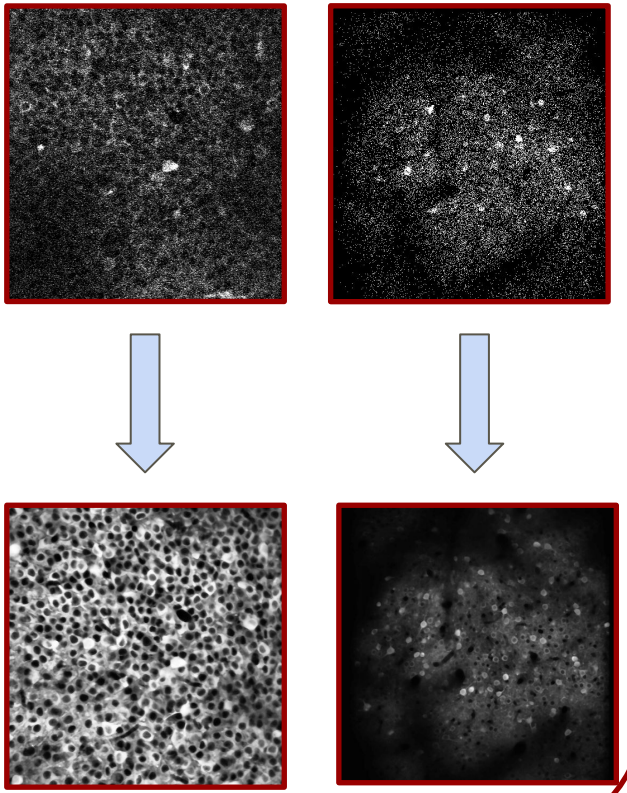
CSCI 8360 – Project 3
Neuron Finding

Team Rhodes
Andrew Durden, Abolfazl Farahani, Saed Rezayi

Tiramisu

Data processing

- Noise reduction by averaging images in each sample to create one image per sample and smoothing
- Creating masks from json files
- Data Augmentation by slicing rotating and transposing each image



Results

Recal	Inclusion	Exclusion	Precision	Total score
0.7	0.12	0.51	0.87	2.2

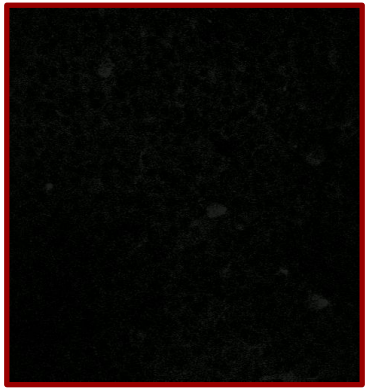
Future work

- Creating more samples from original data

NMF

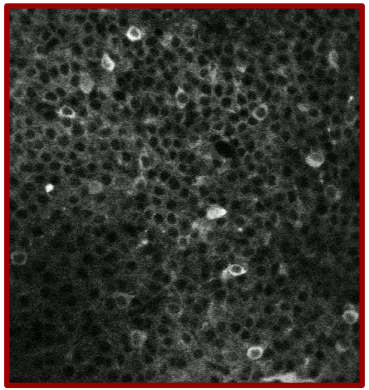
Procedure

- Normalized input images
- Used Thunder-Extraction implementation of Local NMF
- Splits images into chunks and applies NMF to chunks
- Wrote a wrapper script to fit to each image in parallel
- Determines regions based on matrix factorization



Results

Recal	Inclusion	Exclusion	Precision	Total score
0.92	0.67	0.67	0.93	3.175



Future work

- CNMF-E [CalmAn: An open source tool for scalable Calcium Imaging data Analysis]

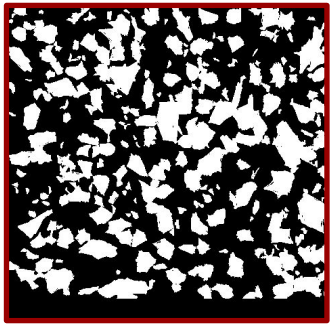
Prameter tuning

Per sample parameter tuning

Sample Id	#components	iteration	percentile	Chunk size	Score
00.00.test	10	20	95	50	2.9
00.01.test	5	30	95	50	3.0
01.00.test	5	30	95	50	3.3
01.01.test	3	50	95	50	3.2
02.00.test	5	50	99	100	3.4
02.01.test	5	50	99	100	3.3
03.00.test	10	30	95	50	2.9
04.00.test	5	50	99	50	3.3
04.01.test	3	5	95	60	3.3

Total score: 3.175

NMF mask



Tiramisu mask