



# TEAM HASTINGS- CILIA SEGMENTATION

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# INDEX

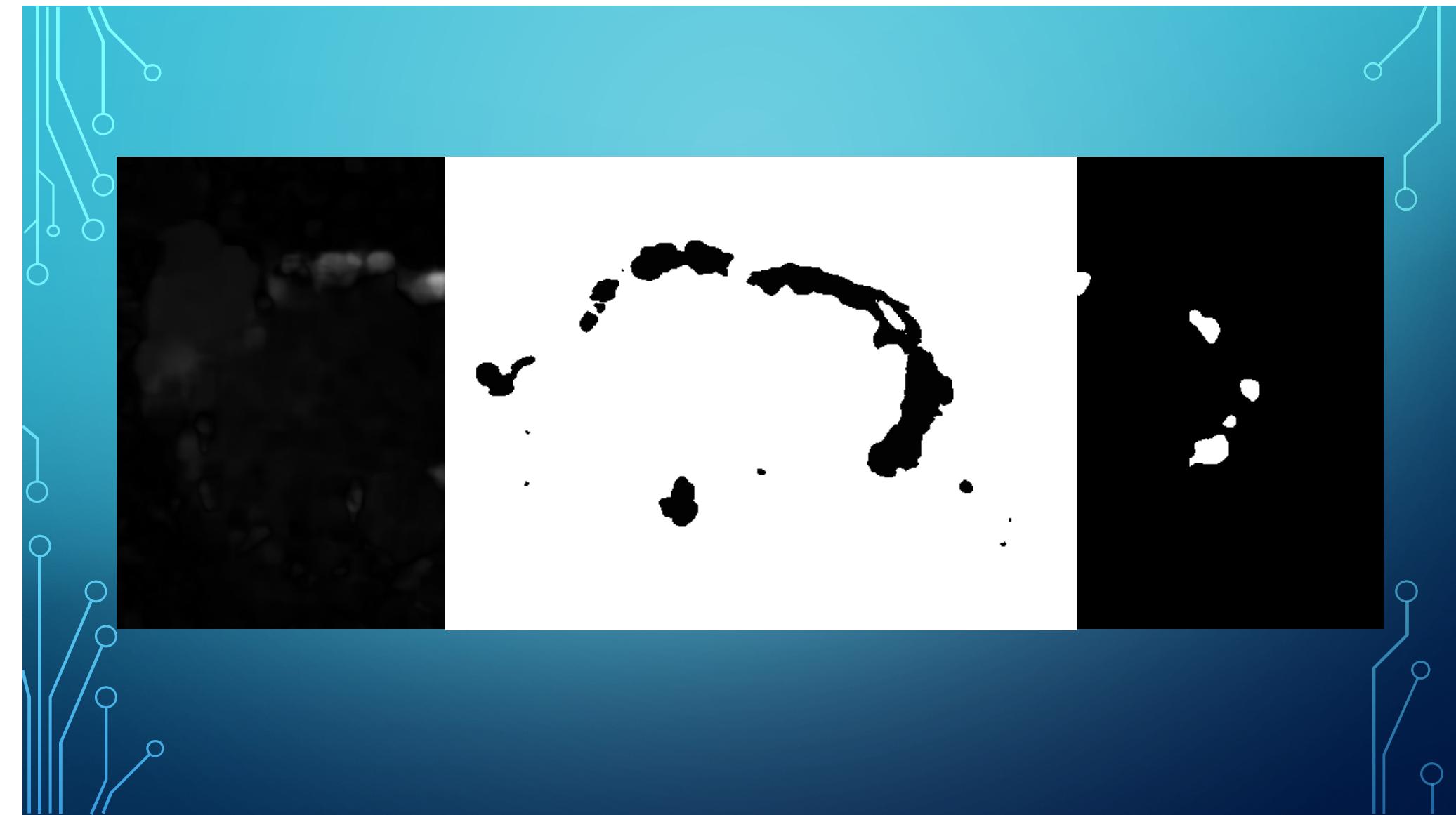
- Optical Flow
- Unet
- Tiramisu



# OPTICAL FLOW

## - OPENCV DENSE OPTICAL FLOW

- SCALABLE, RUNS VERY FAST
- ONLY ABLE TO DETECT MOVING OBJECTS (SOME CILIA ARE NOT MOVING)
- ALSO CELLS ARE MOVING
- MOVING AIR BUBBLES



