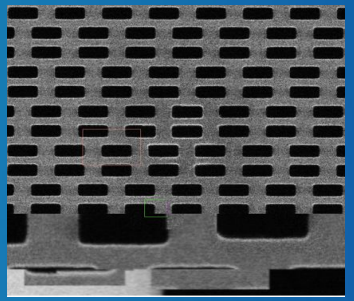
ZEISS

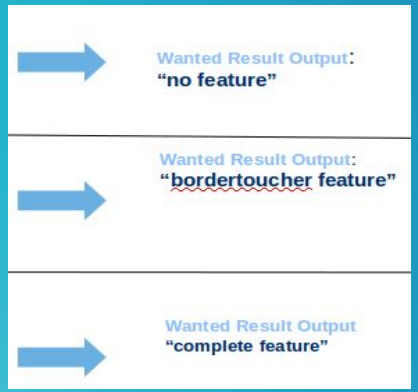
PHOTOMASK CHALLENGE (#2)

V	O	Z	A	P
LADIMIR	LEG	AFAR	SHWATH	RIYAMVADHA

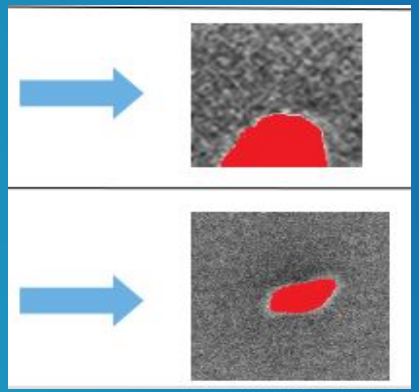
https://devpost.com/software/vozap

CHALLENGE

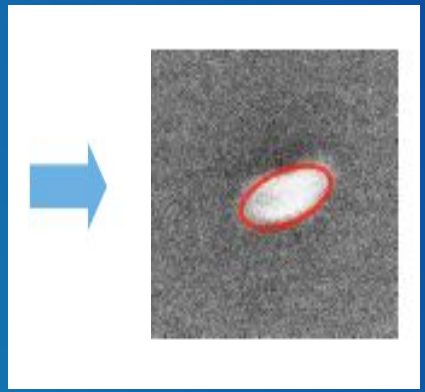




Classification

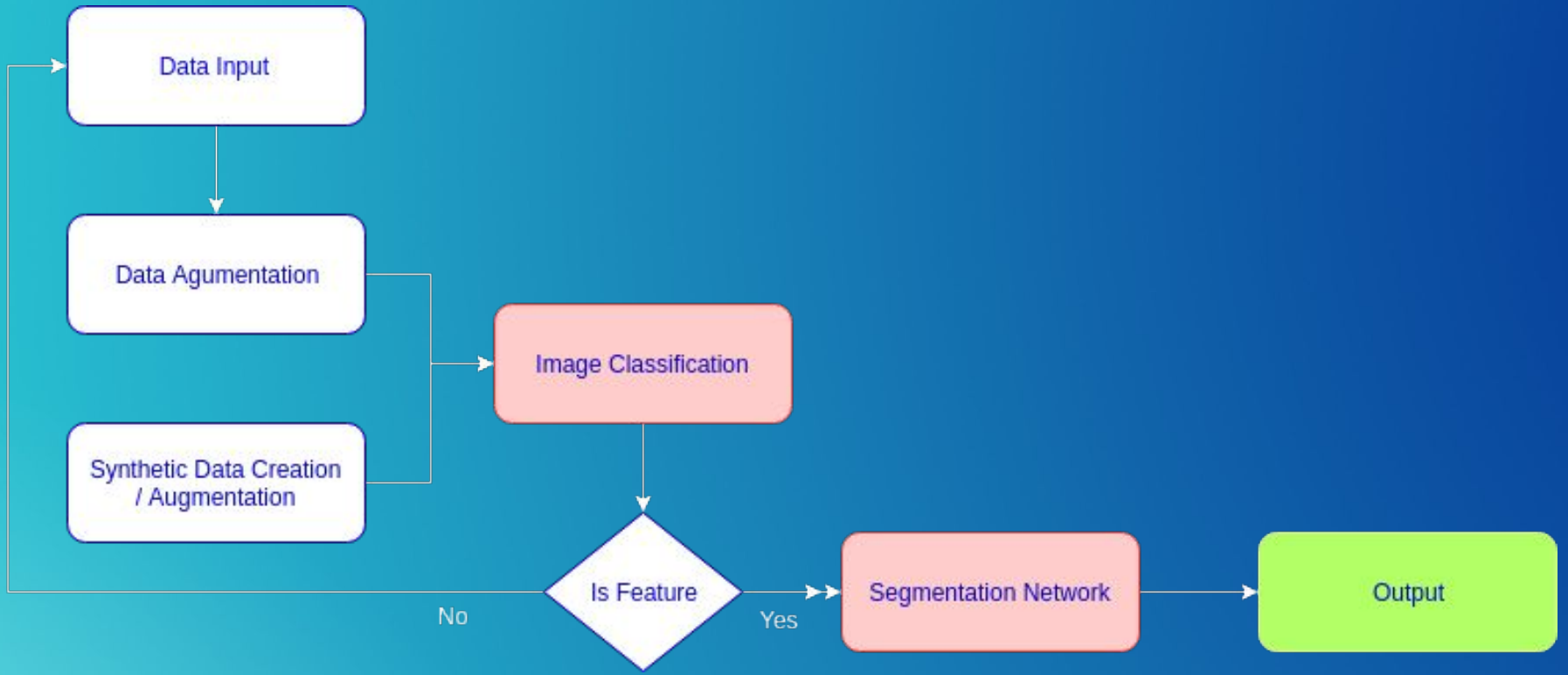


Segmentation



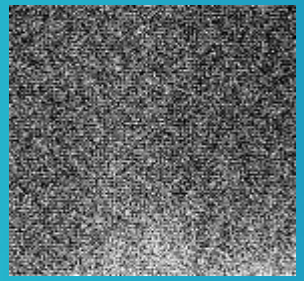
Ellipse Fit

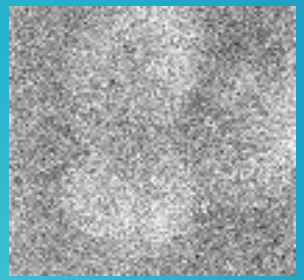
PIPELINE


Data Input
Data Agumentation
Synthetic Data Creation / Augmentation
Image Classification
Is Feature
No
Yes
Segmentation Network
Output

