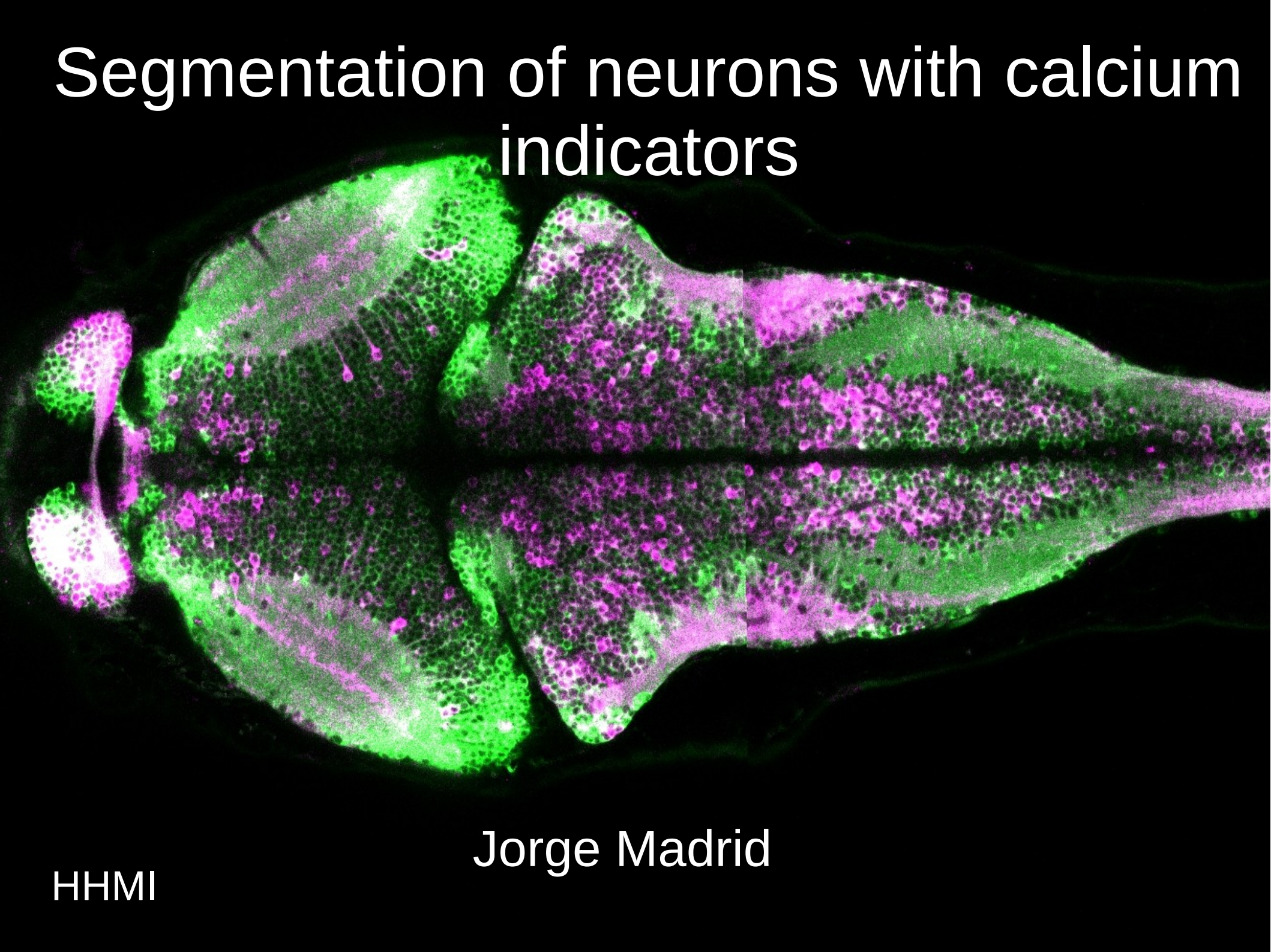
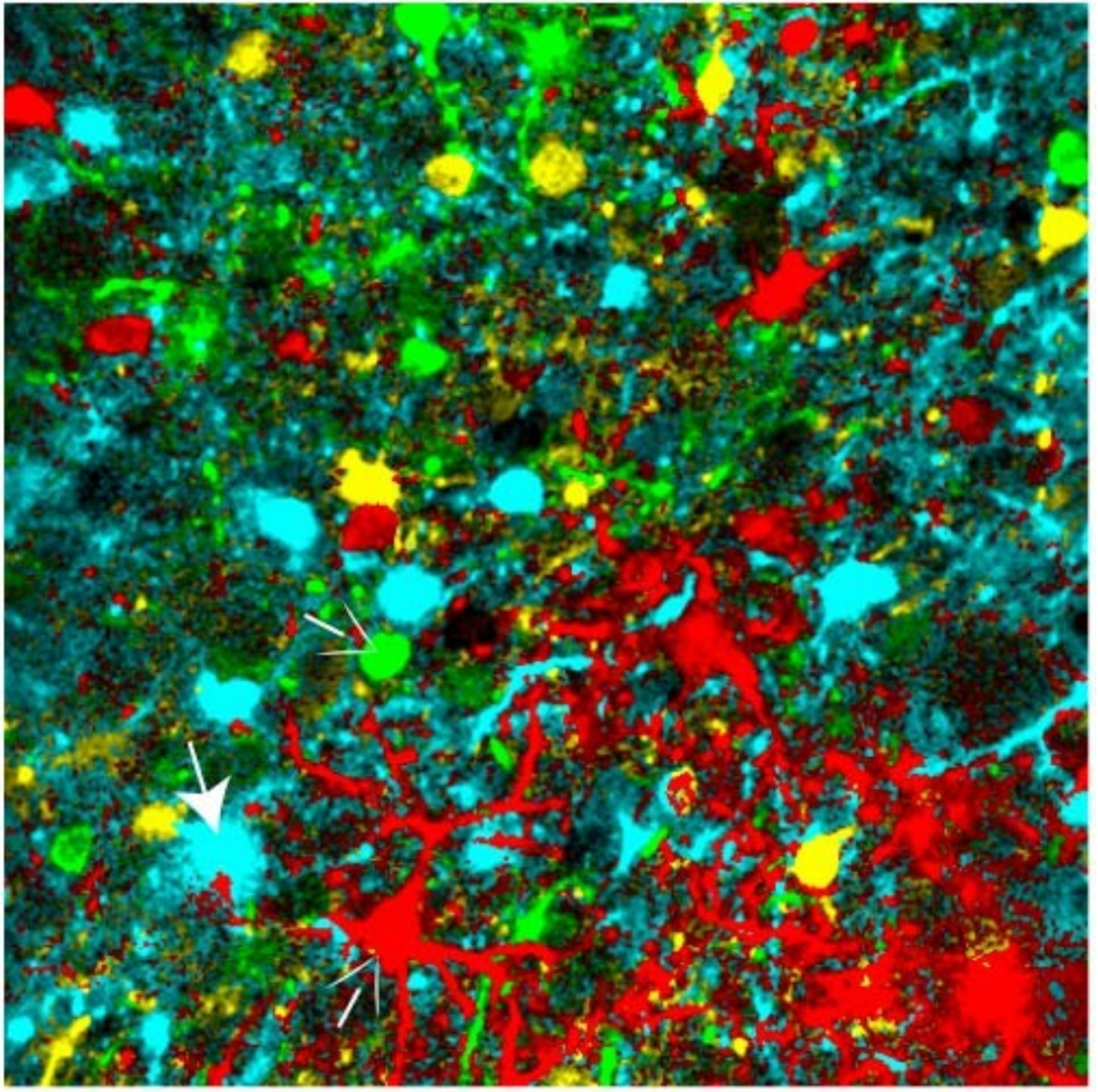
Segmentation of neurons with calcium indicators

