



SIMPLE PRESENTATION FOR COMPETITION HUBMAP + HPA

SEGMENT MULTI-ORGAN FUNCTIONAL TISSUE UNITS

MINGZIRUI WU

BOTAO JIANG



CONTINUE WITH FUTURE WORK

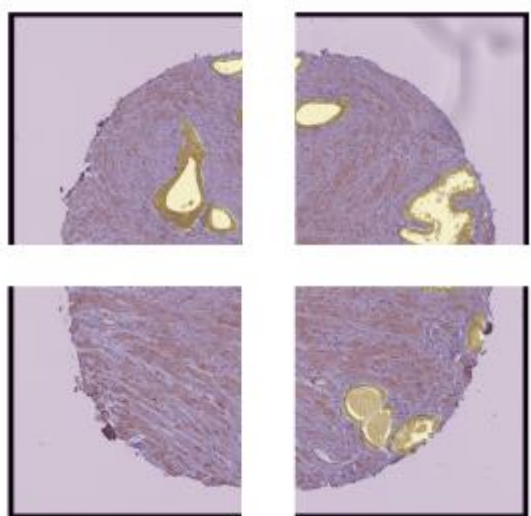
- Optimize inference code
- Efficient Net with best Augmentation Strategy
- Unexpected problem with 512x512 Dataset

OPTIMIZE INFERENCE CODE

- Key Point: Change parameter with Dataset Processing Code.
- Mean, Std
- Same processing method with dataset.

GENERATE DATASET

- Different parameter, different result.

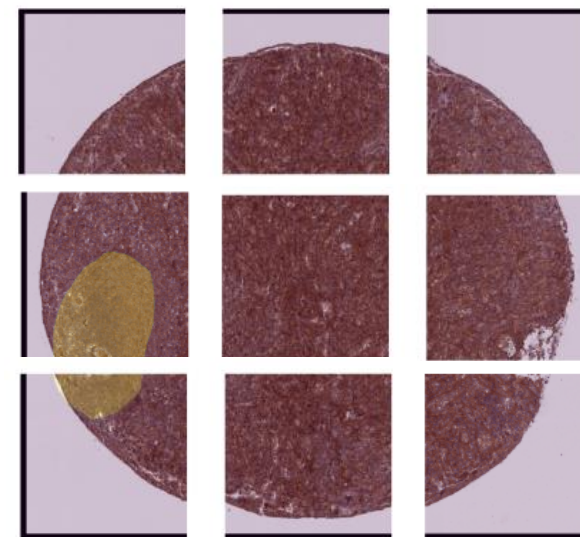


Size: 512x512

Reduce: 3

mean: [0.77793838 0.75350463 0.77059086]

std: [0.25238878 0.26609795 0.26175629]



Size: 512x512

Reduce: 2

mean: [0.77455656 0.74896831 0.76683053]

std: [0.25168728 0.2655022 0.26106301]

EFFICIENTNET WITH BEST AUGMENTATION STRATEGY

- Failed, lower than baseline strategy.

[\[Inference\]-HuBMAP fast.ai starter \(EfficientNet\)](#)

3rd_aug_b5 (version 2/5)

2 days ago by [KaggleJbt](#)

Succeeded

0.65

Notebook [\[Inference\]-HuBMAP fast.ai starter \(EfficientNet\)](#) |

3rd_aug_b5

- Fine-tuning with expansion strategy.

- Aims to keeping the model's 'attention' in the center of the picture.

