Level 4 Project

Week 7/20

Schedule for weeks 6-7 (19-20)

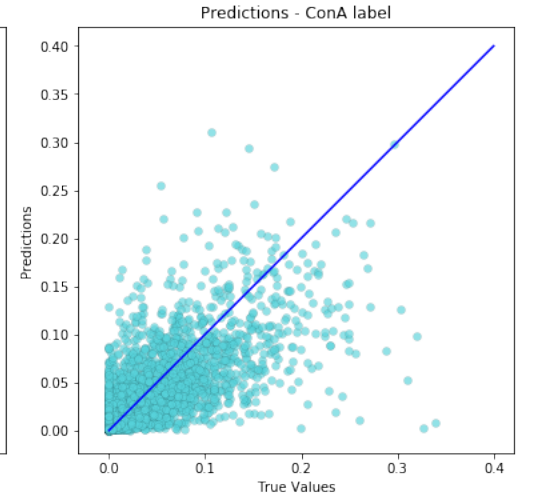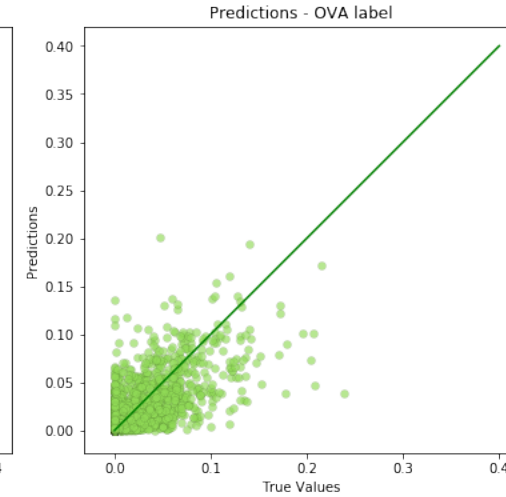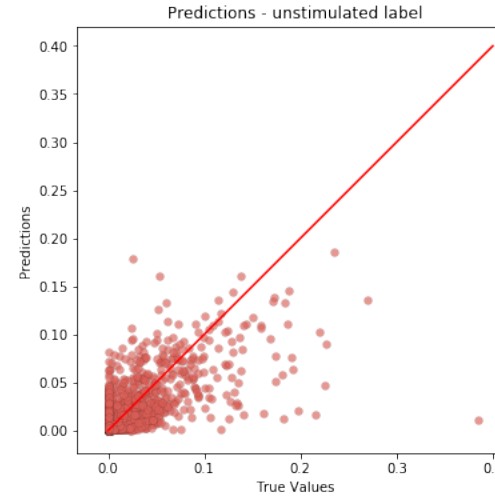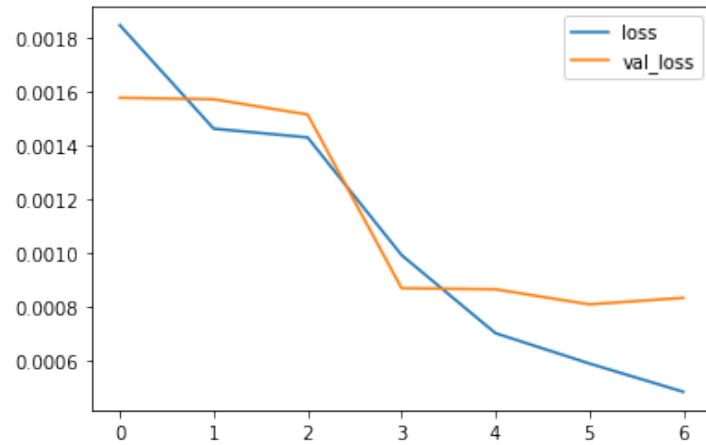- Improvise visualisation plots for classifier performance evaluation