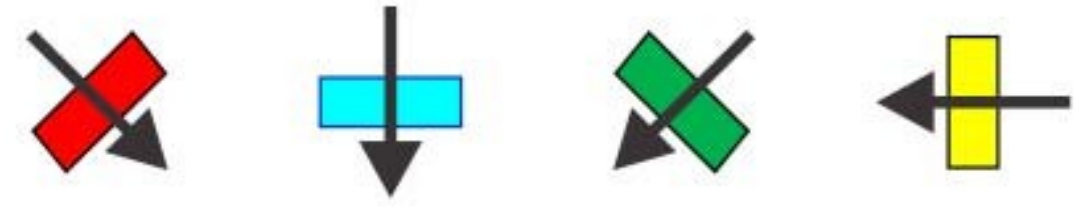


Jorge Madrid

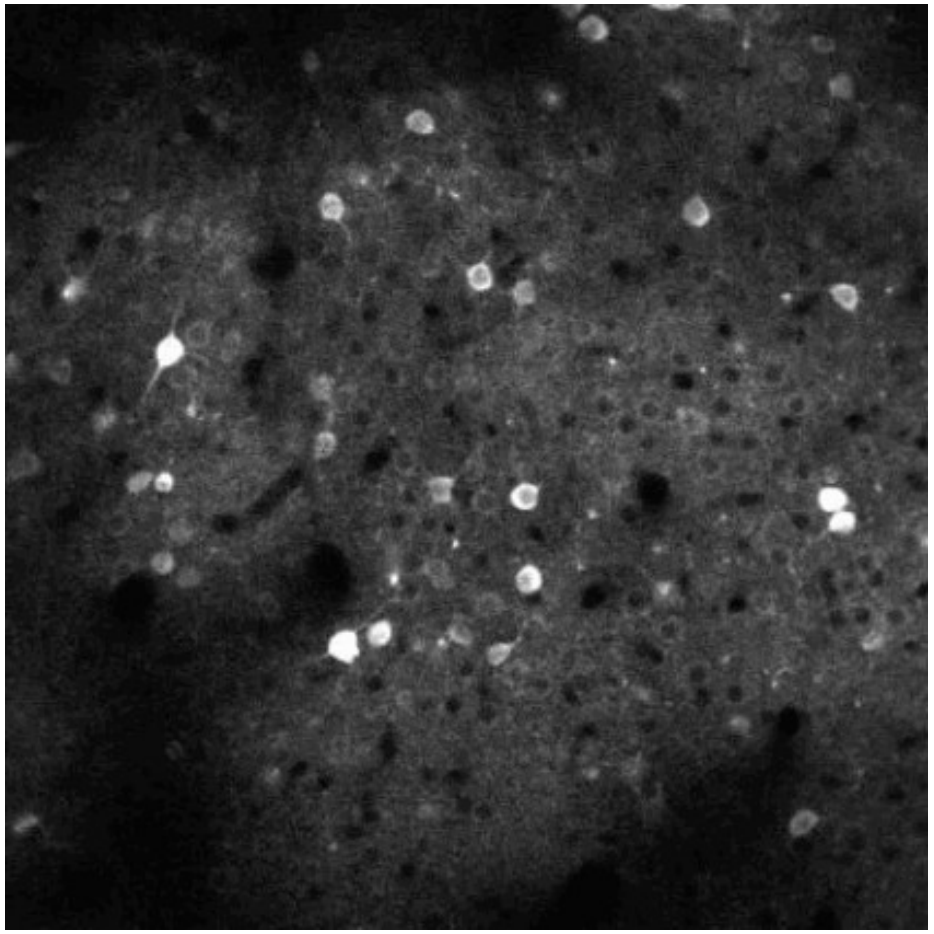
HHMI

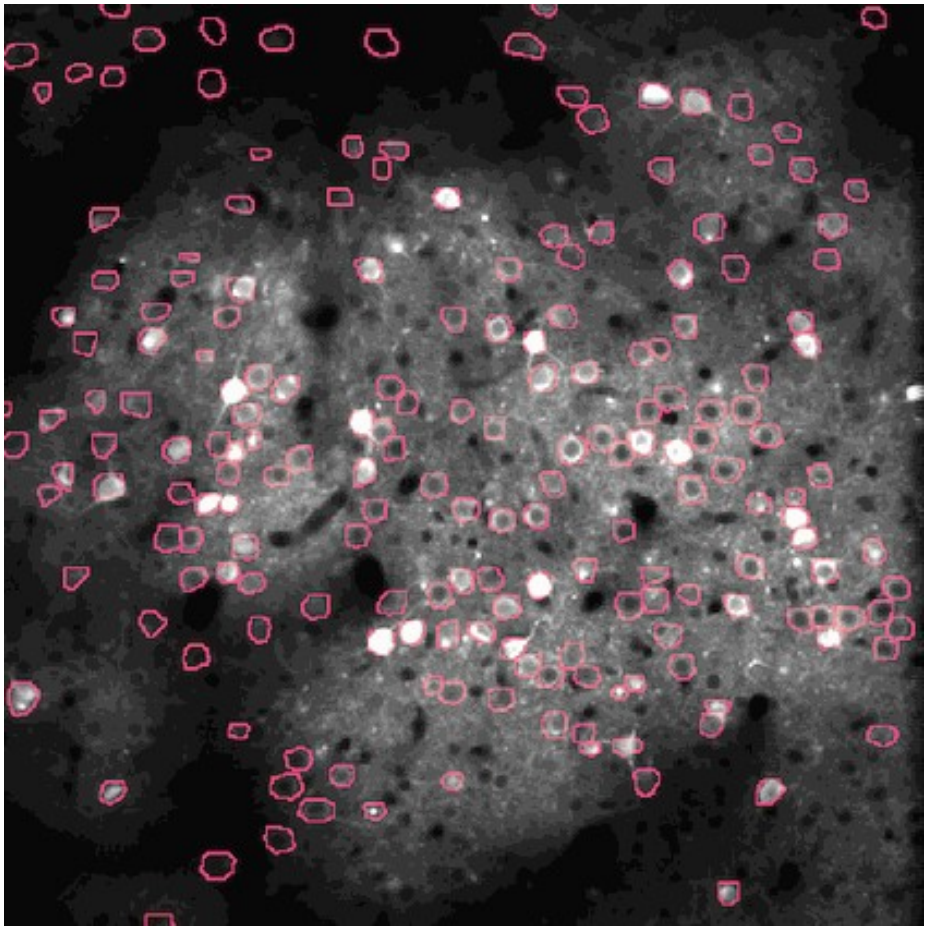
GENIE Project, HHMI.



