CSCI 8360 – Project 2
Cilia Segmentation

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Models

Optical Flow

Variance

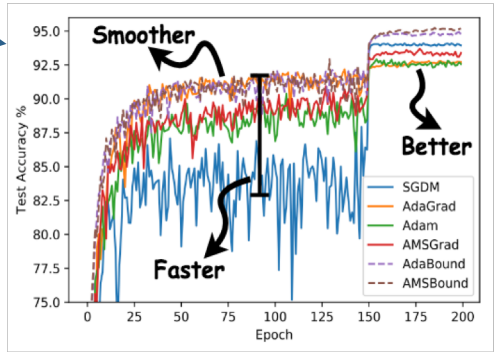
Tiramisu Convolutional Neural Network

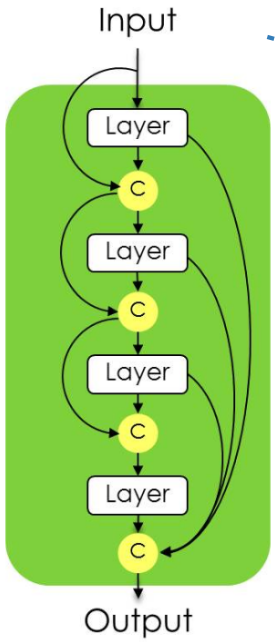
(https://arxiv.org/pdf/1611.09326.pdf)

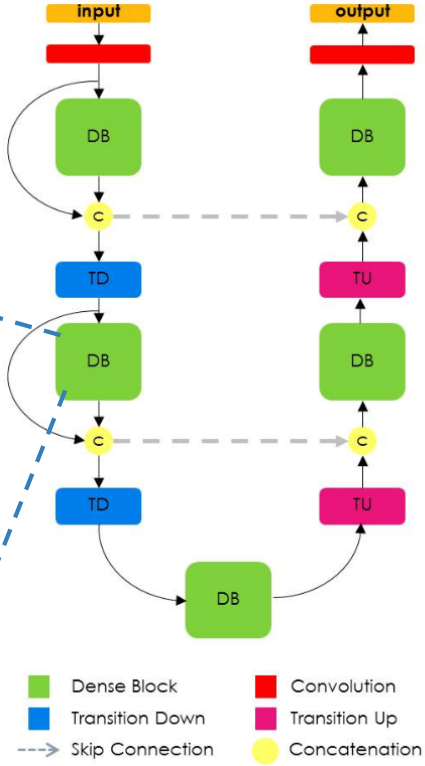
- Brendan Fortuner (https://github.com/bfortuner/pytorch_tiramisuSecond)
- AdaBound (https://github.com/Luolc/AdaBound)

Best Accuracy for each model

- Tiramisu: 40.6%
- Optical Flow: 22.2%
- Variance: 1%





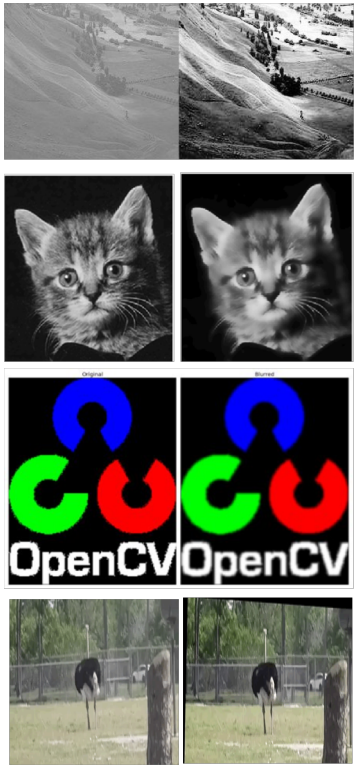


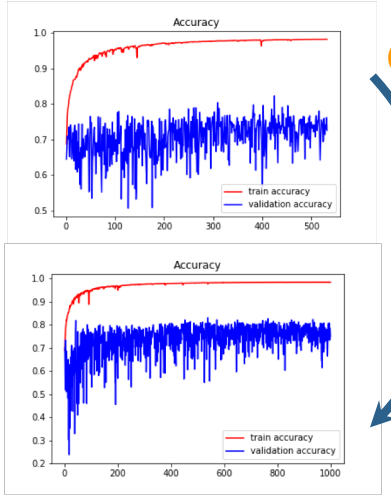
Preprocessing

OpenCV

(https://docs.opencv.org/3.4/index.html)

- Clahe: Equalizer
- Bilateral Filter: Soothing
- Gaussian Blur: Remove Noise
- Video Stabilizing: Remove camera shake





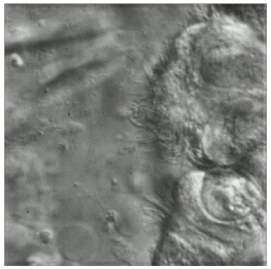
Tiramisu Confidence Grew

Future work

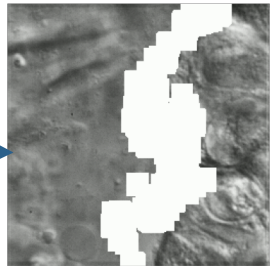
- Using object motion detection techniques
- Focusing on the area of interest
- cropping the image based on existence of Cilia
- Feeding the new input to the segmentation model.

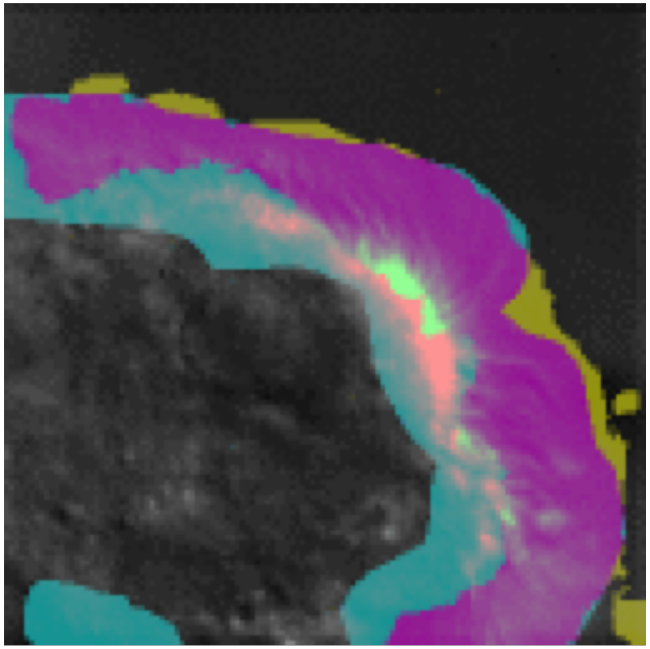
Predicted Mask

Ground truth



Motion detection algorithm
Find contours around the object of interest
Finding threshold





Questions?