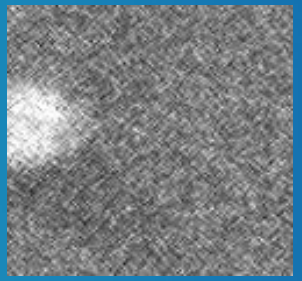
DATA

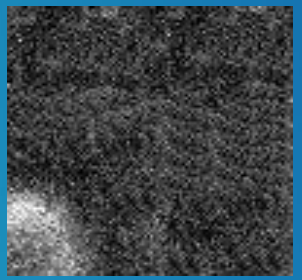
NO FEATURE



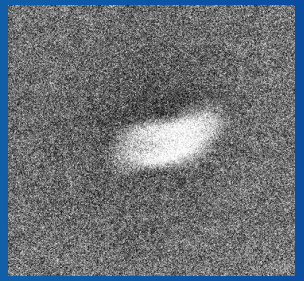


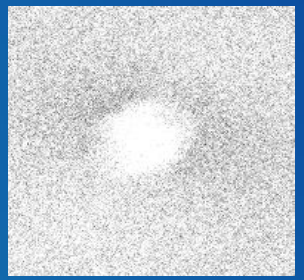
BORDERTOUCHER FEATURE





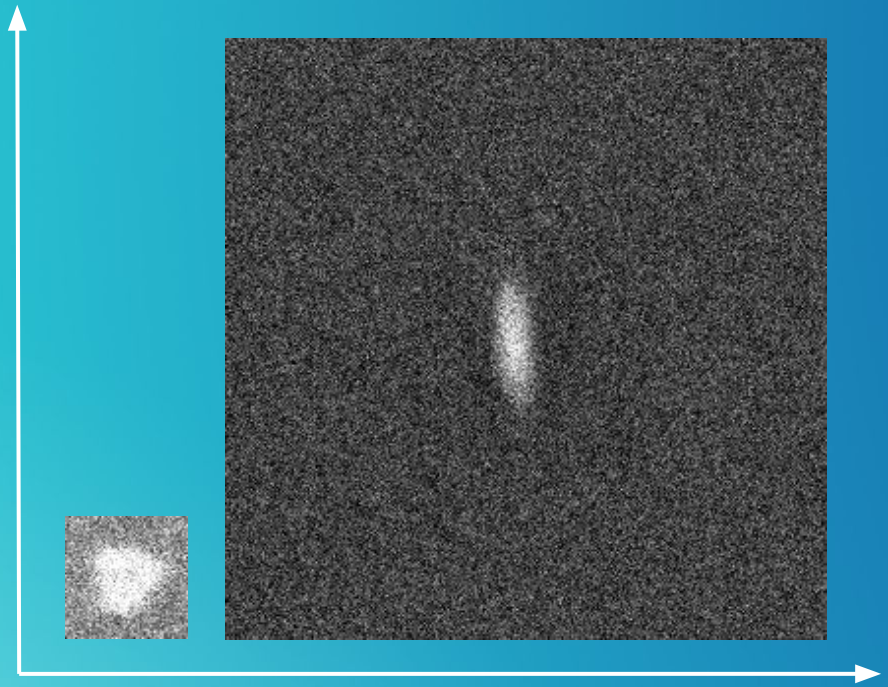
COMPLETE FEATURE



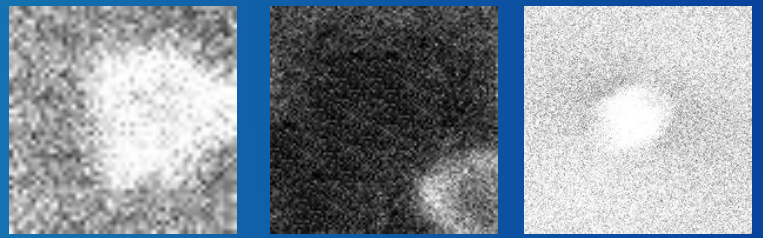


DATA

Input Size



Input brightness?



Dataset size?

111 images!

LABELING

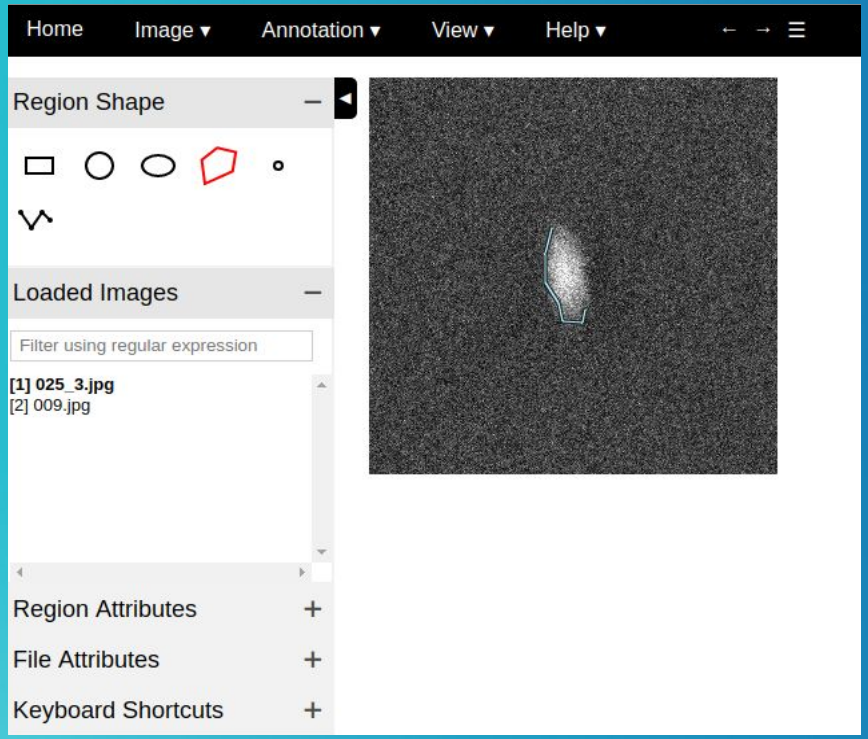

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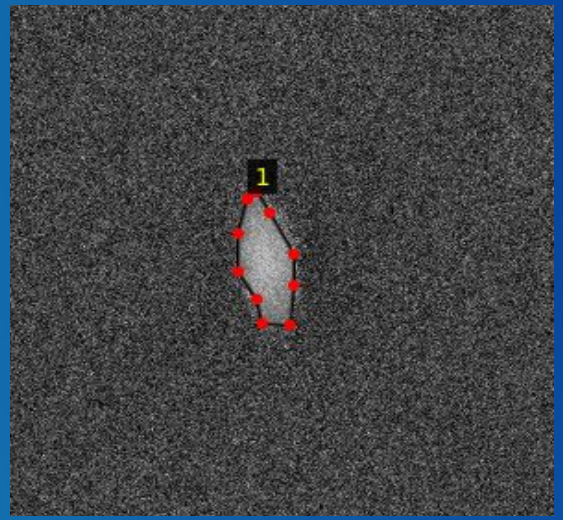
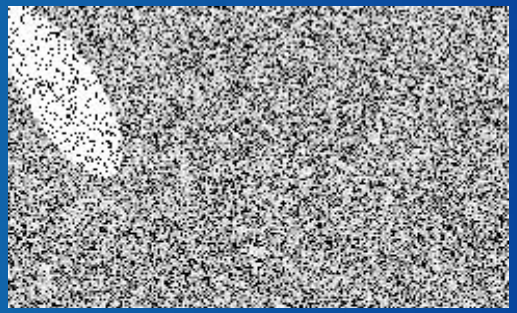
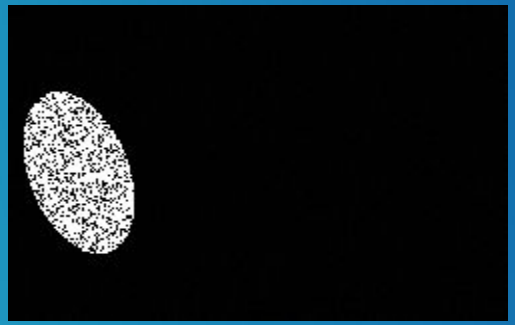
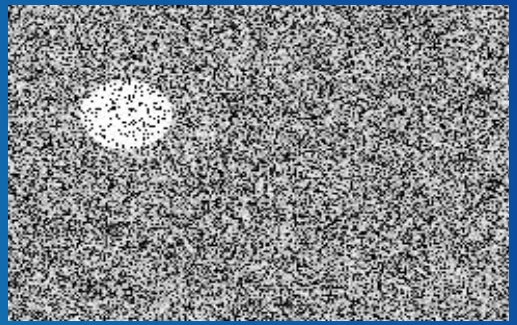
Image ▾
Annotation ▾
View ▾
Help ▾
Region Shape
Loaded Images
Filter using regular expression
[1] 025_3.jpg
[2] 009.jpg
Region Attributes
File Attributes
Keyboard Shortcuts