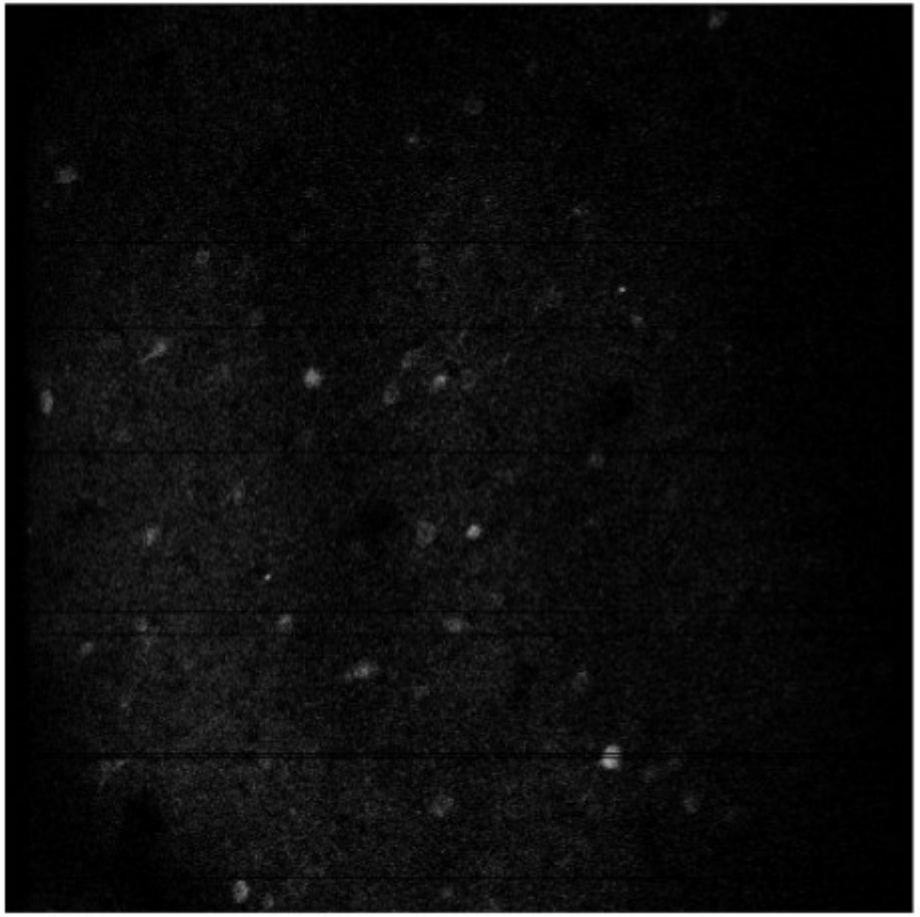


NEUROFINDER

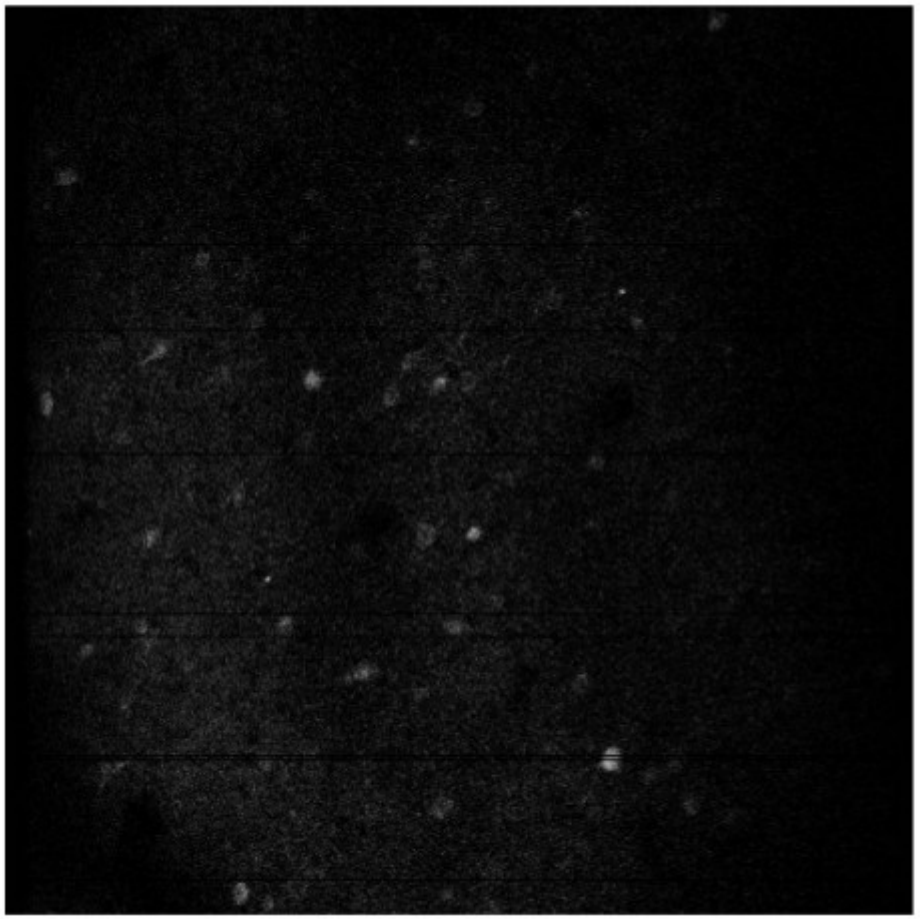


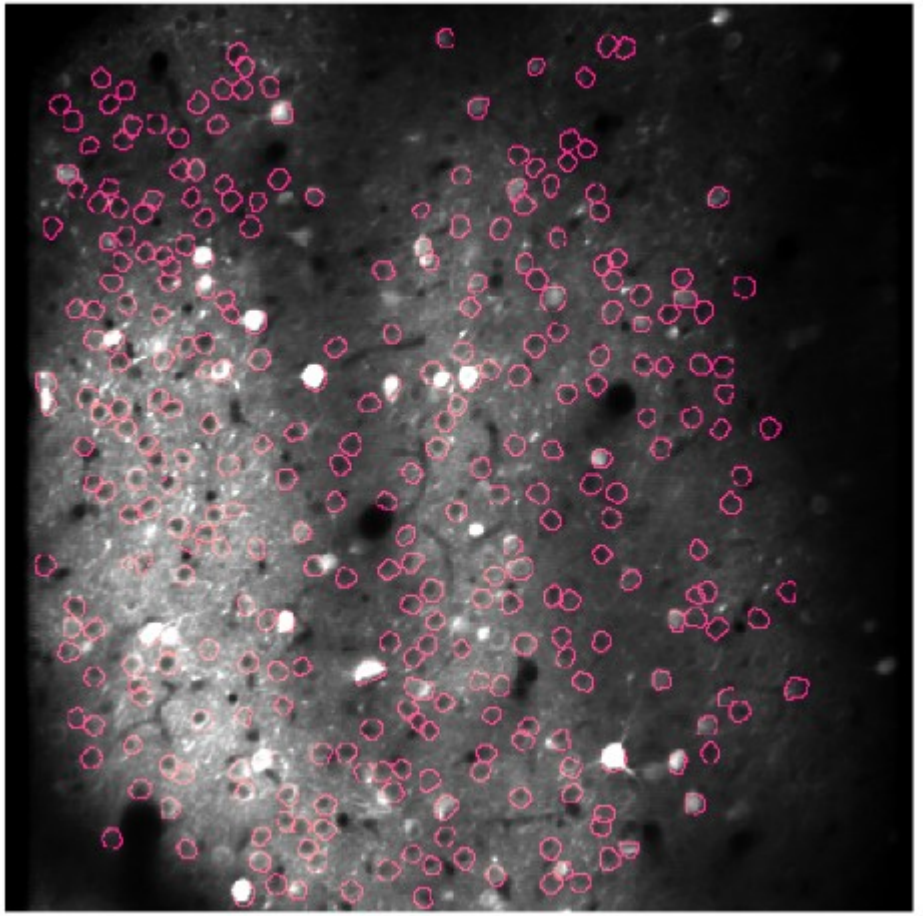


How does an average frame look like?



