

Level 4 Project

Week 5/18

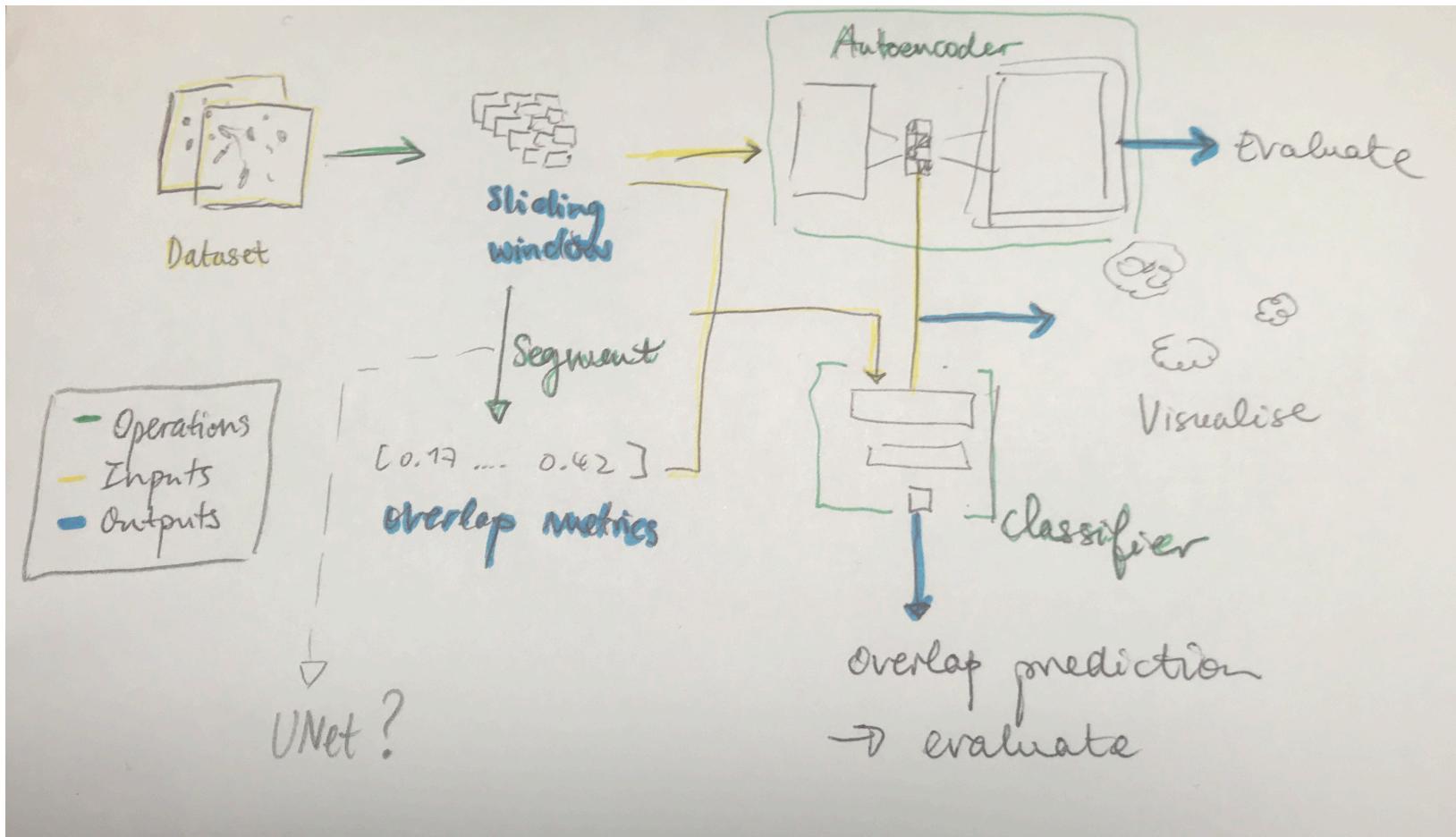
Schedule for weeks 5-6 (18-19)

- Investigate how to use the masks obtained in UNet
- Make a classifier
- Get weights from autoencoder trained on masked dataset
 - Got the CK19 weights too
- Start evaluating and saving figures in a dedicated folder