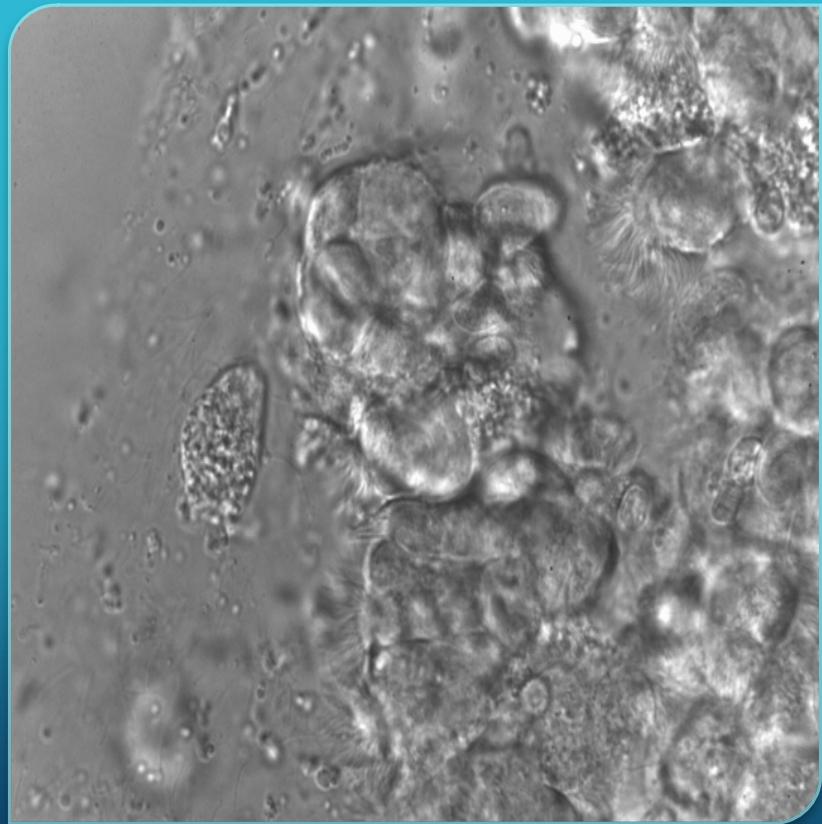
Algorithm	Parameter value	IoU
Optical Flow	threshold = 110	16.02
Optical Flow	threshold = 100	17.73
Optical Flow	threshold = 90	18.97
Optical Flow	threshold = 85	19.34
Optical Flow	threshold = 81	19.48142
Optical Flow	threshold = 80	19.48875
Optical Flow	threshold = 79	19.48135
Optical Flow	threshold = 78	19.47
Optical Flow	threshold = 75	19.40
Optical Flow	threshold = 70	19.00

# UNET

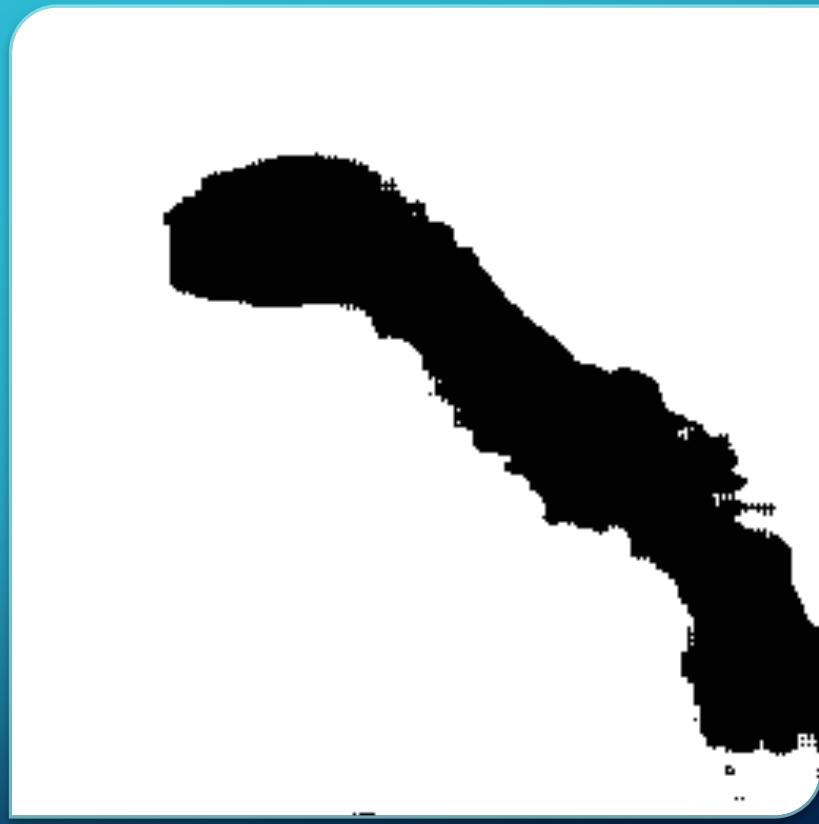
- Minor modification to basic Unet as per the paper:  
<https://arxiv.org/pdf/1707.06314.pdf>
- Added batch normalization after every convolution layer
- Added dropout after every Unet block
- Gave very low score.