How does an average frame look like?



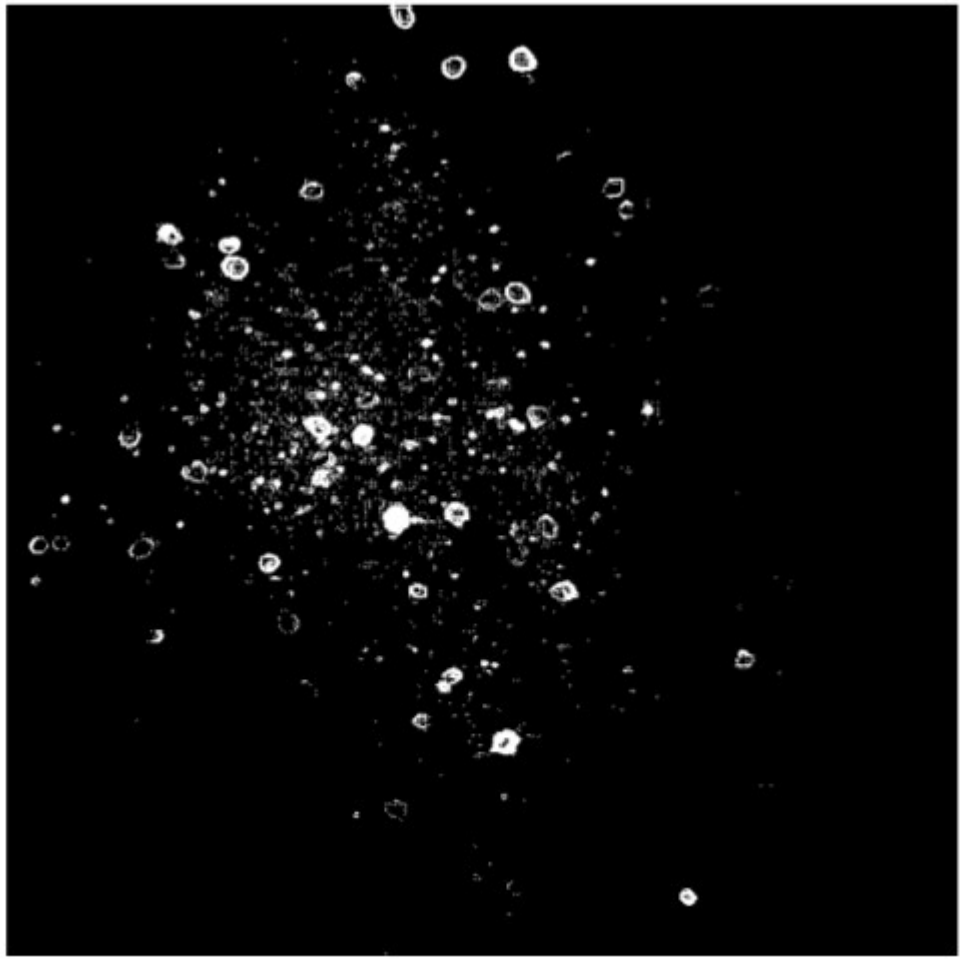


Challenge

- Extract edges
- Given one annotation per video
- With strong background
- And dim neurons