UNet

- Not sure where it fits in

System diagram



Classifier from the encoder

```
[ ] classifier = Sequential()
classifier.add(encoder)
classifier.add(Dense(128, activation='relu'))
classifier.add(Dense(4, activation='softmax'))
```

```
[ ] classifier.summary()
```

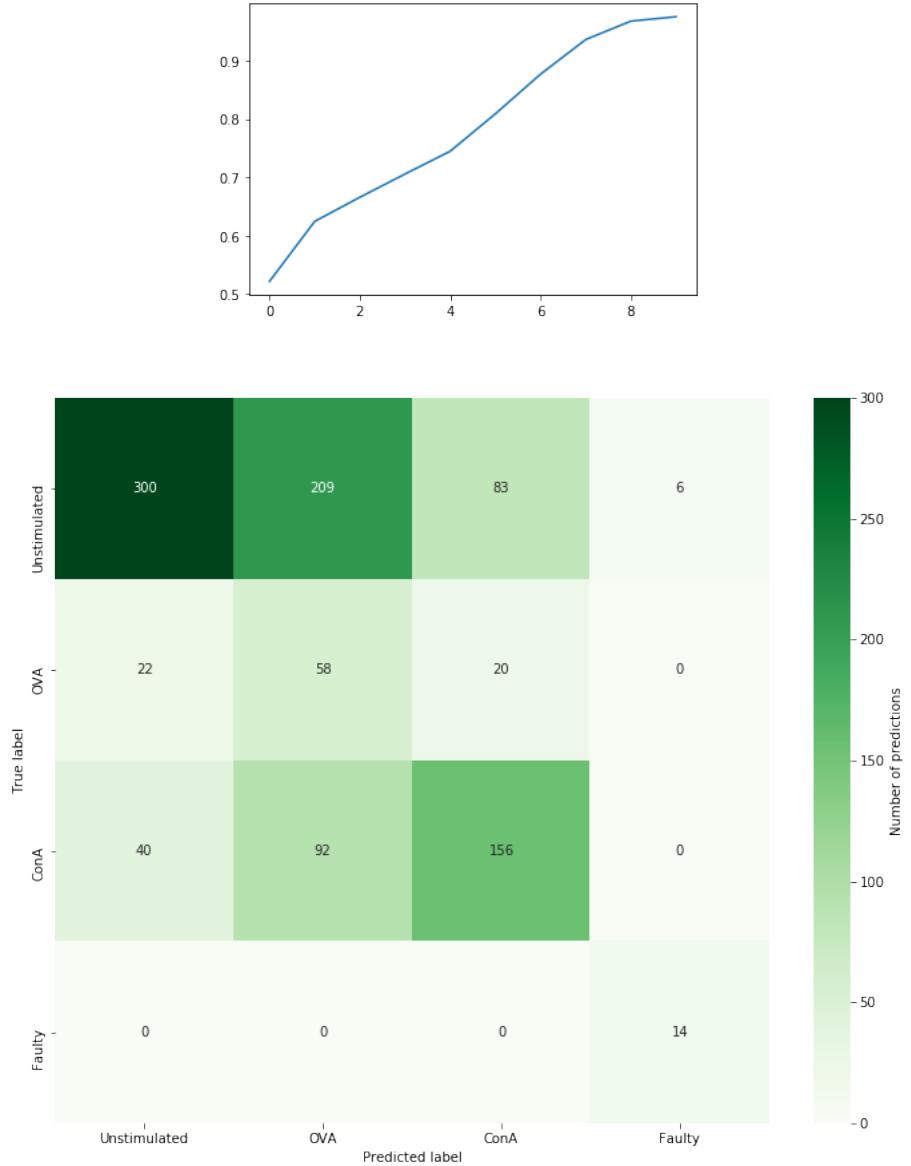
↳ Model: "sequential"

Layer (type)	Output Shape	Param #
=====		
model_2 (Model)	(None, 2304)	2764368
dense (Dense)	(None, 128)	295040
dense_1 (Dense)	(None, 4)	516
=====		
Total params: 3,059,924		
Trainable params: 3,059,924		
Non-trainable params: 0		

```
[ ] classifier.compile(loss='categorical_crossentropy',
                      optimizer='adam',
                      metrics=['accuracy'])
```