  - Overlapping histograms
  - Clustering with scatter points the size of overlap
- Classifier to Python file
  - Like I did for autoencoder visualisation
- Final classifier tuning
  - Needs to end somewhere
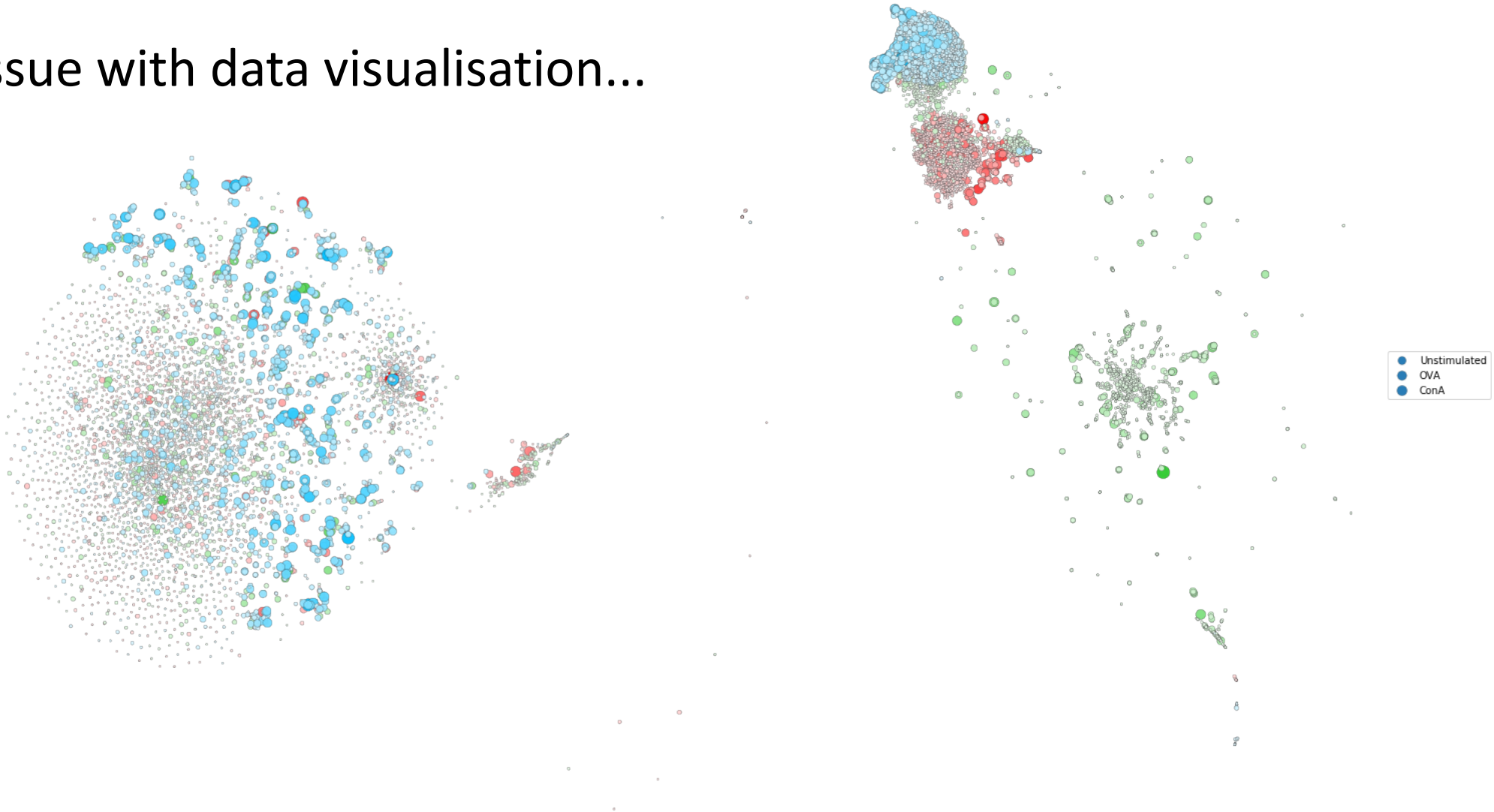- Evaluation