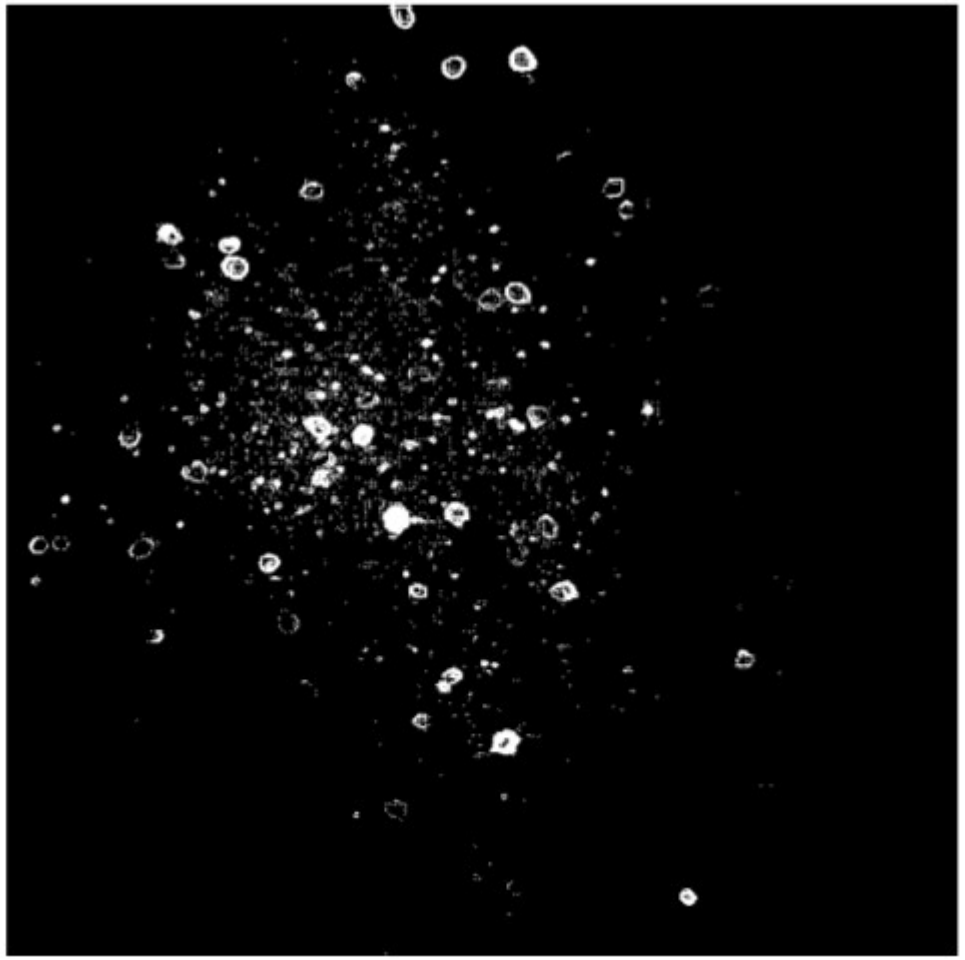
Baseline

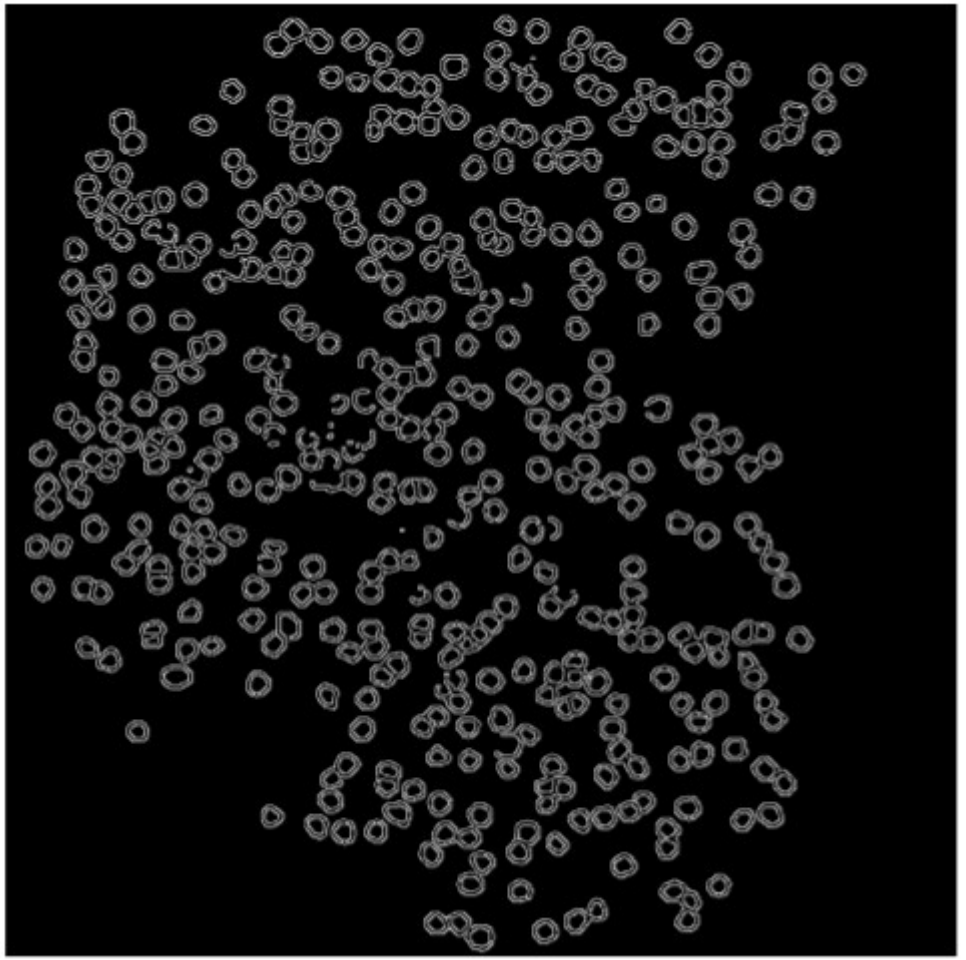
Morphological operations



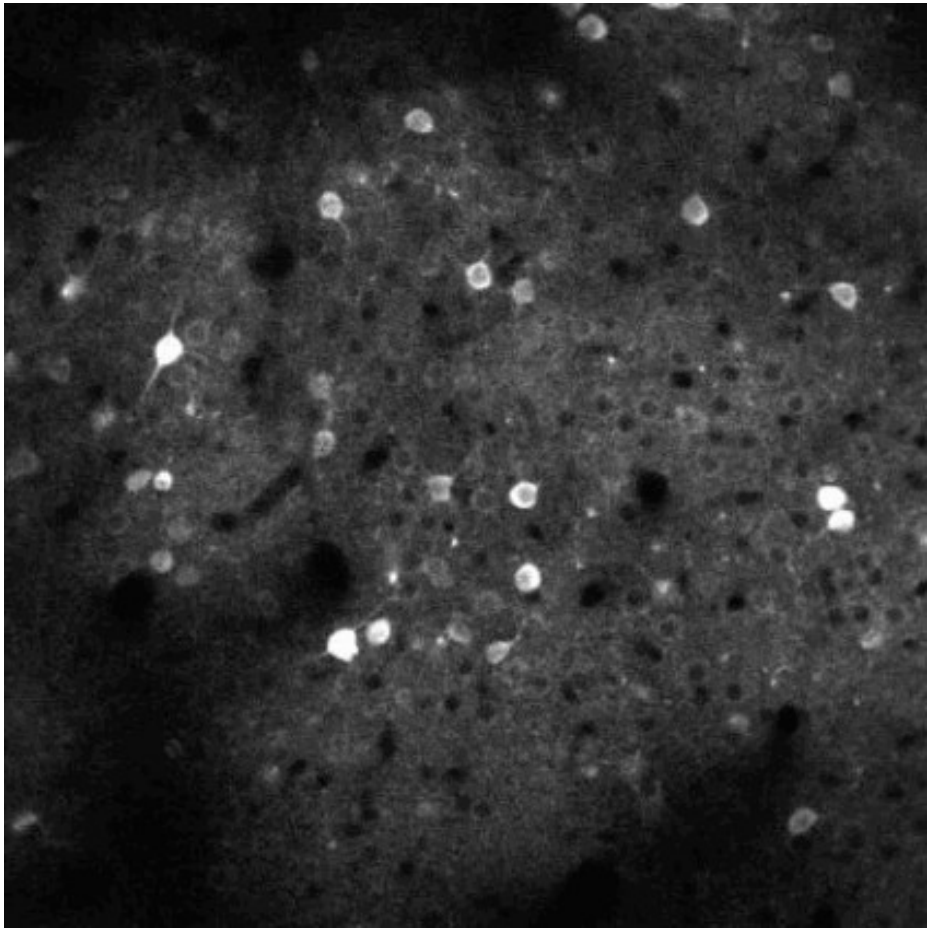
Baseline

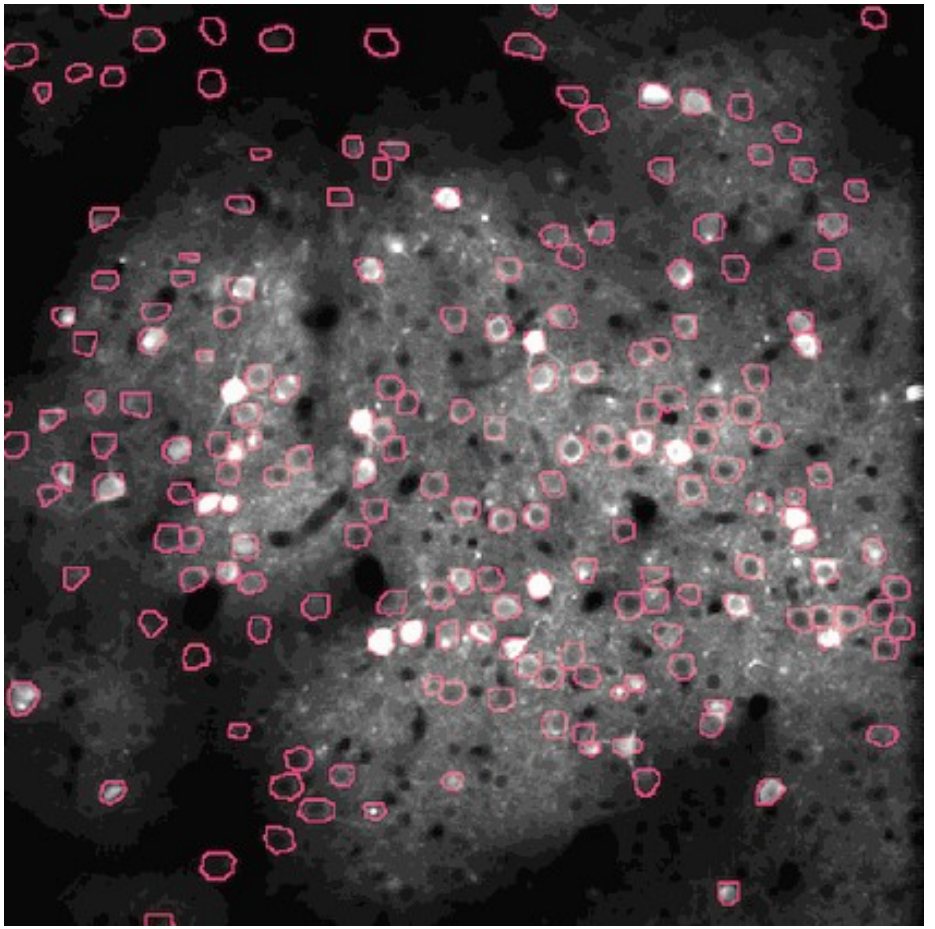
Morphological operations





Problems:





- Edges are too fine
- Background is too strong

Approach

Deep Retinal Image Understanding

Kevis-Kokitsi Maninis[1], Jordi Pont-Tuset[1], Pablo Arbeláez[2], and Luc Van Gool[1,3]

