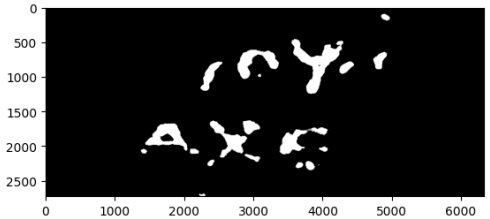
Ink Detection

The goal is to detecting ink from 3D X-ray scans and reading the contents. Due to the heat of the volcano, the scrolls were carbonized, and are now impossible to open without breaking them. We will try to find the best model to get the maximum accuracy.

Results

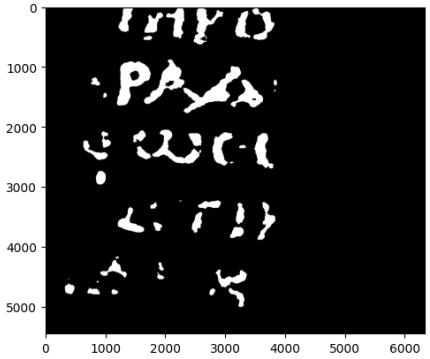
	LR	Loss	M	Optimizer	Score	Conclusions
ResNet18	0.00001	BCEWithLogitsLoss	0.6	Adam	0	Next page →
ResNet34	0.00001	BCEWithLogitsLoss	0.6	Adam	0	Next page →
ResNet50	0.0001	BCEWithLogitsLoss	-	Adam	0	-
ResNet101	0.0001	BCEWithLogitsLoss	0.9	Adam	Failed	-
ResNet152	0.0001	BCEWithLogitsLoss	0.9	Adam	Failed	Overfitting after 3 epocs.
ResNet101_32x_4d	0.0001	DiseLoss	0.9	Adam	0	-
Efficientnet-b5	0.0001	BCEWithLogitsLoss	0.9	Adam	0.28	

ResNet18

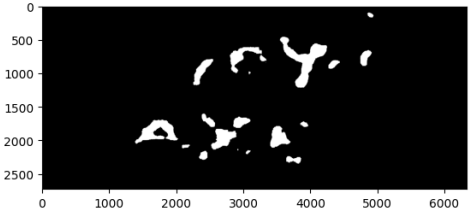


```
100%|██████████| 13/13 [00:12<00:00,  1.04it/s]
100%|██████████| 10805/10805 [45:28<00:00,  3.96it/s]

mask_count_min: 1.0
```

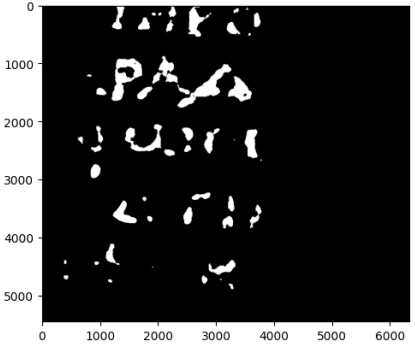


ResNet34



```
100%|██████████| 13/13 [00:13<00:00,  1.01s/it]
100%|██████████| 10805/10805 [48:50<00:00,  3.69it/s]

mask_count_min: 1.0
```

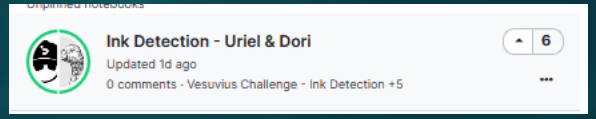


Results

	LR	Loss	M	Optimizer	Score	Conclusions
ResNet18	0.0001	BCEWithLogitsLoss	-	Adam	0	-
ResNet34	0.0001	BCEWithLogitsLoss	-	Adam	0	-
ResNet50	0.0001	BCEWithLogitsLoss	-	Adam	Failed	-
Inception-V4	0.0001	BCEWithLogitsLoss	-	Adam	Failed	Overfitting
ResNet151	0.0001	BCEWithLogitsLoss	-	Adam	0	-

Base Notebook

50%



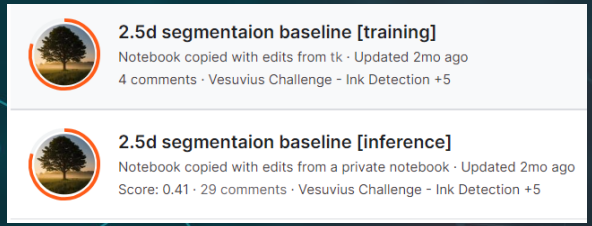
- Show the data
- Create Dataset Object
- Graph functions

30%

- Gaussian distribution
- Take specific layers
- cutting boundary pixels
- Reset abnormal pixels

Fragment	Slices	Ink Peak
Fragment 1	21-34	65
Fragment 2	25-38	88
Fragment 3	20-33	77