Improve visualisation plots
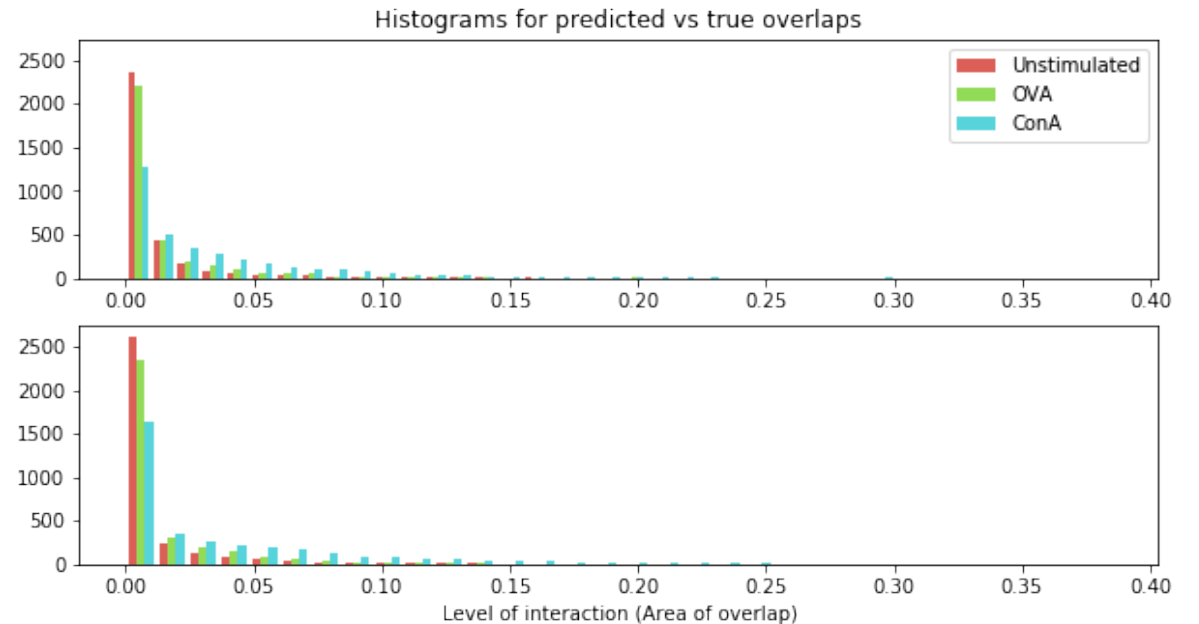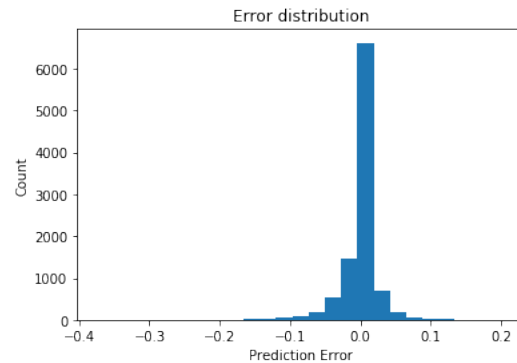
MSE score: 0.0007079740753397346
RMSE score: 0.026607781648635864
R2 score: 0.5263136923313141

Clustering with points the size of overlap

- Issue with data visualisation...

Final regression tuning

- Ran into some issues with using MAE as a metric
  - Loss was stagnating at 0.015 regardless
  - Issue with majority of 0s in the labels?