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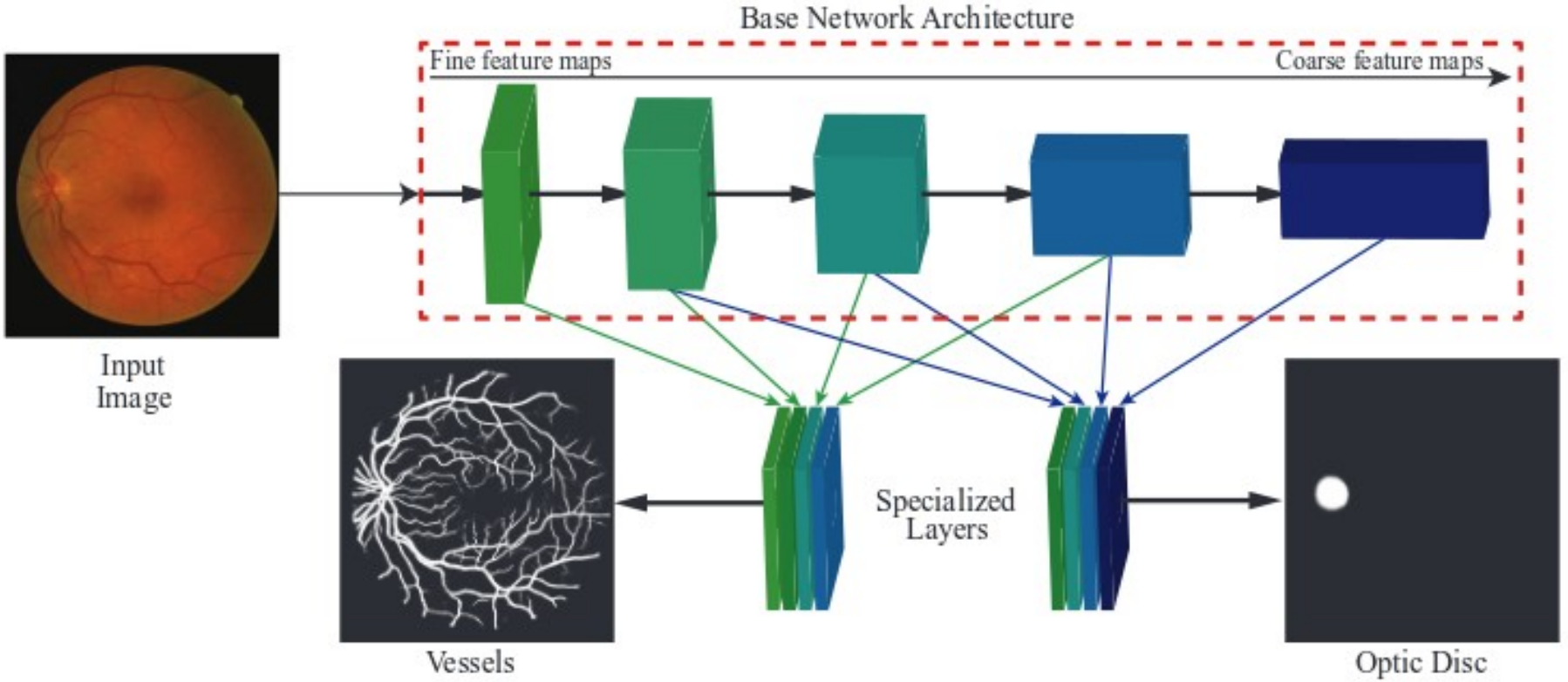
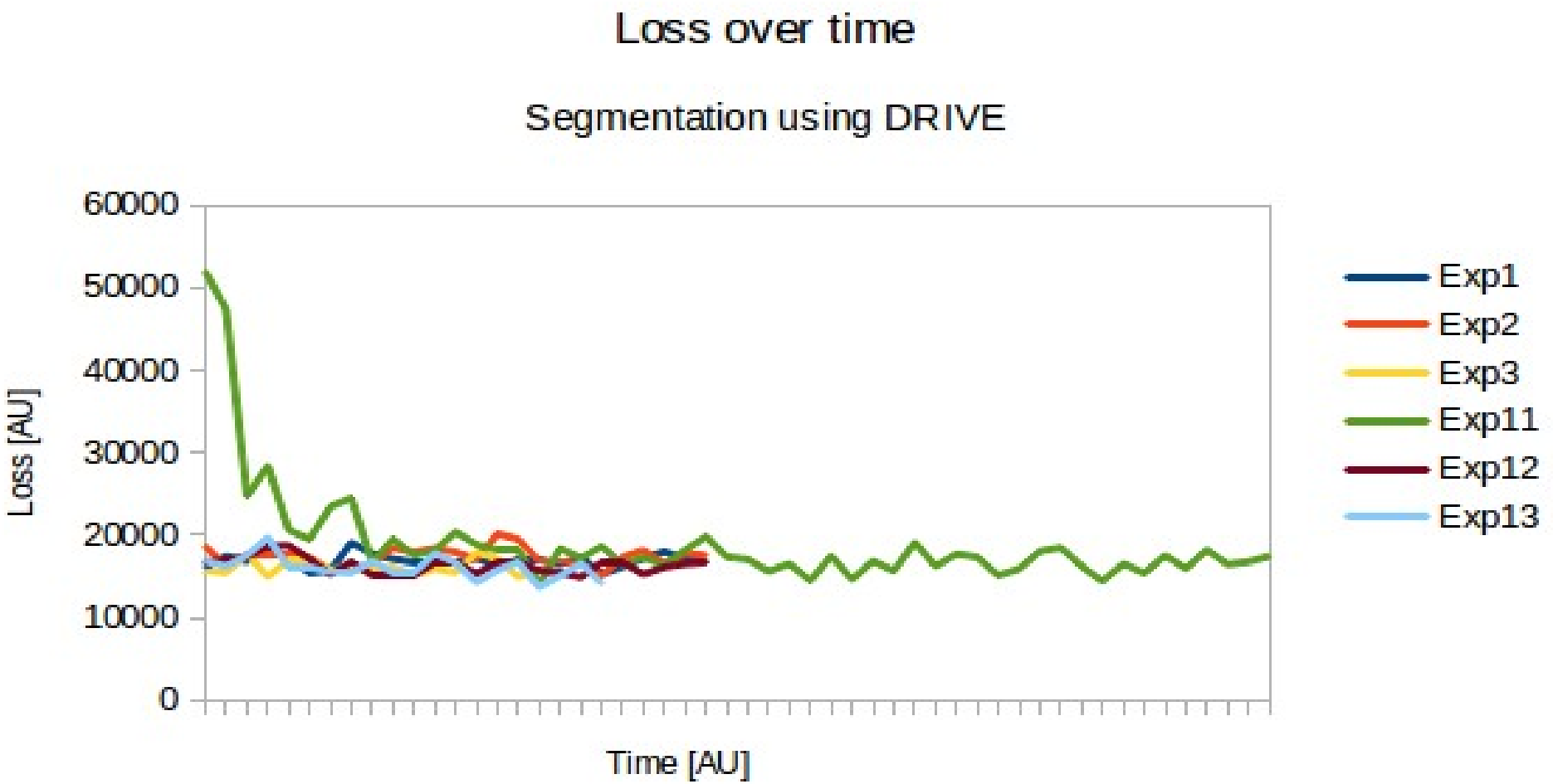
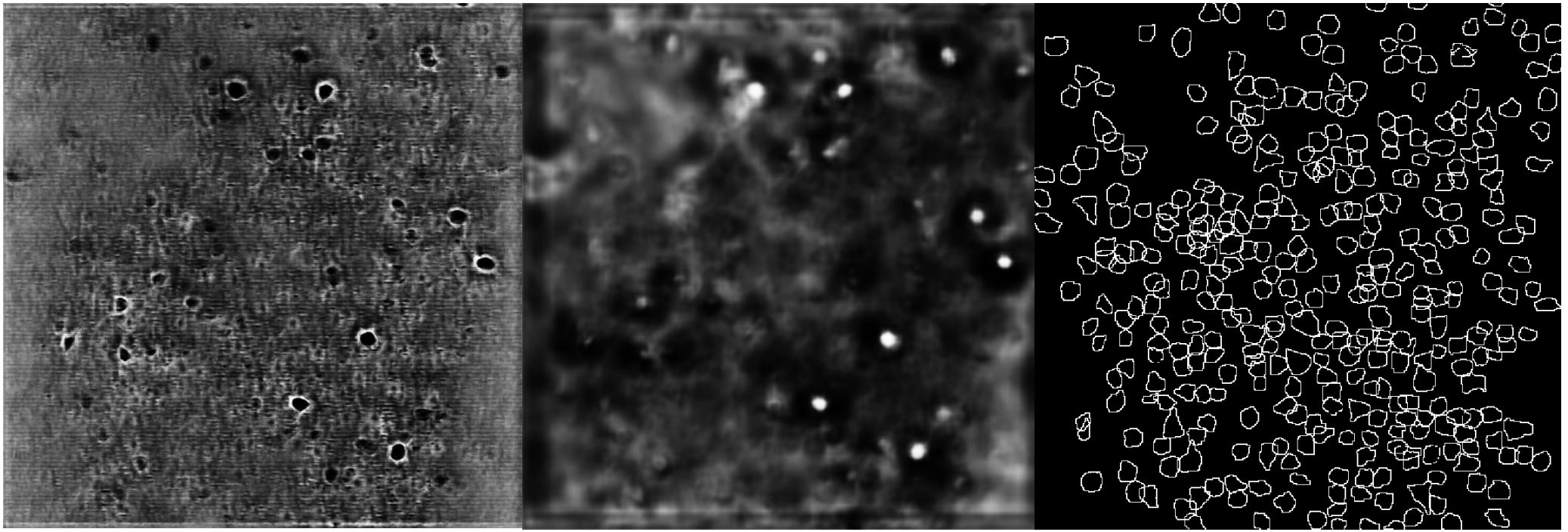