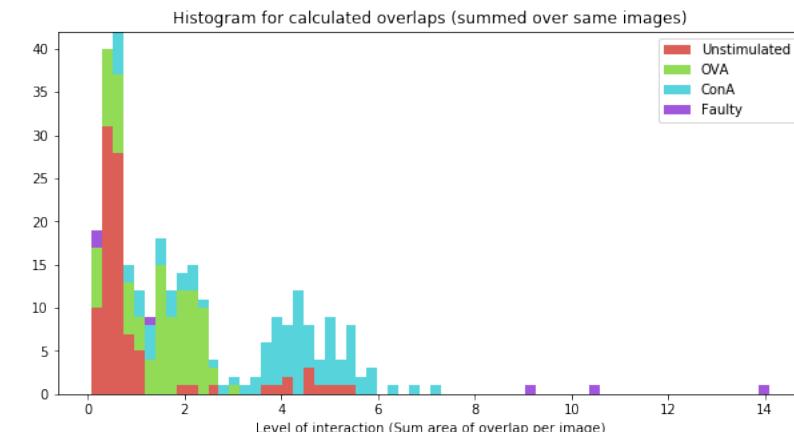
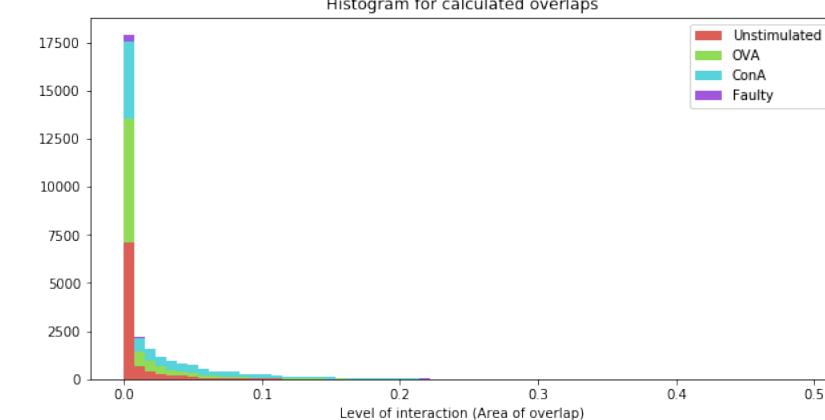
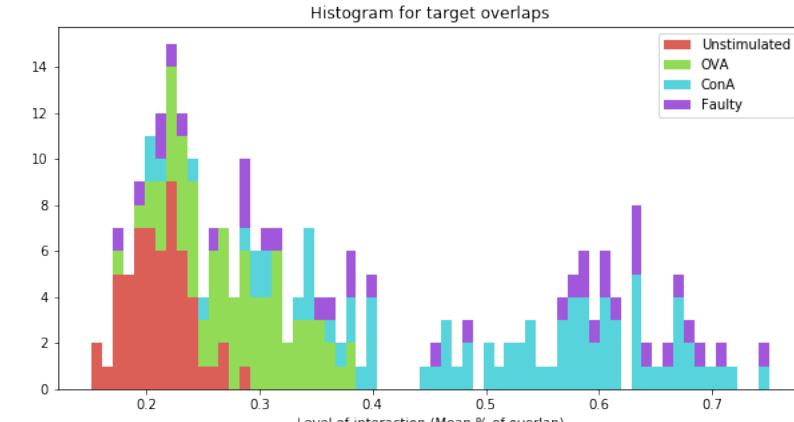
Classifier

