

Neuron Finding

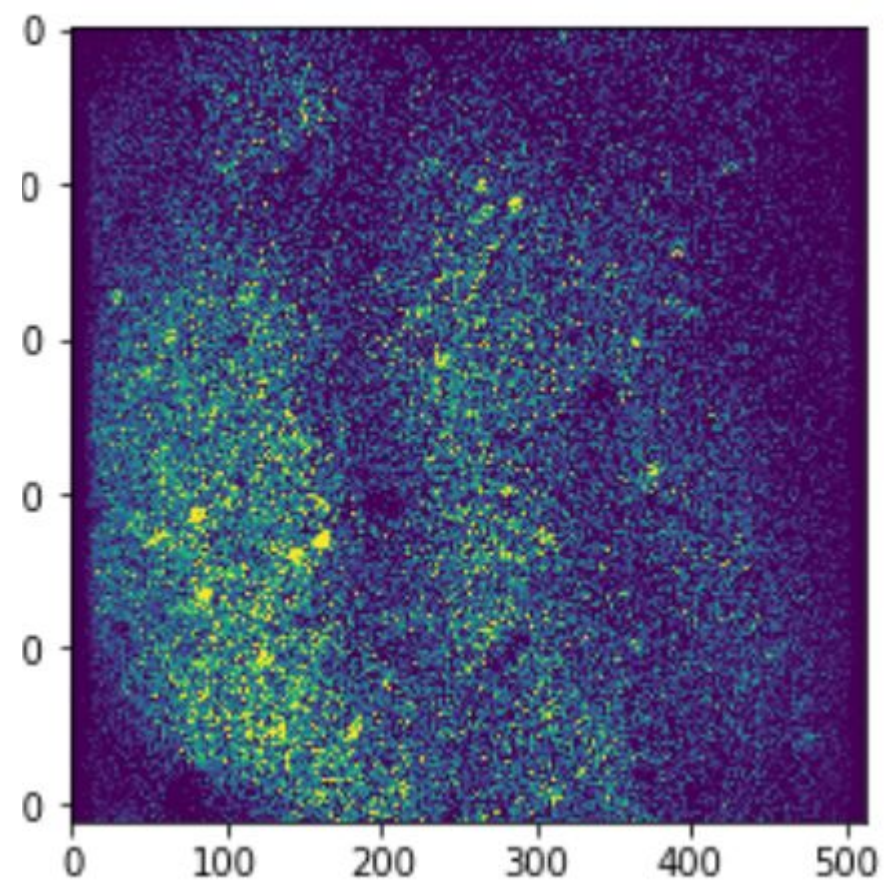
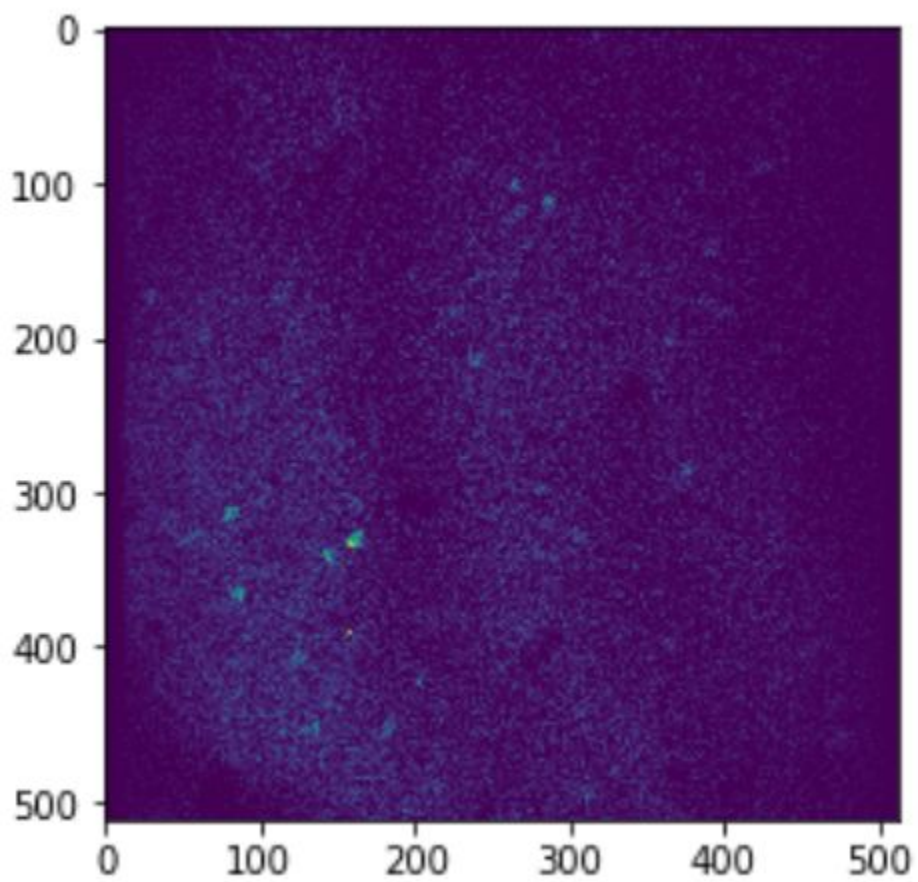
Team Keller