Yet training was difficult



It was beginning to learn

Network output for validation image



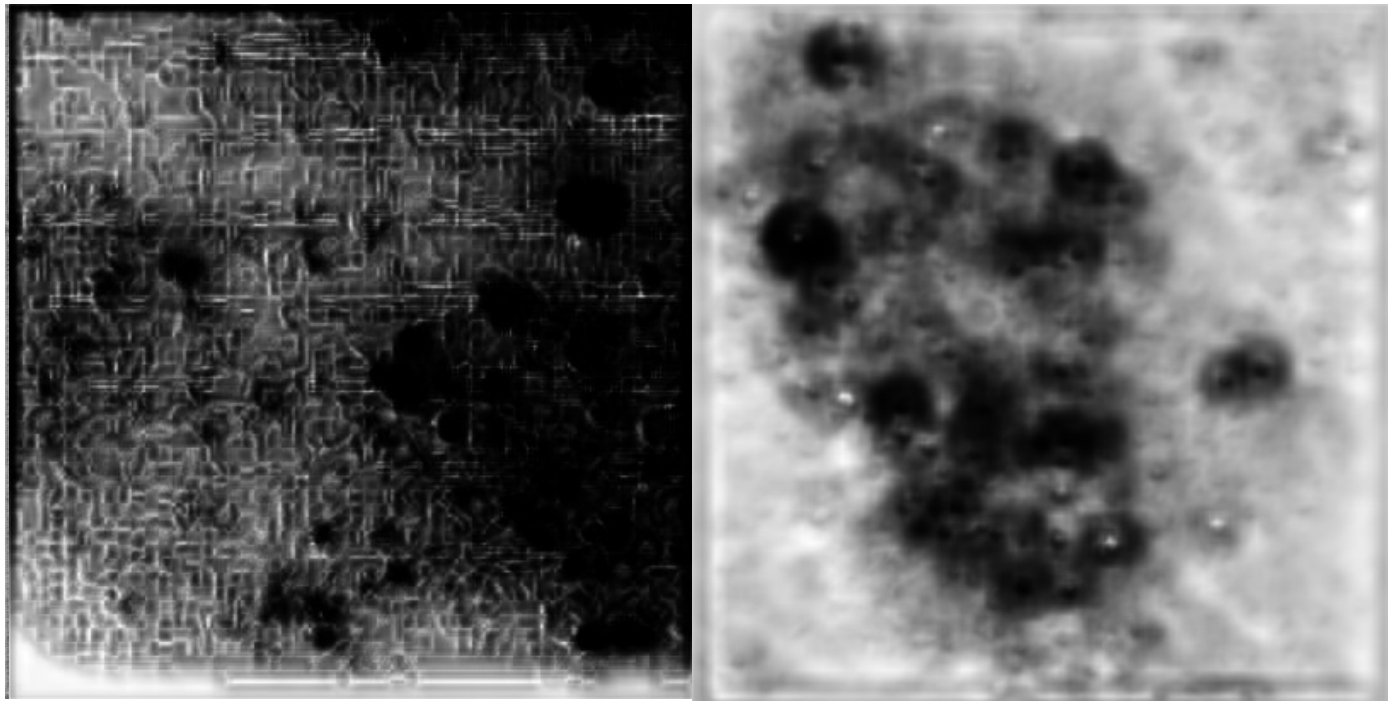
DRIVE

RIMONE

Anotation

It was beginning to learn

“Raw” network output for validation image



DRIVE

RIMONE

Discussion

- DRIVE is beginning to fine-tune for neuron edges.
- Finding blobs with RIMONE does not seem as promising.
- Strong background must be overcome.
- Temporal information must be included.