1

AUGMENT / SYNTHETIC DATA

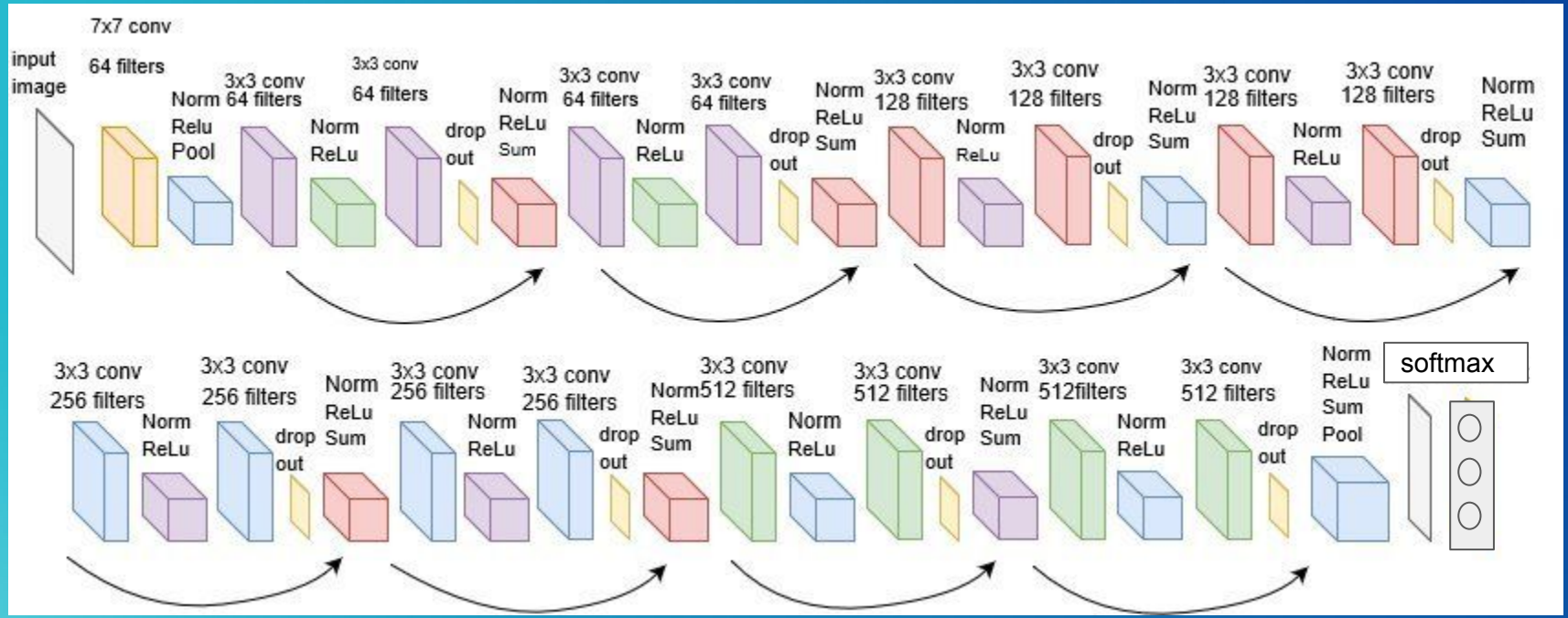




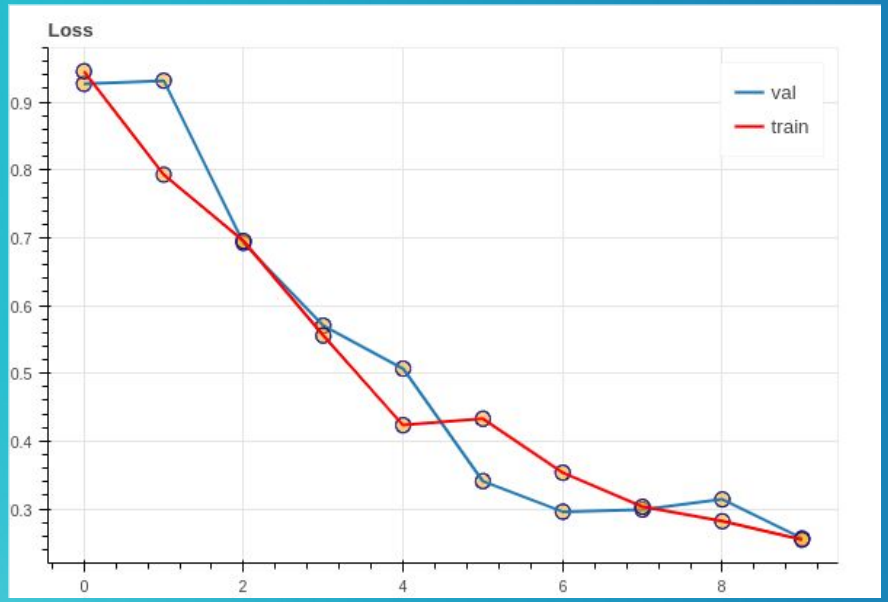



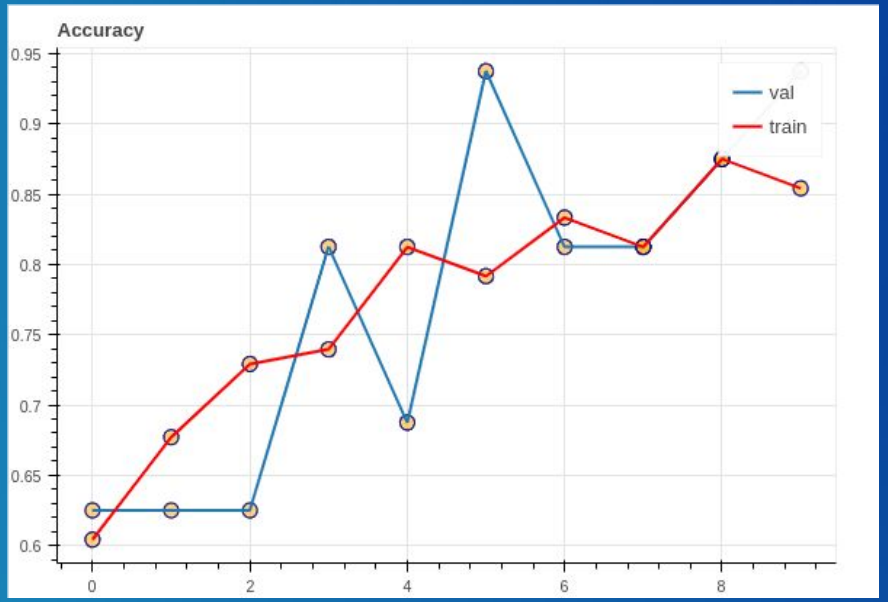
NN #1 ARCHITECTURE: CLASSIFICATION TASK

Resenet-18

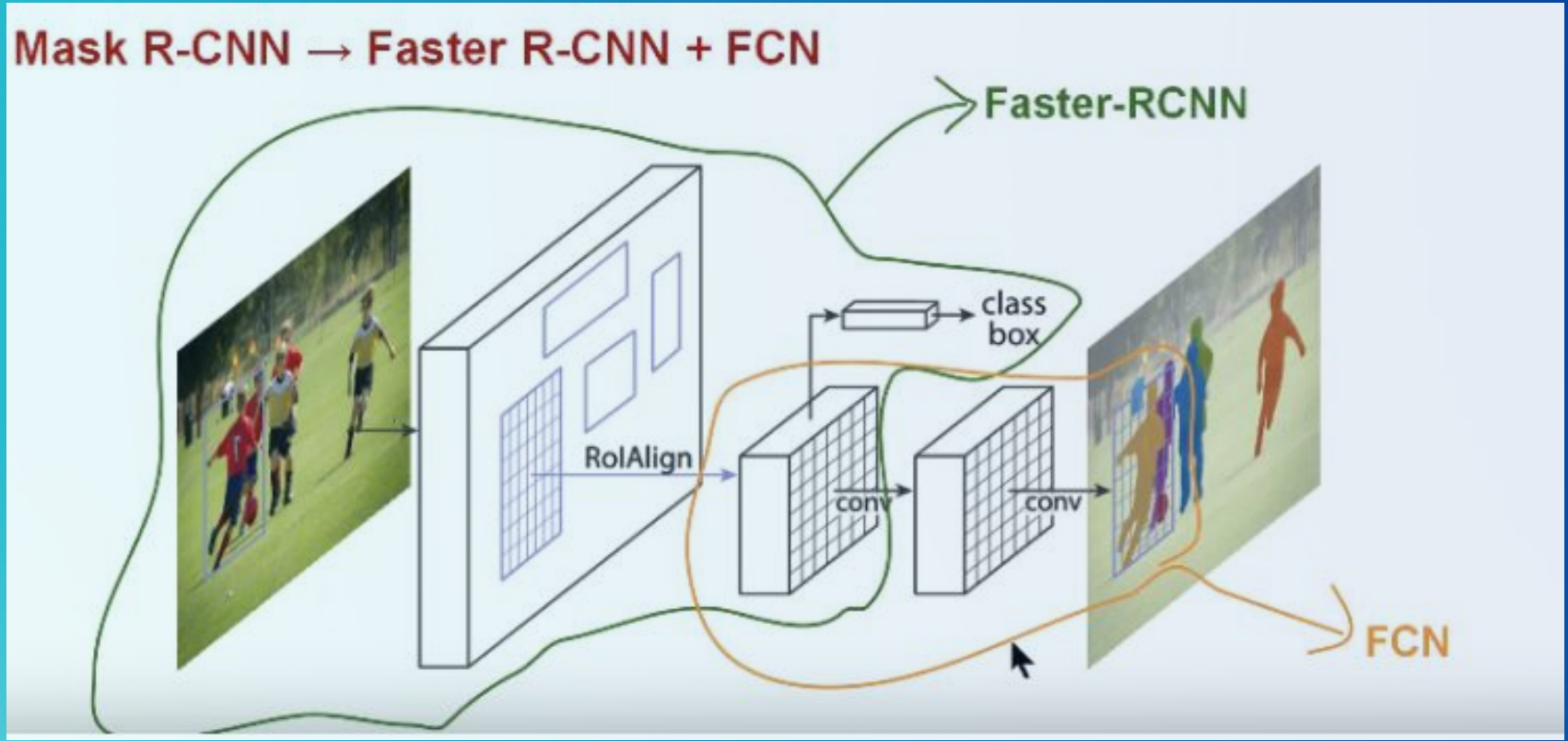


RESULTS: CLASSIFICATION

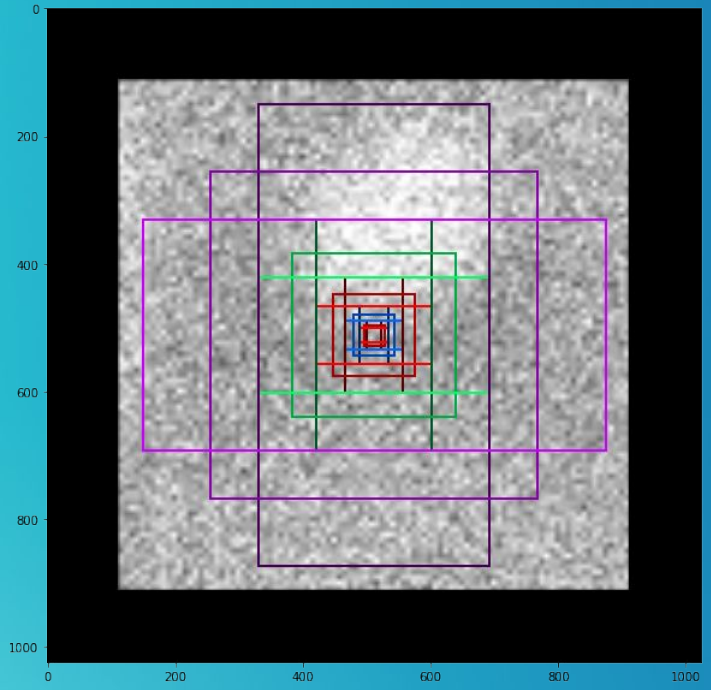


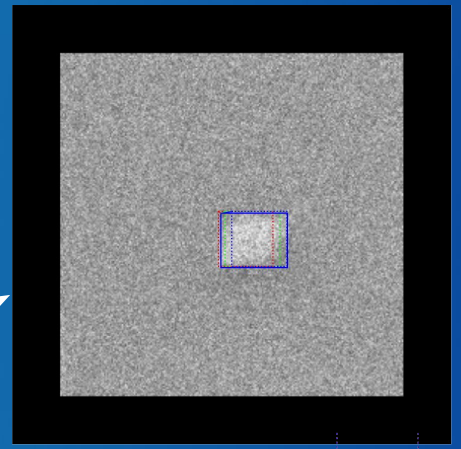


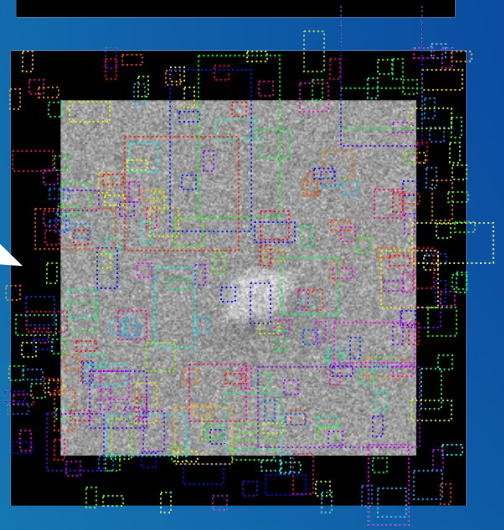
NN #2 ARCHITECTURE: SEGMENTATION TASK



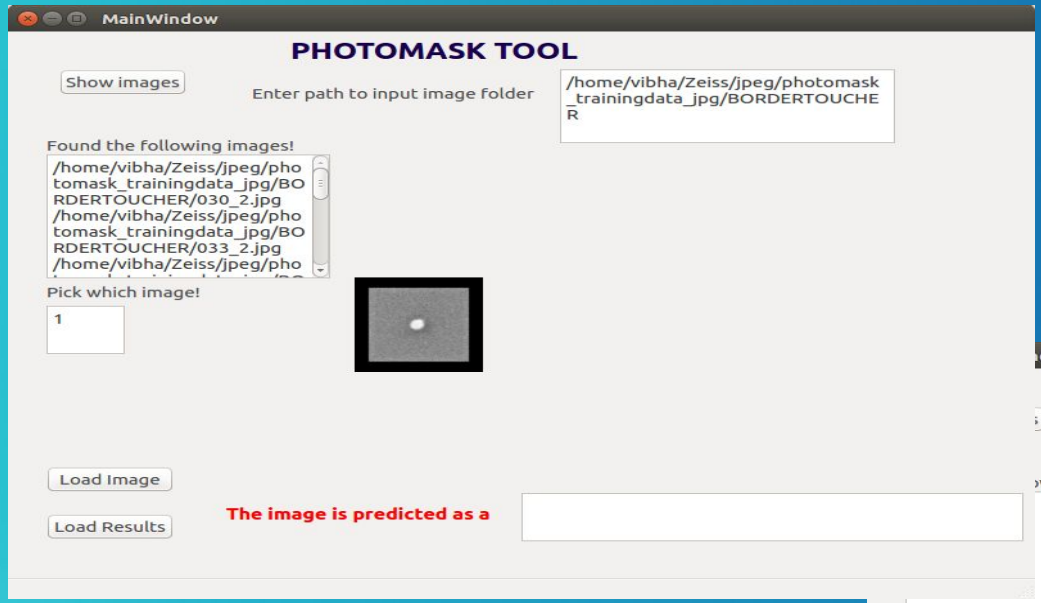
