Week of 11/27 Deliverables

cobalt

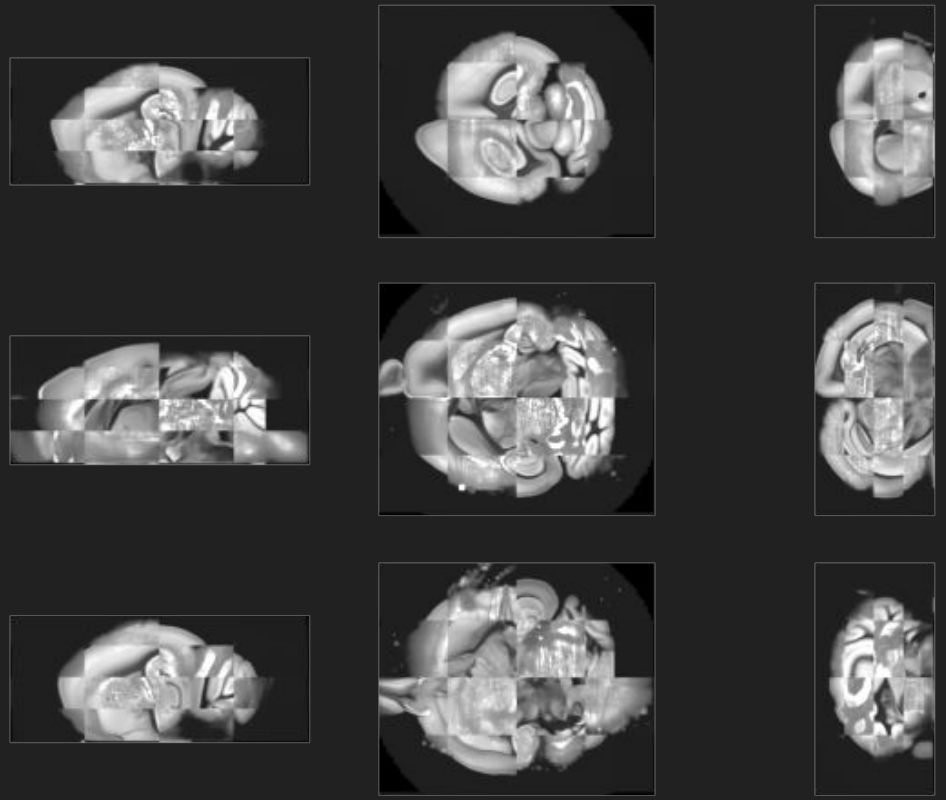
Last week’s goals

- Register 170119_Insula_grCOMET_244_08-39-35 to atlas
- Try simple method for cell detection
  - Run blob-metrics on outputs
- Look into Bias Correction
- Initial work for Tractography Annotations

100% complete >50% complete 0% complete

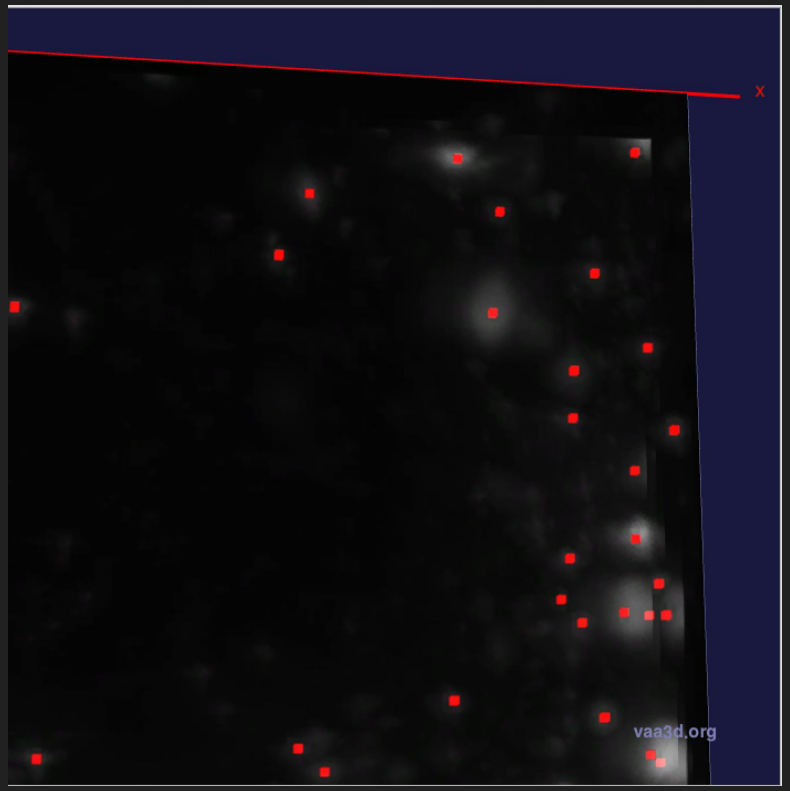
Registration of atlas to insula brain indicates good initial alignment