[\[Inference\]-HuBMAP fast.ai starter \(EfficientNet\)](#)

original_expansion_32 (version 5/5)

an hour ago by [KaggleJbt](#)

Succeeded

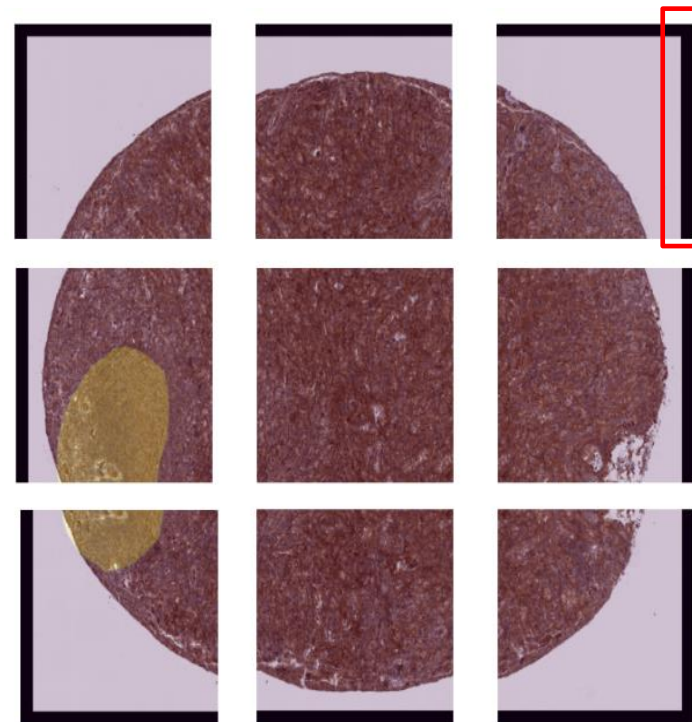
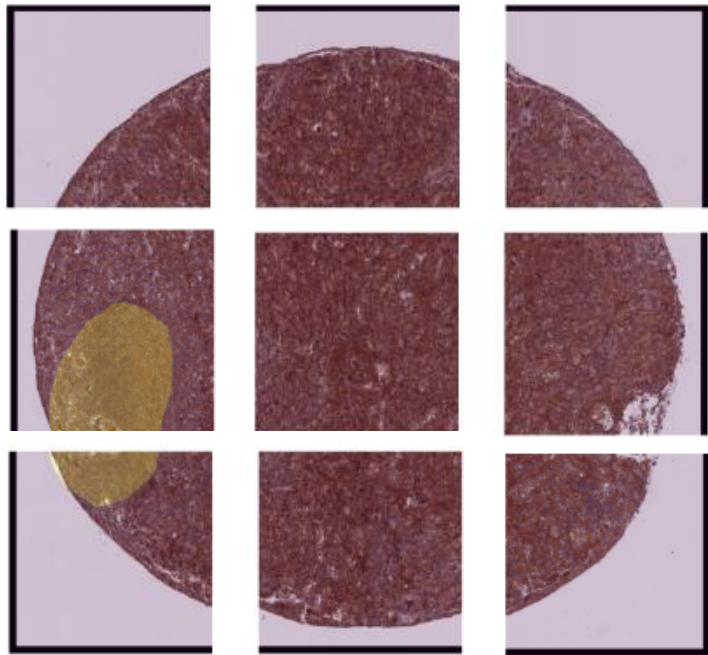
0.68

Notebook [\[Inference\]-HuBMAP fast.ai starter \(EfficientNet\)](#) |

original_expansion_32

EXPANSION STRATEGY

- Original VS Expansional



With 32 pixels expanded.