RESULTS: SEGMENTATION

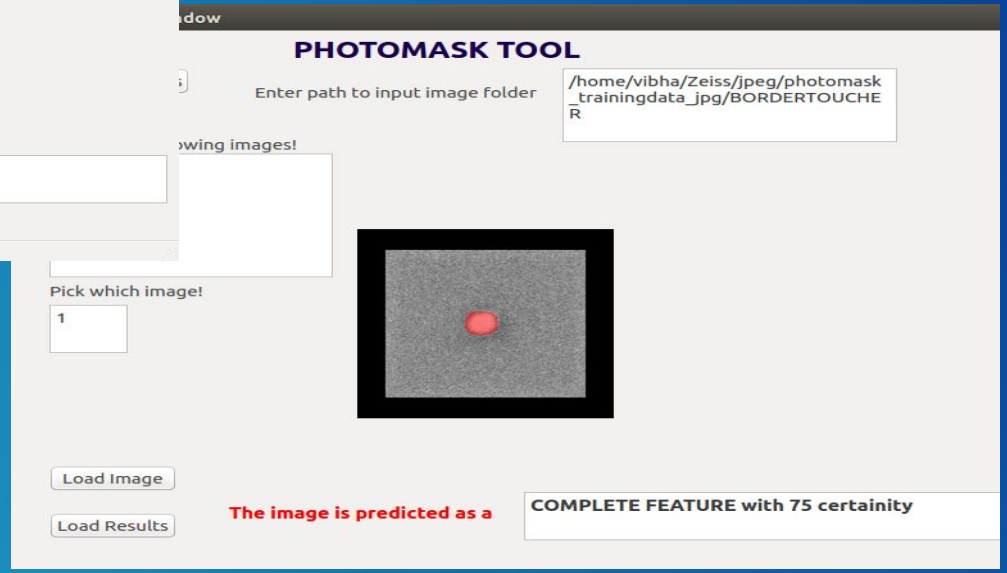






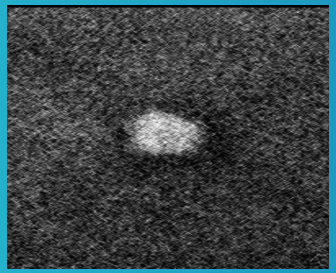
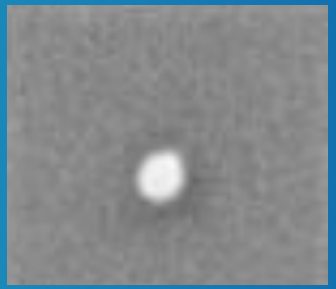
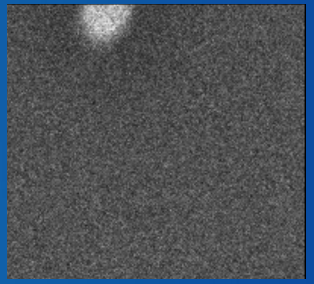
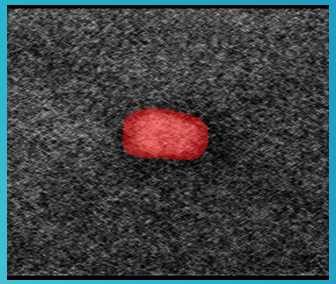
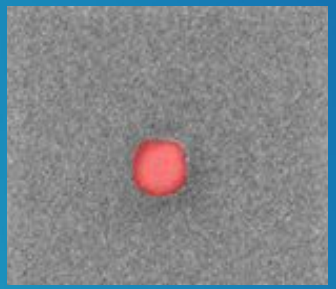
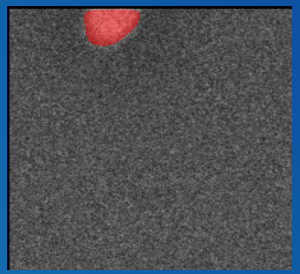
OUR VISUAL INTERFACE





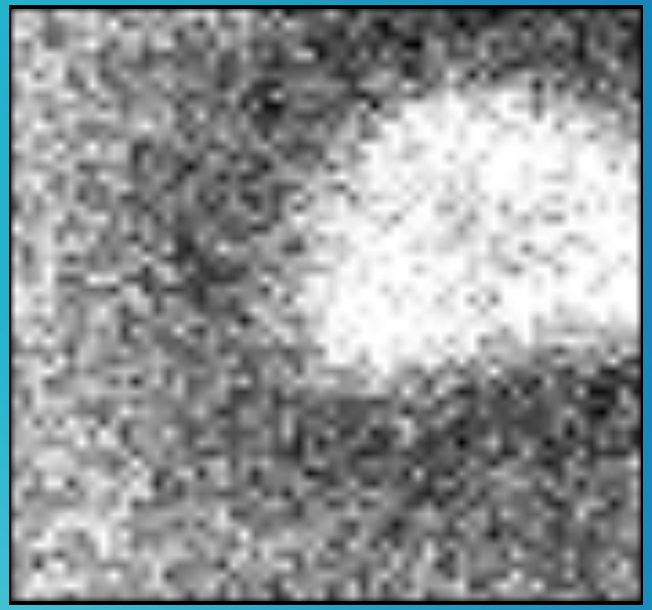
RESULTS: SEGMENTATION

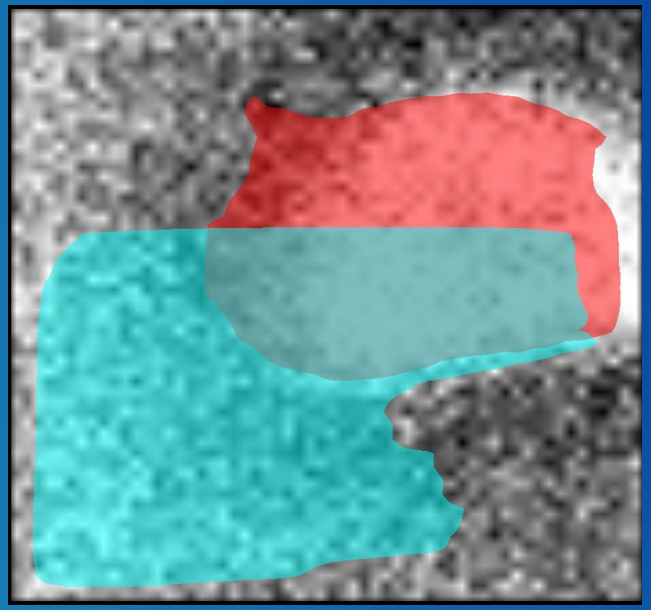
