

Level 4 Project

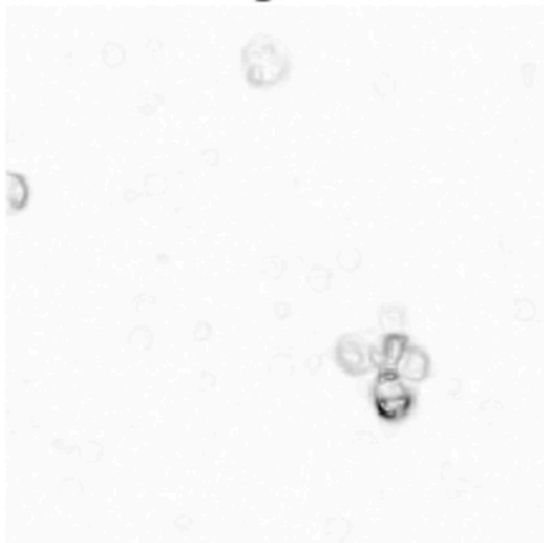
Week 12 Meeting
(Week 11 Recap)

Completed work

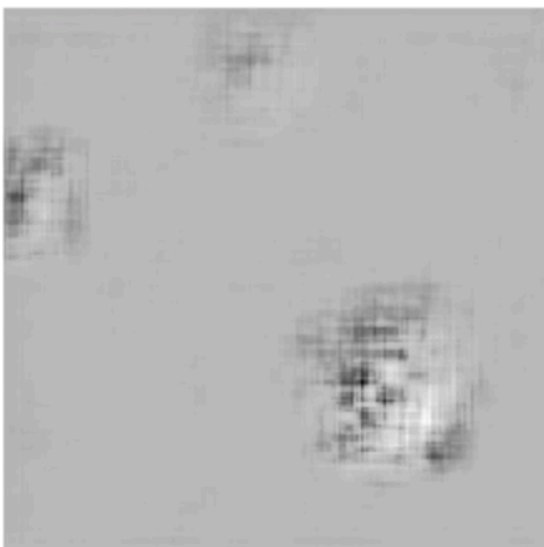
- Changed pre-processing to get autoencoder working
 - Next: does it work better with values < 255 clipped?
- Autoencoder outputs good image
 - Next: tune autoencoder to get smaller compression in bottleneck layer
- T-sne output changes, but does not seem meaningful
 - Next: use tuned autoencoder to see if get better output
 - Write code for visualising t-sne progress along multiple steps
- Wrote sliding window function to get more images out of the dataset
- Used numpy compression files to compress the DMSO dataset into a .npz file for faster loading in Colab
 - If this is promising might be worth it to try it with the full dataset; however this requires a large amount of running memory