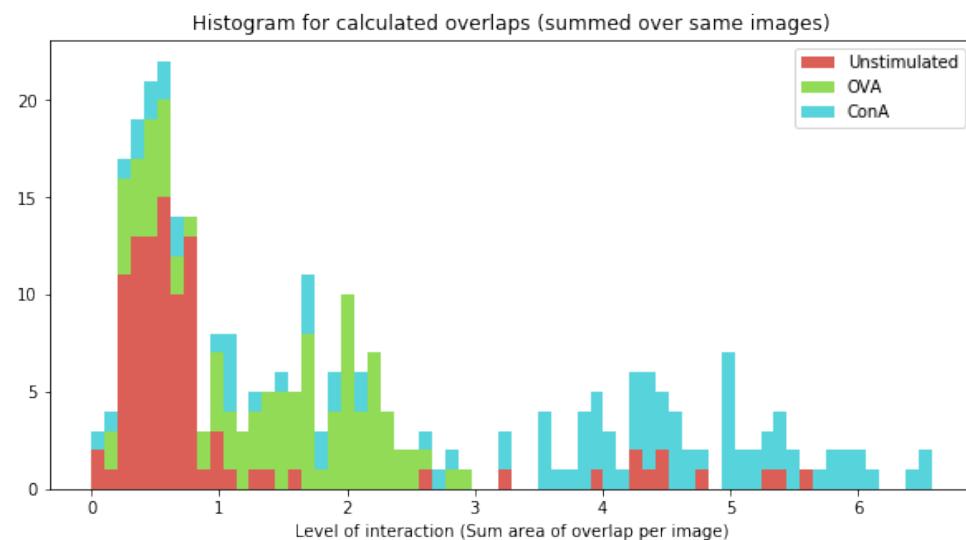
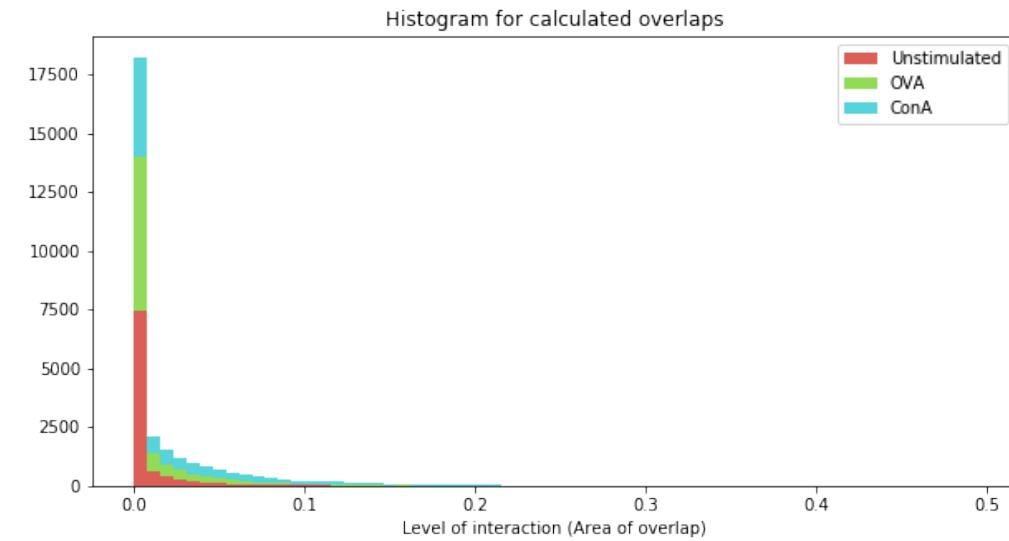
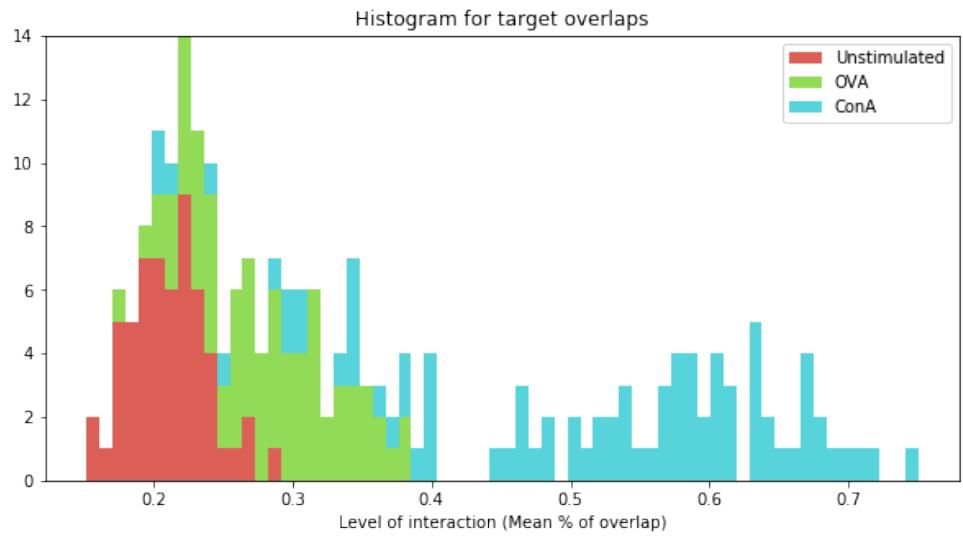
- Trained on full CK19 dataset
 - Classes all have the same size
- Training accuracy is 97.49%
- Test accuracy is 52.8%
- Need to test on:
 - A binary metric: interaction vs. no interaction
 - What is the threshold?
 - A quantity:
 - Use mean squared error from target



