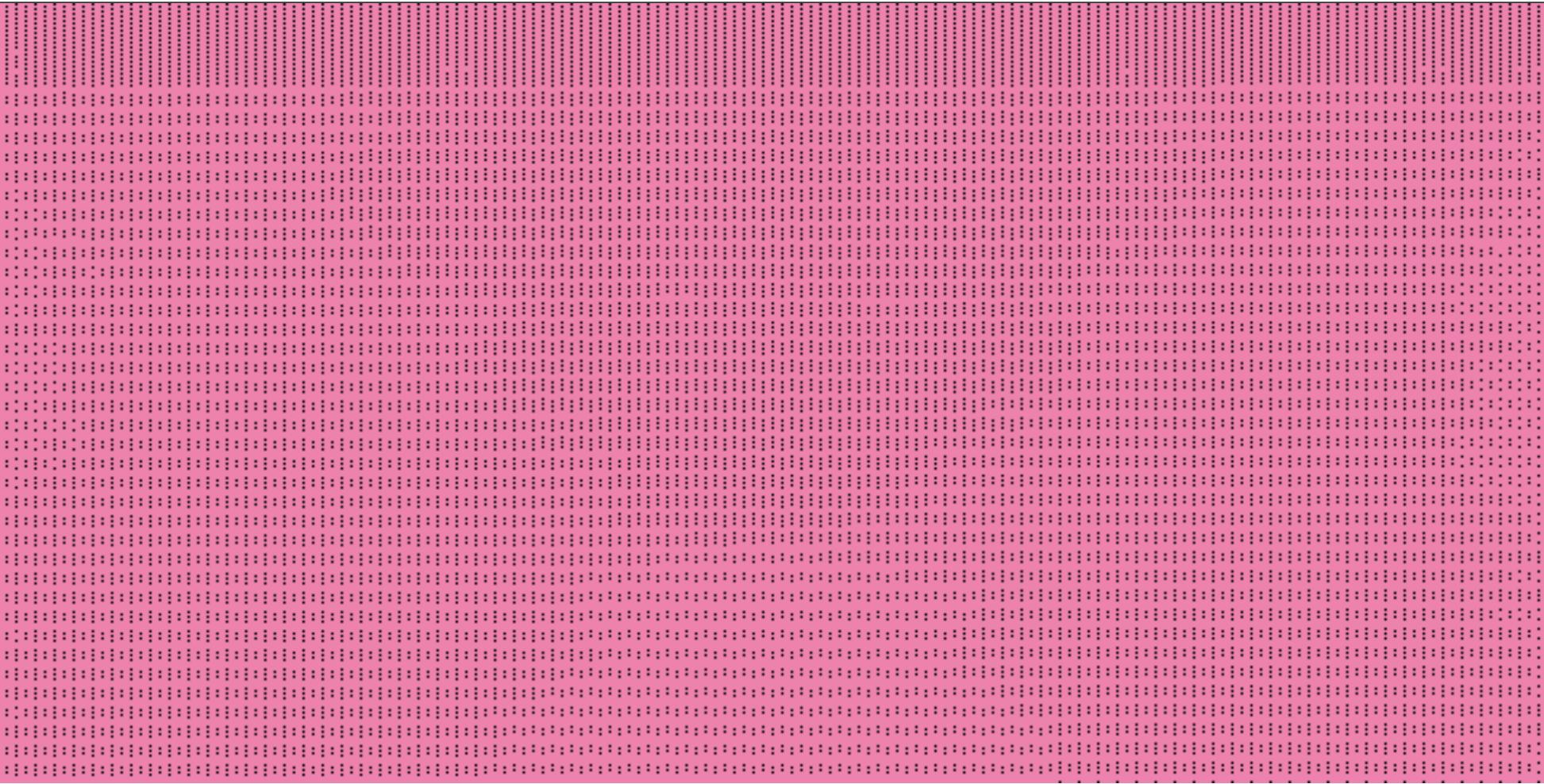
```
Fit model on training data
Epoch 1/10
4982/4982 [=====] - 16s 3ms/step - loss: 0.2142 - accuracy: 0.9224
Epoch 2/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1560 - accuracy: 0.9519
Epoch 3/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1578 - accuracy: 0.9511
Epoch 4/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1387 - accuracy: 0.9594
Epoch 5/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1459 - accuracy: 0.9554
Epoch 6/10
4982/4982 [=====] - 14s 3ms/step - loss: 0.1304 - accuracy: 0.9617
Epoch 7/10
4982/4982 [=====] - 14s 3ms/step - loss: 0.1328 - accuracy: 0.9609
Epoch 8/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1394 - accuracy: 0.9581
Epoch 9/10
4982/4982 [=====] - 14s 3ms/step - loss: 0.1291 - accuracy: 0.9626
Epoch 10/10
4982/4982 [=====] - 15s 3ms/step - loss: 0.1271 - accuracy: 0.9639
Evaluate on test data
355/355 [=====] - 1s 2ms/step - loss: 0.1152 - accuracy: 0.9683
test loss, test acc: [0.11517580598592758, 0.9682713150978088]
```

```
Model: "sequential"
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Layer (type)          Output Shape       Param #
=====
dense (Dense)         (None, 128)        14080
dropout (Dropout)     (None, 128)        0
dense_1 (Dense)       (None, 128)        16512
dense_2 (Dense)       (None, 64)         8256
dense_3 (Dense)       (None, 32)         2080
dense_4 (Dense)       (None, 2)          66
=====
Total params: 40,994
Trainable params: 40,994
Non-trainable params: 0
```

# TensorFlow

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## Output



# Future goals



Improving neural networks



Improve SVM