TRAINING MASK  
PREDICTED MASK

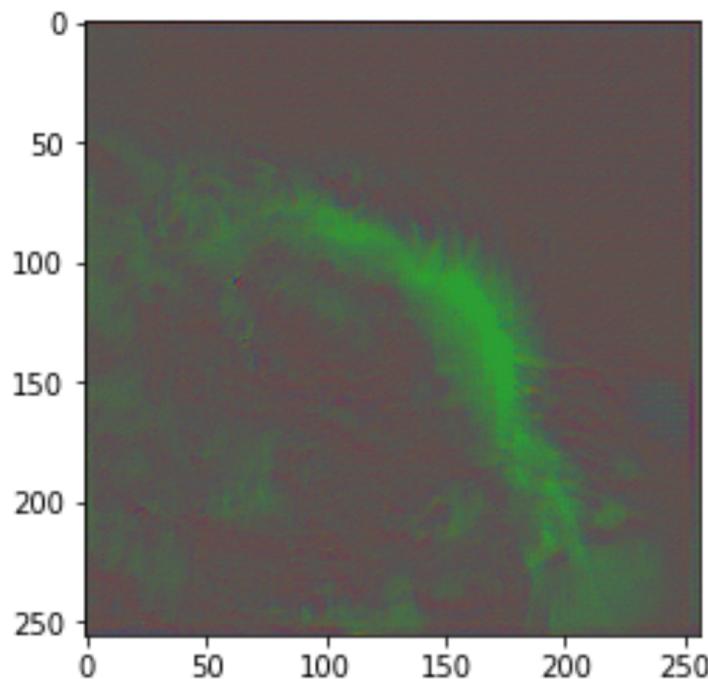
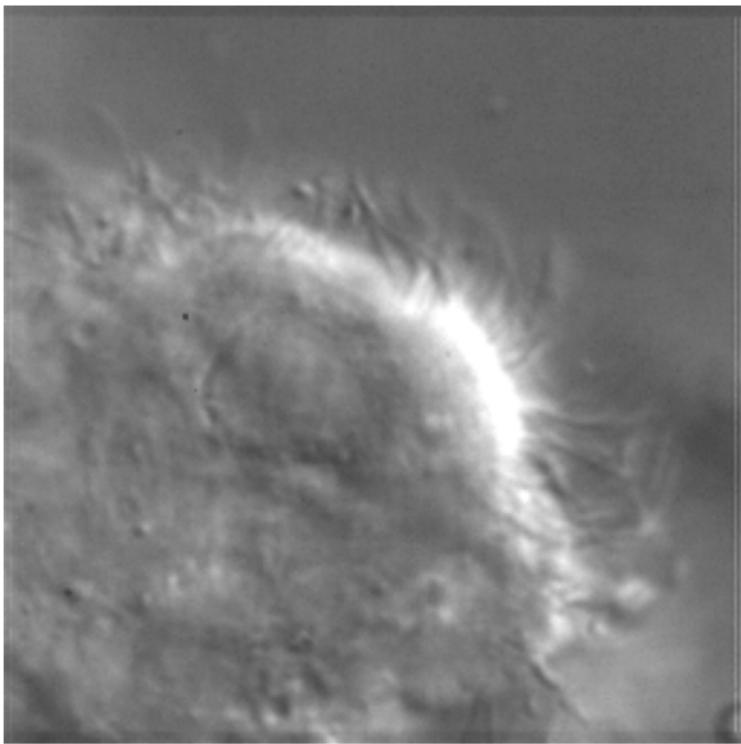