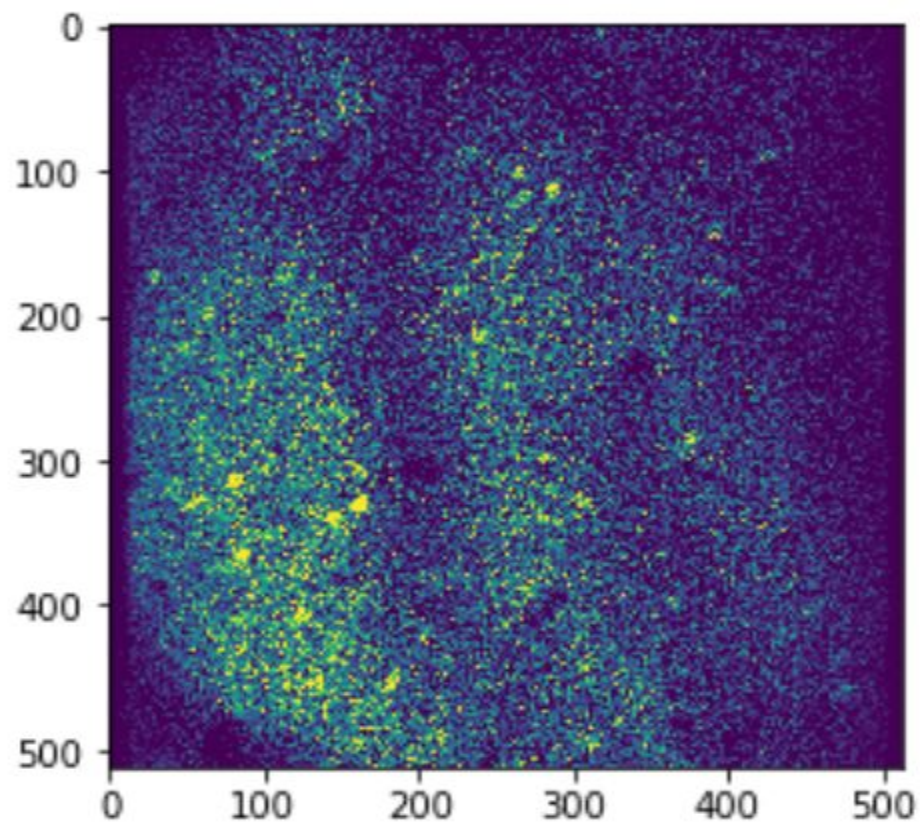
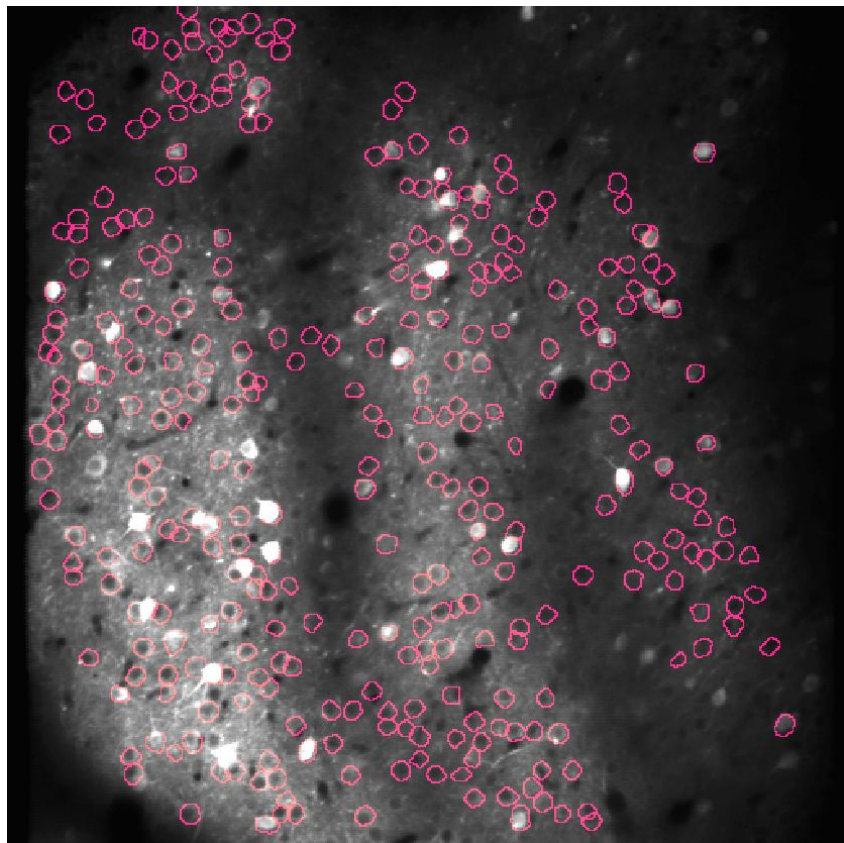
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Preprocessing (Contrast Enhancement)

- Clipping all pixel values above the 99th percentile and below the 3rd percentile.
- Then scaling between min (0) and max (65535).
- In practice, it helped only for some datasets (not all).

Reference - [Automatic Neuron Detection in Calcium Imaging Data Using Convolutional Networks](#)





Models

NMF

- Tried several parameters.
- Best result of 3.25034.

Unet and Tiramisu

- Unable to convert mask labels to regional labels.
- How to decide a region and which pixels belong to that region?

Dataset	Threshold	Chunk Size	Contrast Enhancement	Score (Rounded Off)
neurofinder00.00	91	64 x 64	No	3.0
neurofinder00.01	95	50 x 50	No	3.1
neurofinder01.00	95	50 x 50	Yes	3.5
neurofinder01.01	95	50 x 50	Yes	3.5
neurofinder02.00	99	128 x 128	Yes	3.4
neurofinder02.01	99	128 x 128	Yes	3.4
neurofinder03.00	90	64 x 64	Yes	3.1
neurofinder04.00	97	128 x 128	No	3.2
neurofinder04.01	97	64 x 64	No	3.3

Future work

- Grid search of NMF parameters, instead of manual tuning.
- Full implementation of CNN based models.