Overlap calculations

- Cannot replicate software calculations
 - Seems to use some kind of cell count
- My overlap metric:
 - Sum of overlapping area with IoU
- Seems to not be satisfactory
 - But if we sum across image, it replicates the original distribution
 - Especially if divided by 100
- Next slide with faulty removed





Overlap calculations

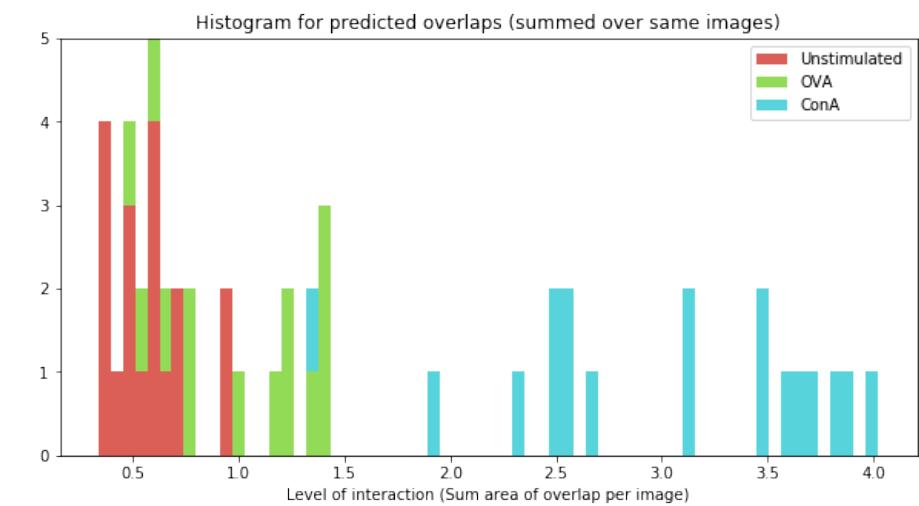
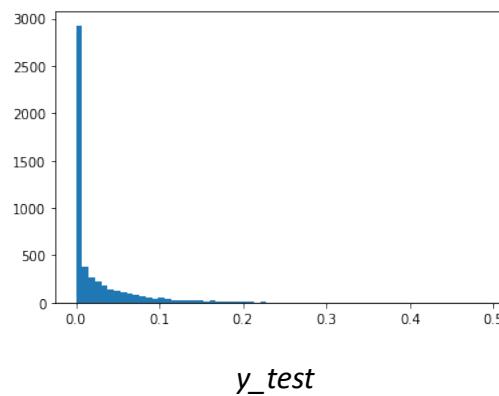
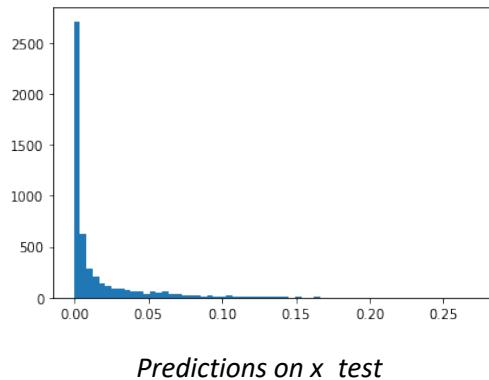
- Histograms
 - For faulty images, overlap = 0
 - And their label is the corresponding image, not the “Faulty” label

Classifier metric

- Binary: interaction vs. no interaction
 - Threshold: 0.2?
 - Issue: unstimulated with a lot of overlap
 - Hannah: does this have to do with 2D visualisation?
- Quantity
 - Try and predict ground truth
 - Use mean squared error to calculate difference

Classifier performance

- Classifier score
 - 0.00107 (MSE)
- Not very meaningful like this
- Histogram comparison:



Work to come this week

- Improvise visualisation plots for classifier performance evaluation
 - Overlapping histograms
 - Clustering with scatter points the size of overlap
- Classifier to Python file
 - Like I did for autoencoder visualisation
- Final classifier tuning
 - Needs to end somewhere
- Evaluation