TRUE POSITIVES

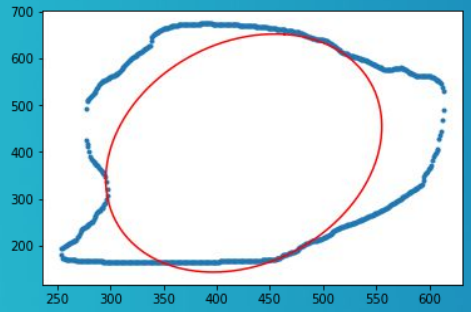
RESULTS: SEGMENTATION

FALSE POSITIVES



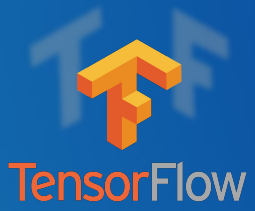


Eclipse



$$\mathbf{x} = \mathbf{z} + Q(\alpha)\mathbf{x}', \quad \mathbf{x}' = \begin{pmatrix} a\cos\varphi \\ b\sin\varphi \end{pmatrix}, \quad Q(\alpha) = \begin{pmatrix} \cos\alpha & -\sin\alpha \\ \sin\alpha & \cos\alpha \end{pmatrix}.$$

TOOLS / ENVIRONMENT



24

HOURS

5

TEAMMATES

1500+

SYNTHETIC AND LABELED IMAGES!