- Affine registration on right
- Working on refining lddmm parameters



Basic denoising/preprocessing with connected components shows promising results

- Basic preprocessing involves
  - Otsu's Binarization
  - Adaptive Thresholding
  - Morphological Hole Filling (Dilation)
- 3D connected components is applied to segment voxels of different cells from which centroids were identified
- Notebook
- Boss Link



Basic denoising/preprocessing with connected components shows promising results

	Accuracy (%)	Precision	Recall
cell_detection_0	79.41	0.34	0.37
cell_detection_1	80.88	0.26	0.28
cell_detection_2	90.24	0.44	0.46
cell_detection_3	71.42	0.68	0.69

- Results on *cell_detection_3* not so good
  - Lots of salt and pepper noise (larger background blobs)
- Results on *cell_detection_2* are pretty good
  - less noise
  - cells are well separated with more uniform intensity

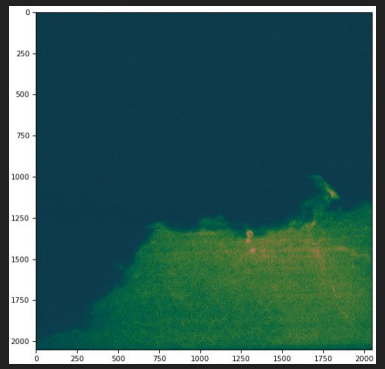
	Accuracy (%)	Precision	Recall
cell_detection_0	64.7	0.32	0.38
cell_detection_1	76.4	0.33	0.36
cell_detection_2	75.6	0.25	0.28
cell_detection_3	84	0.22	0.23

Old complicated method results

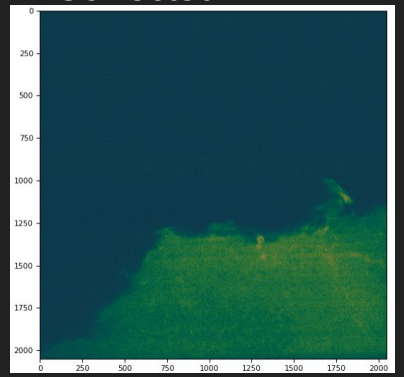
Bias correction for COLM data

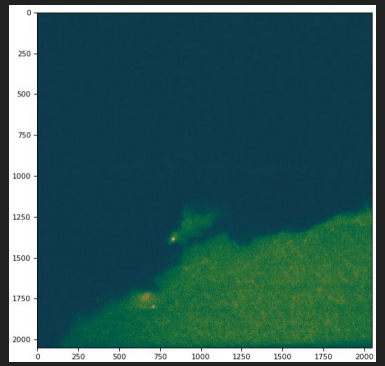
- Explored data, looked into N4ITK, found out Daniel already ran a similar bias correction on the raw images. Samples to right.
- Meeting with Daniel this week to get rest of bias corrected data
- Next step is to run terastitcher and qualitatively evaluate or find quantitative ways to evaluate the stitching and bias correction.

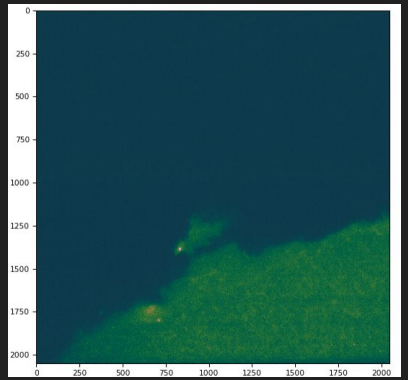
Uncorrected



Corrected







Tractography Annotations

- Tractography_0 Annotations
- Link to the tractography_0 subvolume
- Used Vaa3d's Neuron tracing tool to annotate
- Blue lines represent the annotations
    - Annotations are in 3d

Figure 1

Next week’s goals

- Register atlas to 170119_Insula_grCOMET_244_08-39-35
- Register atlas to 170726_Insula-vCapture-Atenolol2_00-56-01
- Refine the existing results from basic cell detection algorithm
- Read Terastitcher documentation and test it on sample data
  - Reach: use it to stitch together bias-corrected s3617 tiles
- Continue with Tractography annotations
  - Reach: Implement MVP tractography analysis