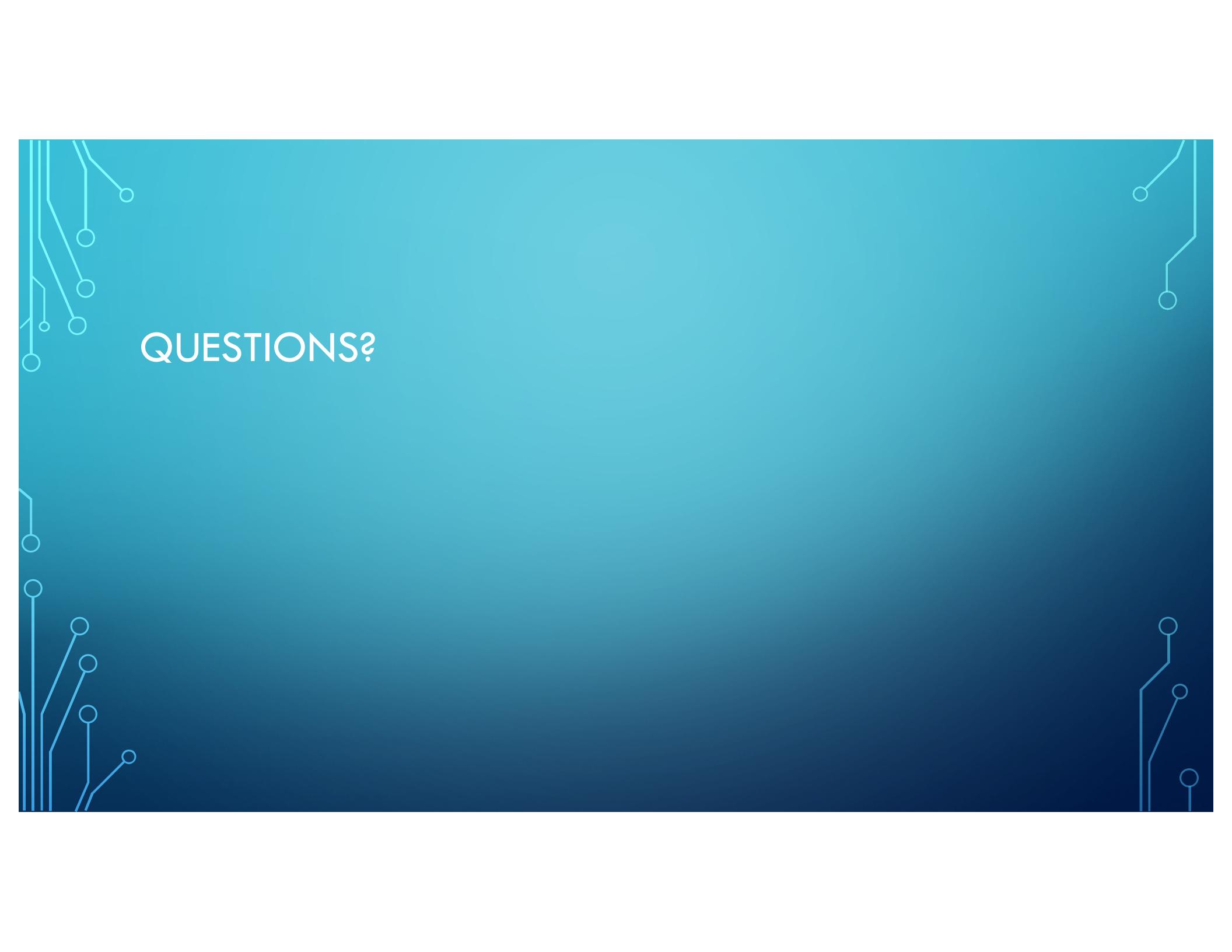
TRAINING IMAGE  
PREDICTED MASK



## TIRAMISU

- We used Jeremy Howard's Tiramisu implementation with slight modification: <https://github.com/fastai/courses/blob/master/deeplearning2/tiramisu-keras.ipynb>
- Preprocessing and post processing same as Unet
- Ran on very small dataset





QUESTIONS?