- Could add many things

- Question: should encoder be made non-trainable?
  - Is that cheating?
  - Or does it need to learn to map the encoded representation to the overlap prediction

Final regression + autoencoder tuning

- Have callbacks for learning rate and early stopping
- Dropout in the regression model for more robustness

- Autoencoder
  - Reduced dimensions again (to about 1000, almost a 100x reduction from original)
  - Reconstruction is still quite good and regression performs better
  - Better line of fit with OVA

New plots with better results

Autoencoder reconstruction:
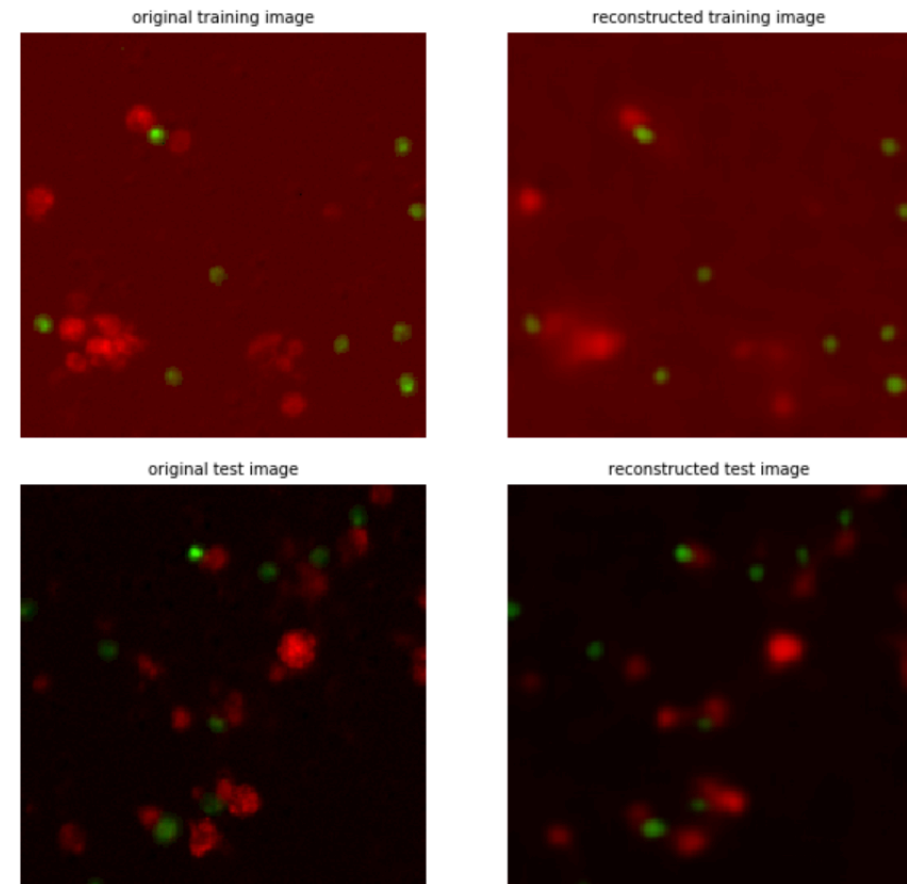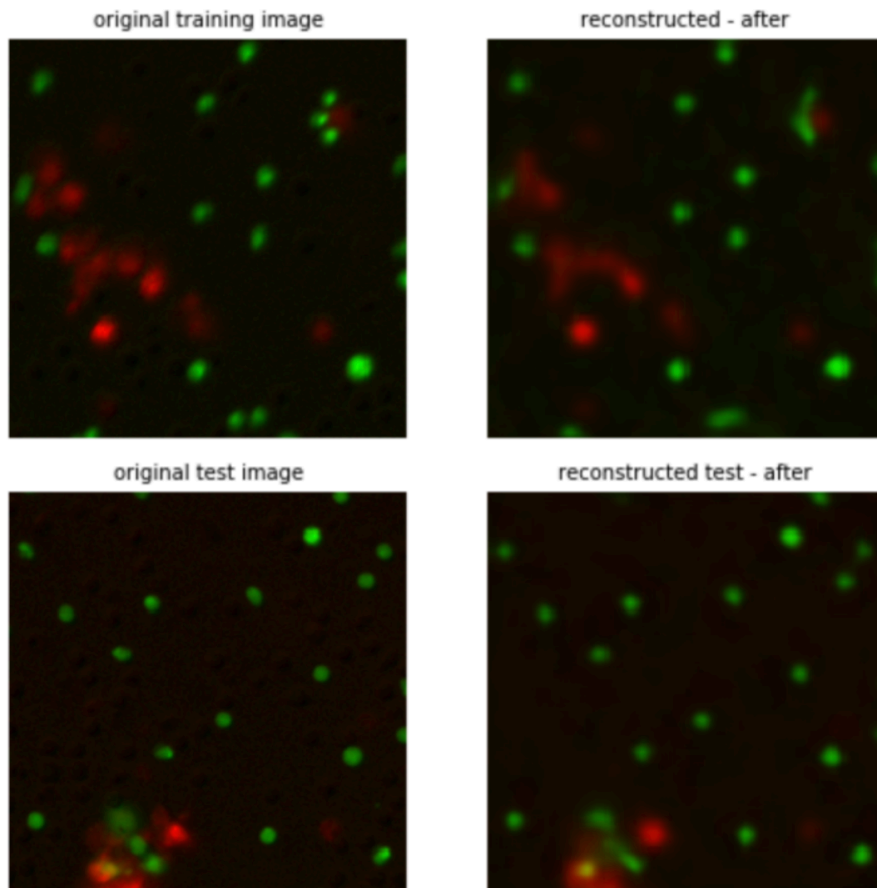