2

NEURAL NETWORKS

1

EFFICIENT SOLUTION

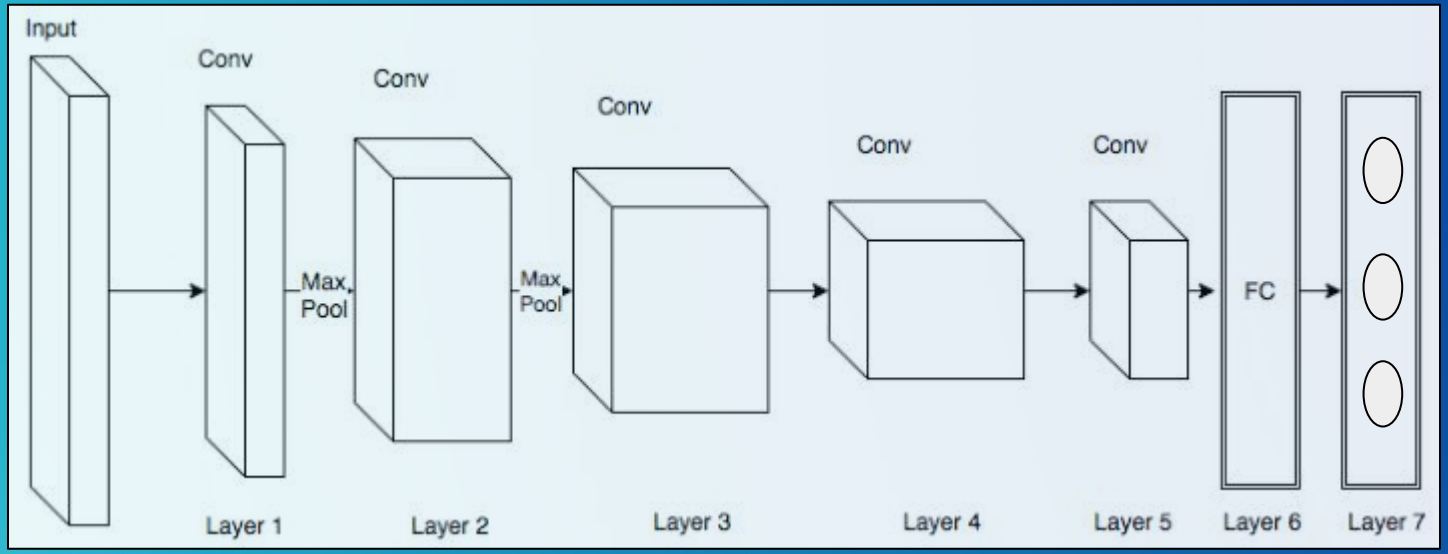
V O Z A P

https://devpost.com/software/vozap

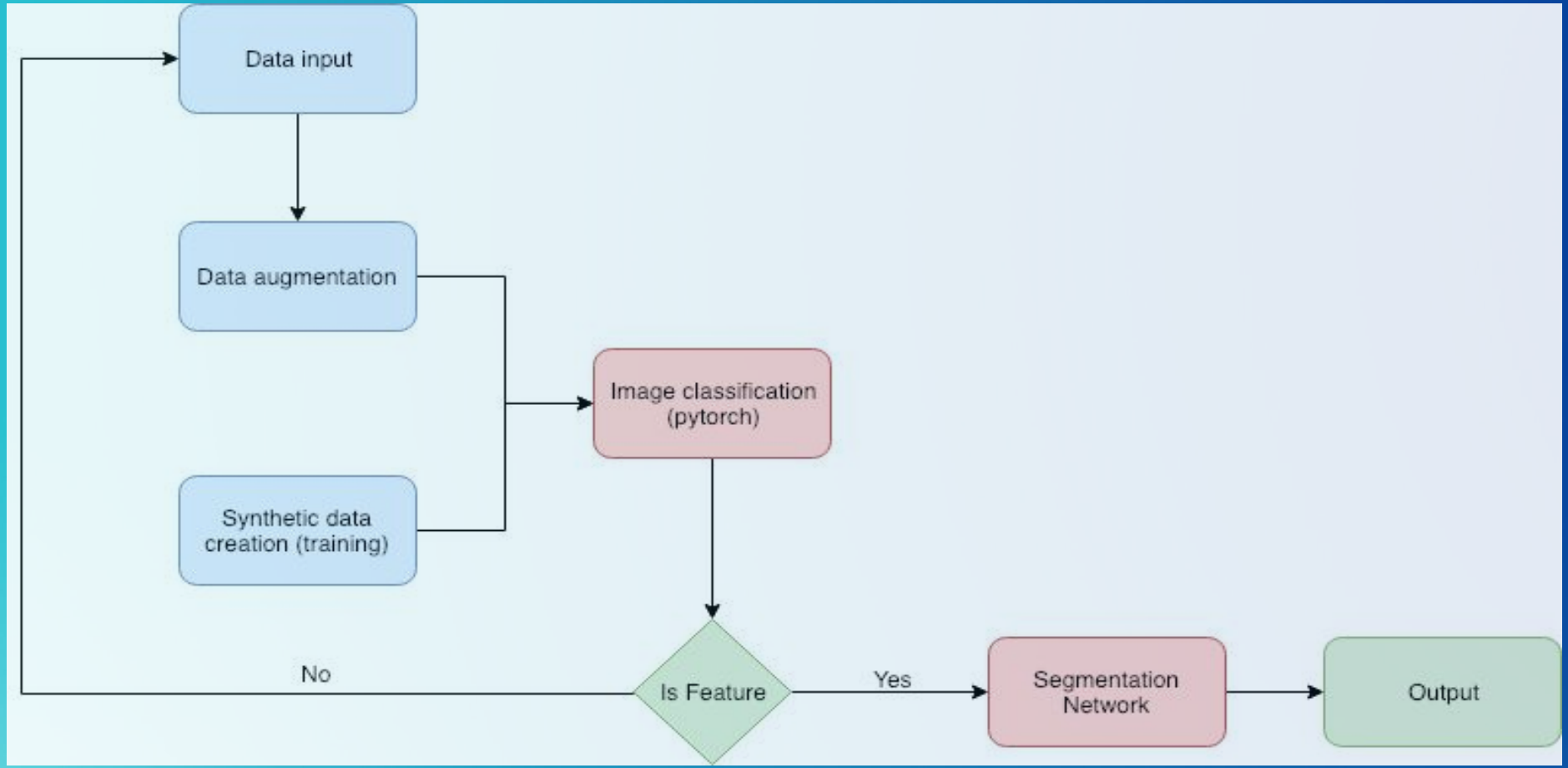
Backup Slides

NN #1 ARCHITECTURE: CLASSIFICATION TASK

VGG-11

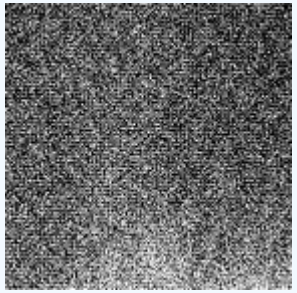


PIPELINE

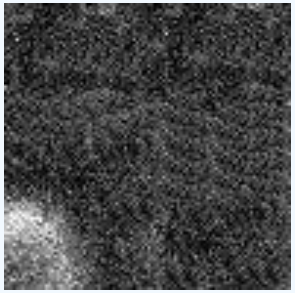

Data input
Data augmentation
Synthetic data creation (training)
Image classification (pytorch)
Is Feature
No
Yes
Segmentation Network
Output