For illustration: before

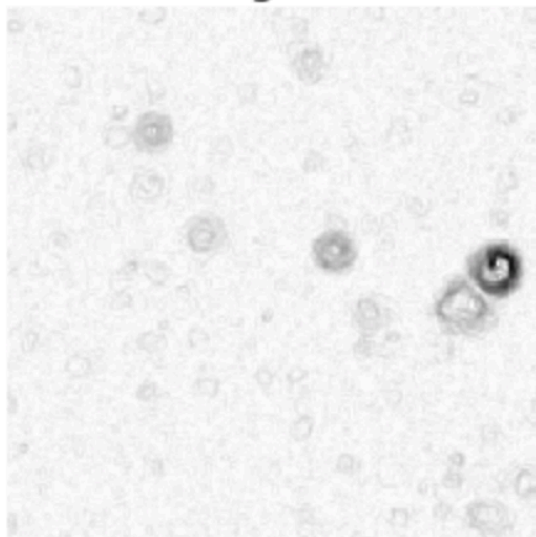
original



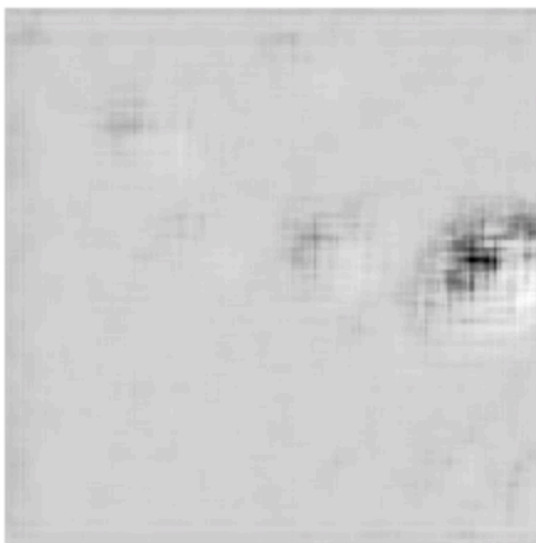
decoded



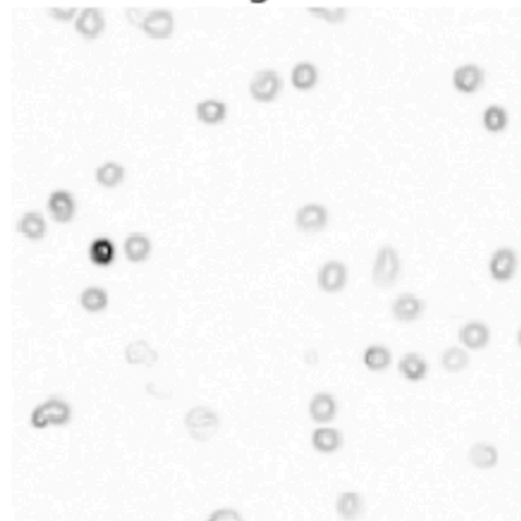
original



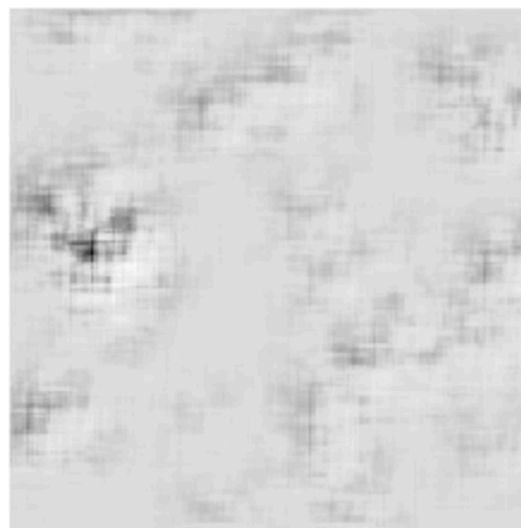
decoded



original

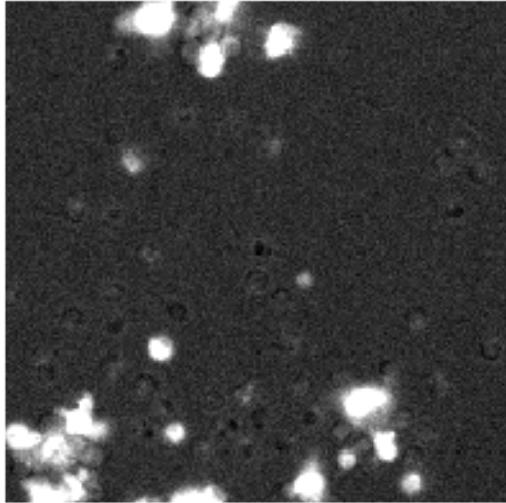


decoded

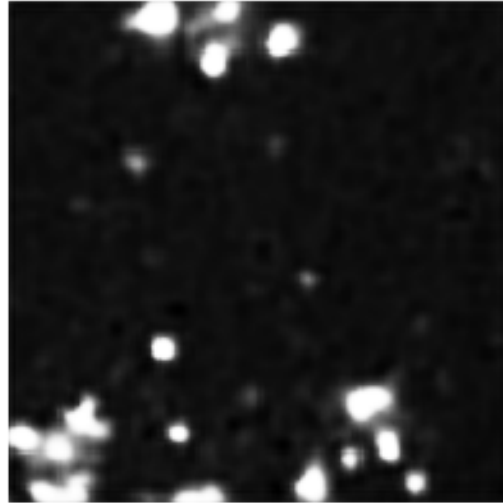


After: autoencoder

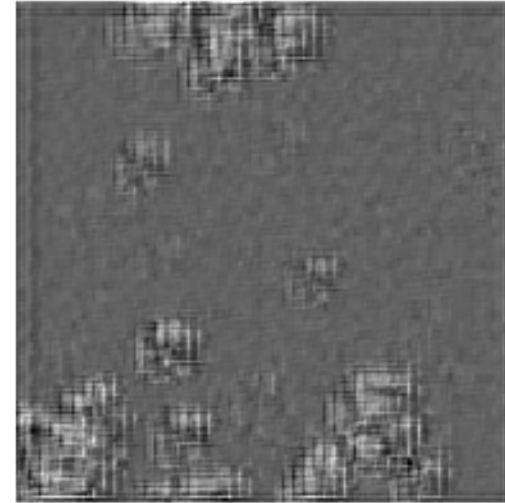
original training image



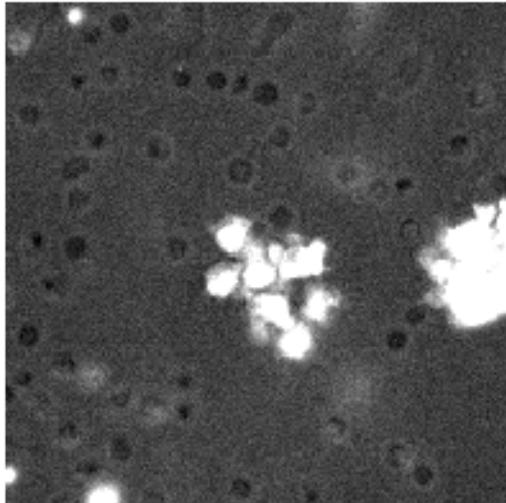
reconstructed - after



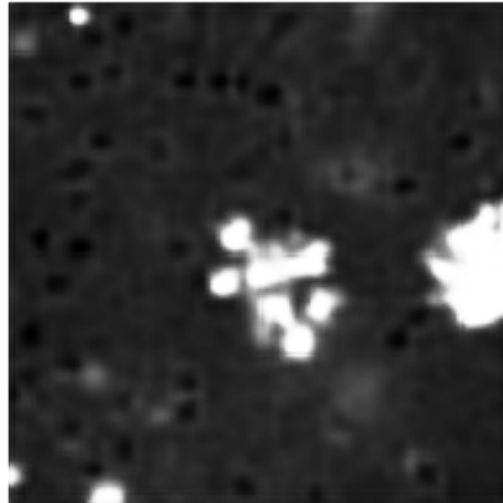
reconstructed - before



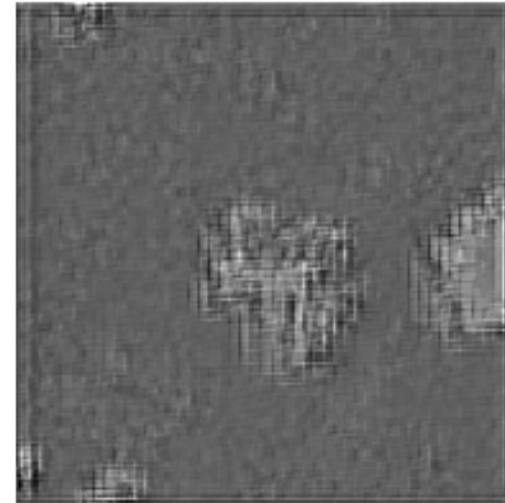
original test image



reconstructed test - after



reconstructed test - before



Clustering

- Before: https://github.com/leonore/l4-project/blob/master/src/baseline_performance.ipynb
- After: https://github.com/leonore/l4-project/blob/master/data/clustering_record.md

Plan for the rest of week 12 and 13

- **Week 12**

- Finish evaluating best pre-processing method
- Tune autoencoder for dimensionality reduction
- Evaluate t-sne clustering

- **Week 13**

- Visualise t-sne
- Explore methods of segmentation:
 - k-means clustering (2 clusters)
 - contour finding
 - structure similarity
 - blob detection
 - Top-hat transformation?
- Submit status report