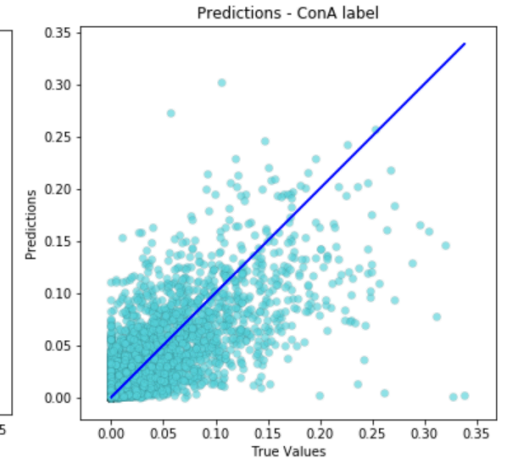# New plots with better results - regression
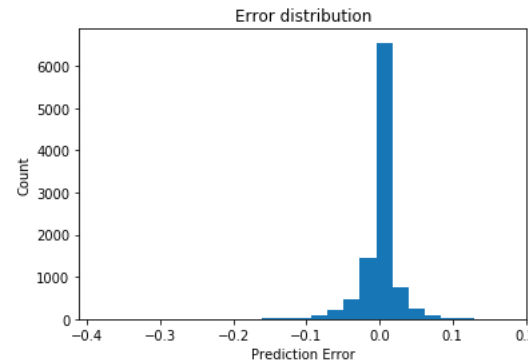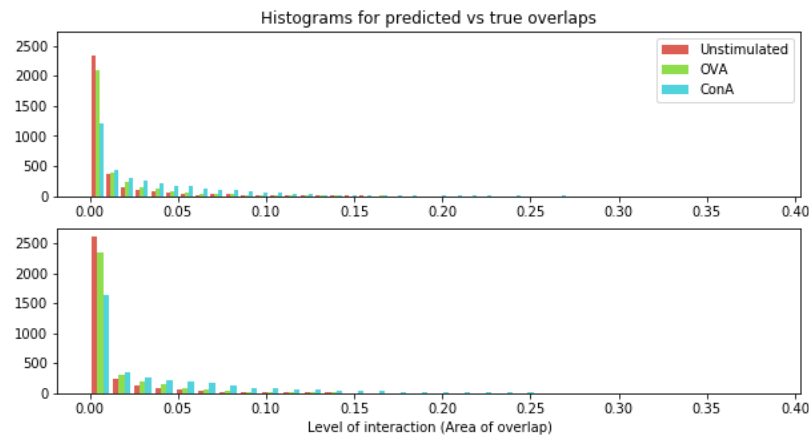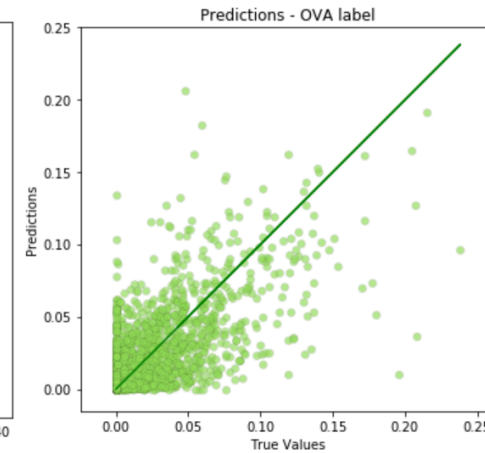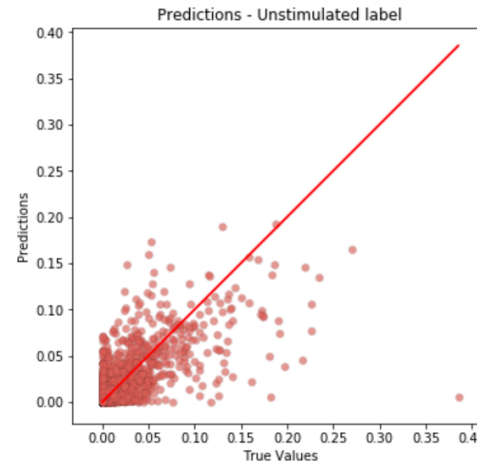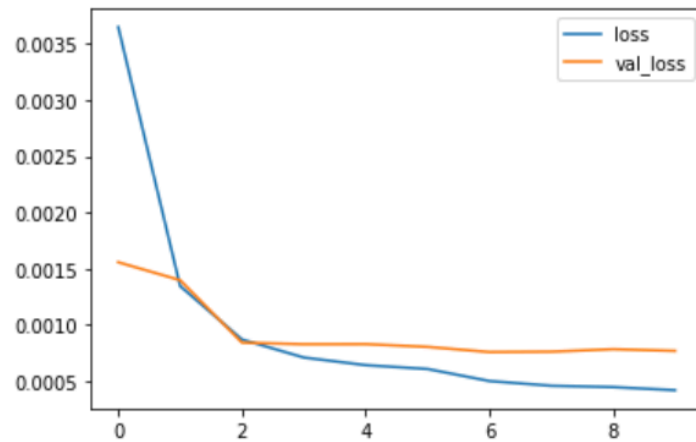
MSE score:
0.0006539400201290846
RMSE score:
0.0255722515285051
R2 score:
0.5624664127826691

Dissertation writing

- Materials & methods
- Final draft due in 3 weeks

Evaluation

- run_evaluation.sh
  - All datasets
    - Issue that the weights come from training that touched one of the datasets
    - --> particularly for DMSO
  - All datasets masked
- What does it evaluate?
  - Autoencoder reconstruction → is it visually satisfactory?
  - t-sne/UMAP reconstruction → can it find it unsupervised?
  - Regression scores
  - Supervised visualisation with size of markers dependent on overlap size → does this seem like a good idea?
- For anything else, e.g. UNet, showing image segmentation, could do on Jupyter notebooks.
  - Thoughts?
  - Anything else?
- This will take some time but can run in the background

Work to come this week

- Regression to Python file
- Cleaning up
- Evaluation
- Dissertation writing

Questions

- Should I re-include faulty labels in overlap counts, rather than 0…
  - Very versatile, hard to predict
  - Hard to remove entirely
- Making my project "runnable" to visitors
  - Is there a subsample of images I can post online?
  - If so, how many?