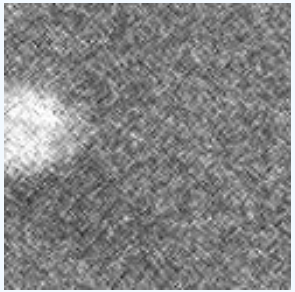
DATA

NO FEATURE

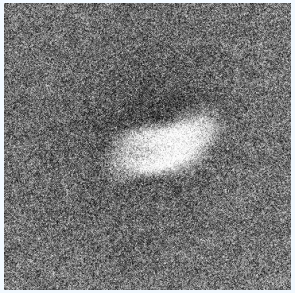


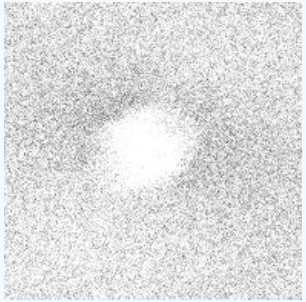
BORDER FEATURE



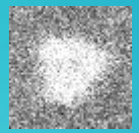


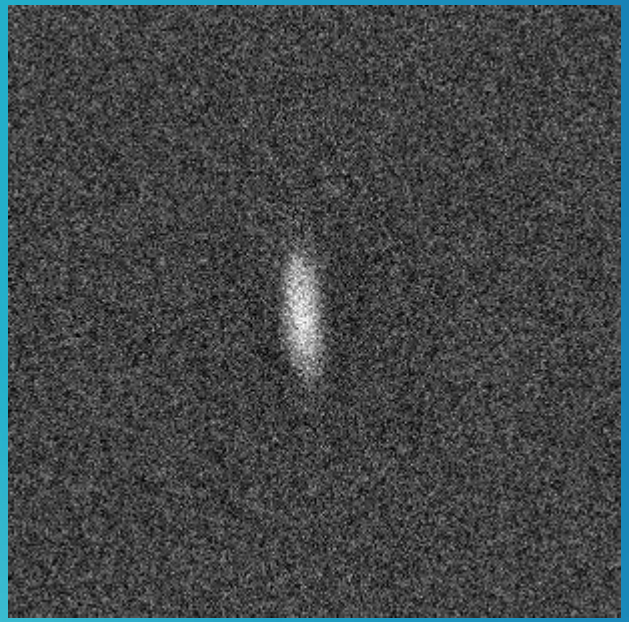
COMPLETE FEATURE



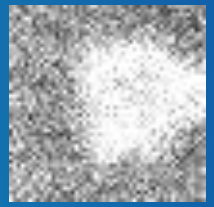


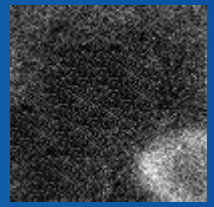
Input Size?

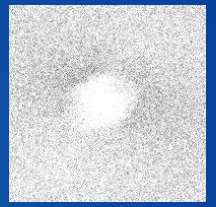




Input brightness?





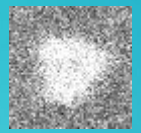


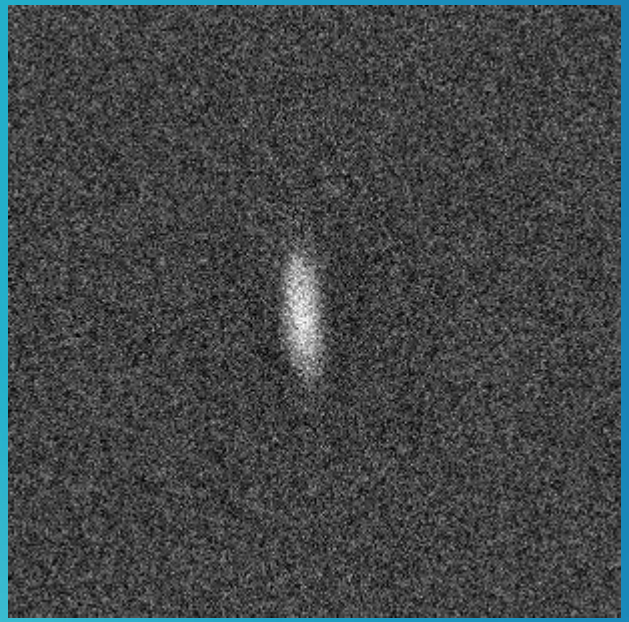
Dataset size?

111 images

DATA

Input Size?





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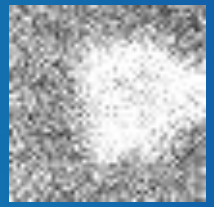
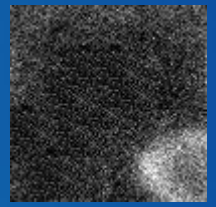
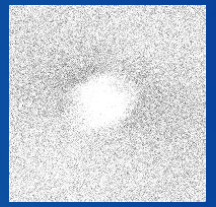


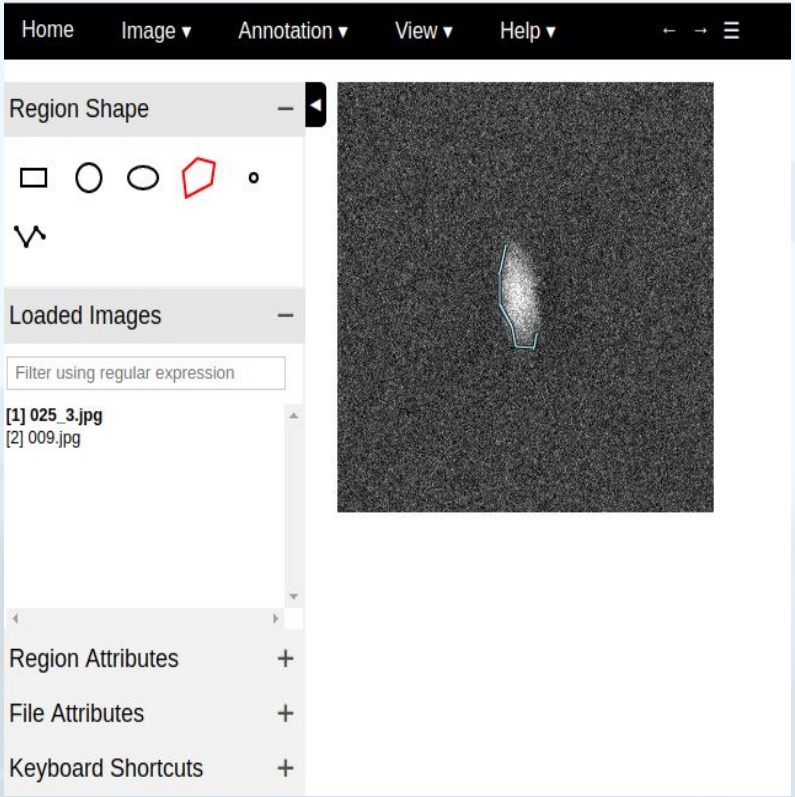




Dataset size?