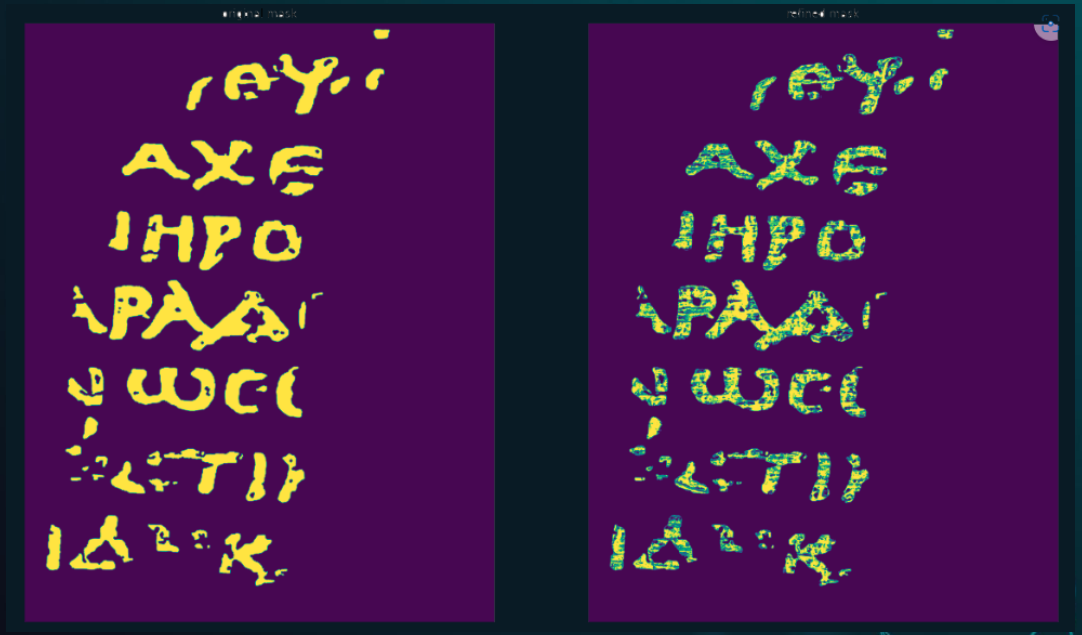
20%



- Test and submission
- RLE

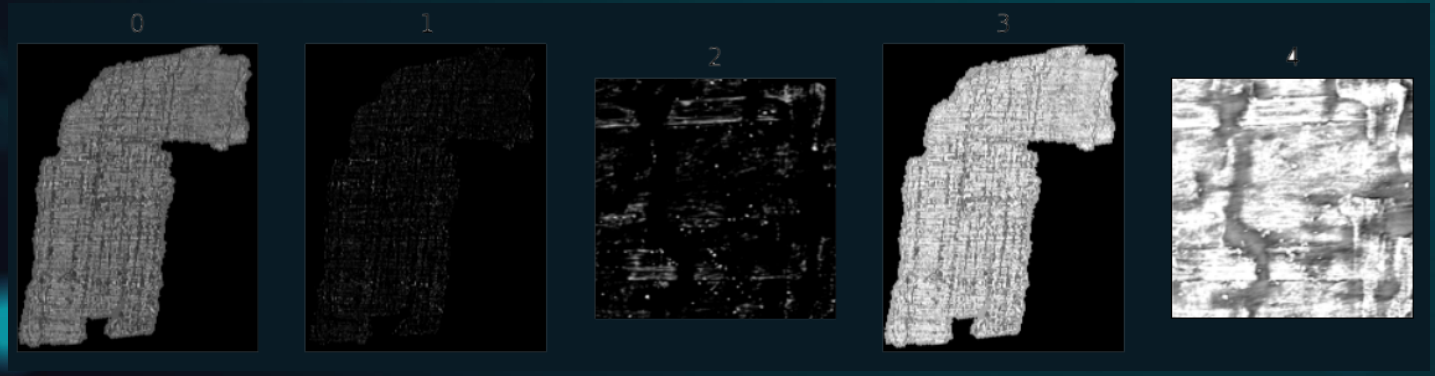
What we do ?

- **1** Reset abnormal pixels



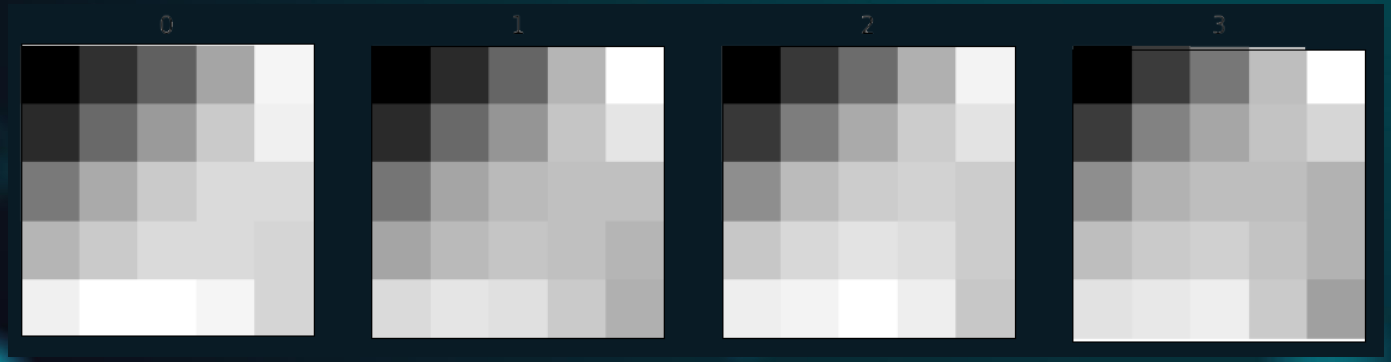
What we do ?

- **2** Clipping Pixeles



What we do ?

- **3** augmentation that does the opposite of max polling



What we do ?

- **4** Focused on the inner part of the fragment.

Worked	Didn't work
Creating the base notebook.	DiseLoss - Negative loss
Clipping the fragment pixels to the correct ink peak.	The opposite of max polling - RAM Problem.
Reset abnormal pixels	SKLearn Algorithm.
ResNet18/34	ResNet101/152
Local Submission (Visual text)	Submission (Score 0/ Failed)

What we learn ?

1. 3D Segmantations Volumes
2. Summary course
3. Impressions of models
4. Augmentataion