Level 4 Project

Week 4/17

Schedule for weeks 3-4 (16-17)

- Collate results obtained by research for evaluation
  - Deliverables:
    - Detailed evaluation plan
    - **Report on current research methods for evaluating interactions**
    - Excel tables of research metrics that can be methodically parsed
- Finalise image segmentation techniques
  - Deliverables:
    - Code for the image segmentation techniques, along with an explanation of why it was chosen

Additional work

- Started looking at dissertation
  - Some bullet points
  - Analysis & design → materials and methods
- Live visualisation of scatter plots
- Finalised datasets (week 6-7)
- Looked at practical uses of UNet
  - How useful is this, for research?

Three datasets

- DMSO
  - DMSO from CK19, CK21, CK22
  - Question: Can the algorithm differentiate between 3 categories where differences should be most noticeable?
- CK19
  - 6 sets of each unstimulated, OVA, ConA
  - Question: Can the algorithm differentiate between 3 categories which all have the same number of data points?
- CK22
  - Mix of unstimulated and OVA
  - Question: Can the algorithm differentiate between two sets, if not three?

IN Cell Analyzer pipeline

Protocol for image analysis

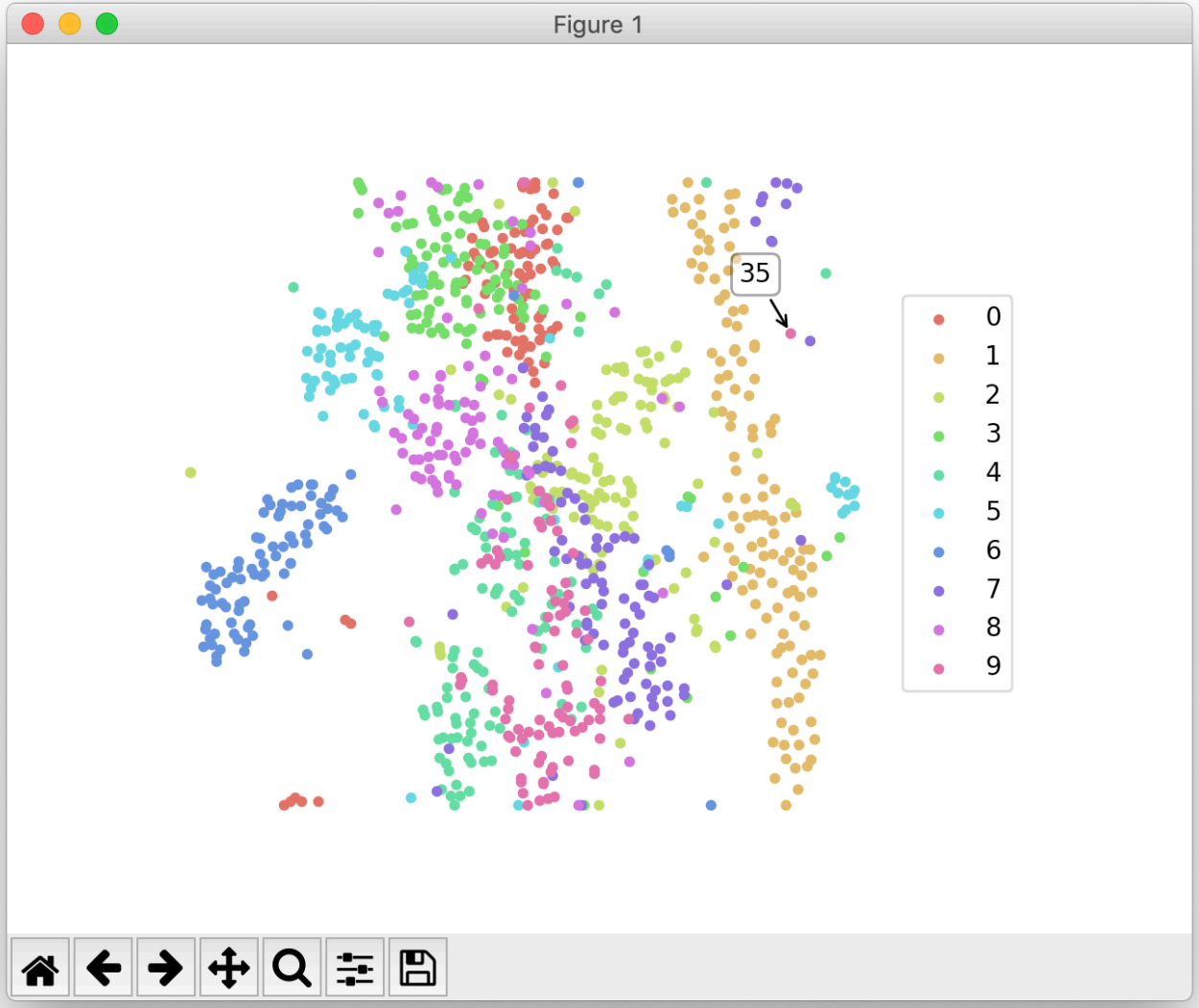
t-cells
- Preprocessing --> unable to know what is done
- Object segmentation (kernel size 5, sensitivity 17)
- Postprocessing
  - Sieve (binary) (area > 40)
  - Watershed clump breaking
- Measures
  - Cell count
  - Area size

dendritic cells
- Preprocessing --> unable to know what is done
- Object segmentation (kernel size 15, sensitivity 16)
- Postprocessing
  - Sieve (binary) (area > 18)

Overlap
- Preprocessing
- Intensity segmentation
  - Low threshold 1.0, upper threshold 4095.0
- Measures
  - Area overlap

Live visualisation

- Demo
- src/live_plot_test.py



Questions

- Unsure of usefulness
- “Deep learning” → K-means masks are fed back into autoencoder, but on its own is not a deep learning technique
- Anything else to look into?

Next steps for this week

- Jupyter notebooks → Python files
- Start evaluating
- Keep writing the dissertation
  - Materials & methods