111 images

LABELING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Region Shape
Loaded Images
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[2] 009.jpg
Region Attributes
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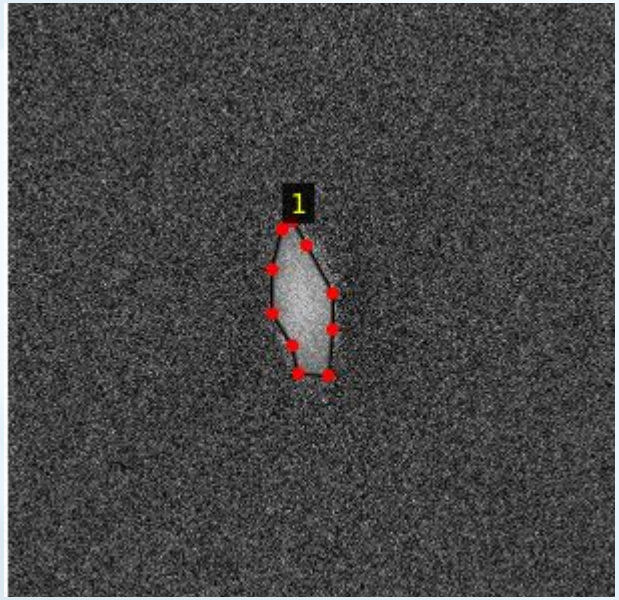
Keyboard Shortcuts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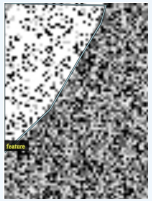
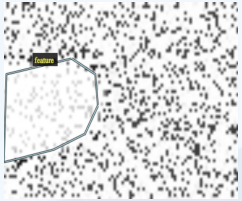
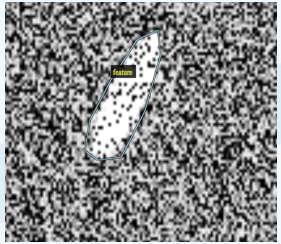
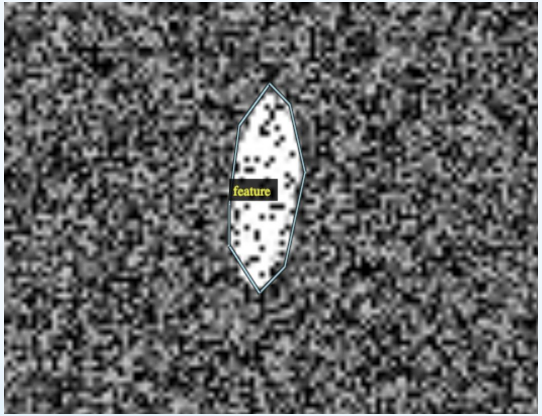
LABELING









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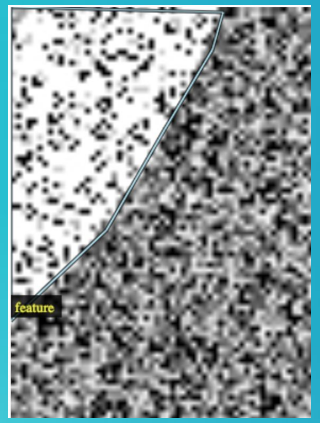
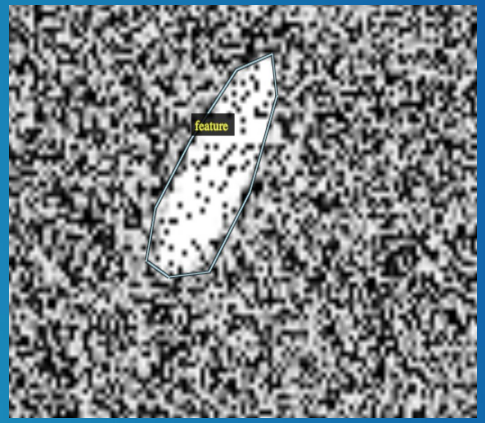
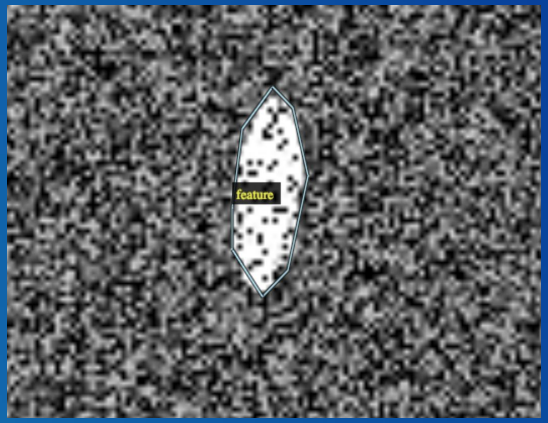
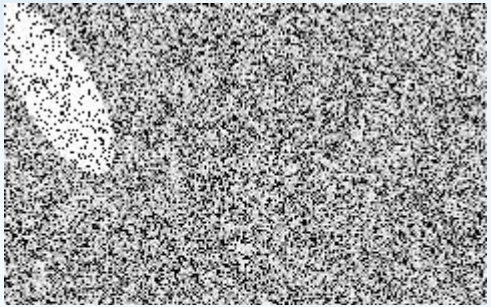


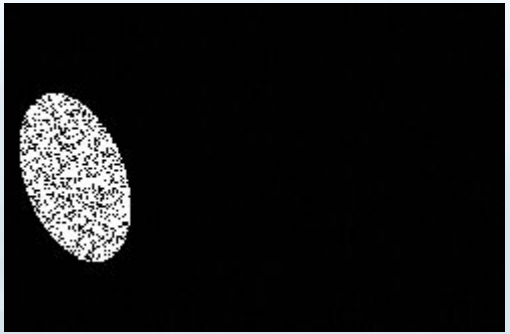
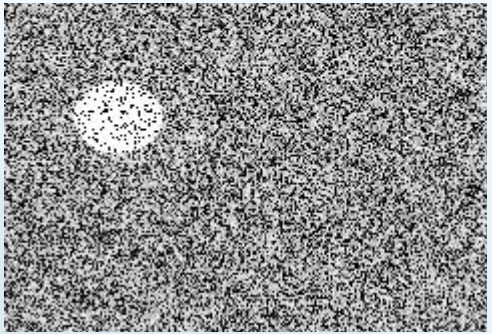




AUGMENTATION / SYNTHETIC DATA

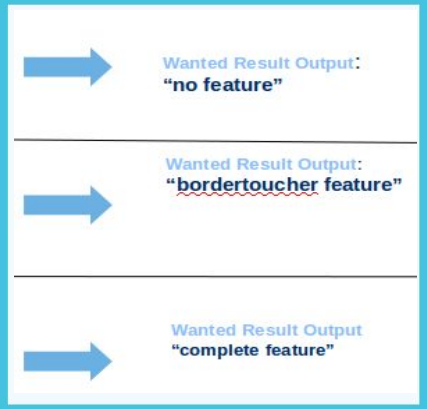




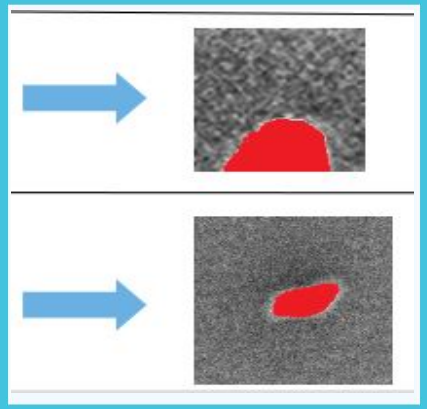



VOZAP

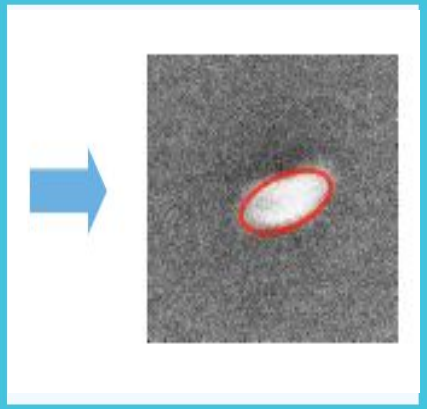
CHALLENGE



Classification



Segmentation



Ellipse fit


24
HOURS
5
TEAMMATES
1500+
SYNTHETIC AND LABELED IMAGES!
1
EFFICIENT SOLUTION

ABOUT AZURE

RESULTS: PART 1

RESULTS: PART 2