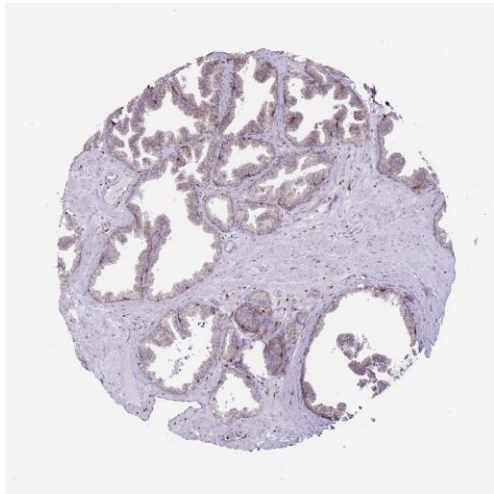
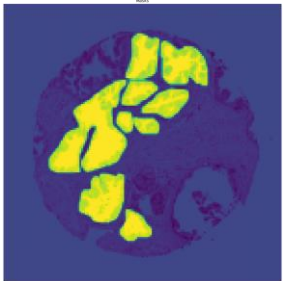
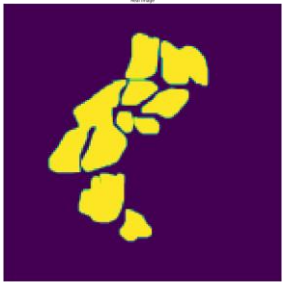
UNEXPECTED PROBLEM WITH 512X512 DATASET

- Accuracy of the model becoming 0.00.

8417.6s	16	Better model found at epoch 0 with dice_th value: 0.7505459785461426.
8784.1s	17	Better model found at epoch 1 with dice_th value: 0.7694703340530396.
9144.0s	18	Better model found at epoch 2 with dice_th value: 0.7873895764350891.
9509.6s	19	Better model found at epoch 3 with dice_th value: 0.8006038069725037.
9888.7s	20	Better model found at epoch 4 with dice_th value: 0.8156768679618835.
10250.9s	21	Better model found at epoch 5 with dice_th value: 0.8370798826217651.
10992.4s	22	Better model found at epoch 7 with dice_th value: 0.8484708666801453.
11708.0s	23	Better model found at epoch 9 with dice_th value: 0.8501719236373901.
12744.6s	24	Better model found at epoch 12 with dice_th value: 0.851460337638855.
13089.2s	25	Better model found at epoch 13 with dice_th value: 0.854593813419342.
13893.4s	26	Using cache found in /root/.cache/torch/hub/facebookresearch_semi-supervised-ImageNet1K-models_master
15015.4s	27	Better model found at epoch 0 with dice_th value: 0.0.

POSSIBLE REASON

- The training images become dark



- The threshold is wrong
 - We have changed anything relative to dataset size, only the threshold has not been changed...

CURRENT WORK...

Efficientnet b6 with 256*256

epoch	train_loss	valid_loss	dice_soft	dice_th	time
0	1.716399	1.480119	0.388310	0.511159	00:26
1	1.542975	4.981615	0.085019	0.190792	00:24
2	1.479532	1.364042	0.478051	0.610433	00:24
3	1.396010	1.284837	0.400563	0.633281	00:25
4	1.325525	1.209098	0.507726	0.658684	00:26
5	1.288258	1.168616	0.514543	0.675606	00:25

 6.25% [2/32 03:01<45:18]

epoch	train_loss	valid_loss	dice_soft	dice_th	time
0	1.239597	1.159782	0.517752	0.677740	01:30
1	1.240669	1.136273	0.541943	0.692066	01:30

 58.46% [38/65 00:52<00:37 1.2222]

Better model found at epoch 0 with dice_th value: 0.6777400970458984.

Better model found at epoch 1 with dice_th value: 0.692066490650177.

Efficientnet b7 with 256*256

epoch	train_loss	valid_loss	dice_soft	dice_th	time
0	1.663683	1.693518	0.346627	0.500540	00:20
1	1.544338	1.601726	0.233528	0.448817	00:22
2	1.468234	1.367311	0.395190	0.555847	00:21
3	1.398689	1.334017	0.444431	0.599694	00:20
4	1.363334	1.286321	0.406175	0.588292	00:21
5	1.323414	1.279848	0.432643	0.596507	00:20

 93.75% [30/32 55:50<03:43]

epoch	train_loss	valid_loss	dice_soft	dice_th	time
0	1.294138	1.268856	0.440116	0.604107	01:48
1	1.269168	1.244412	0.473480	0.618462	01:48
2	1.249755	1.204332	0.461191	0.639238	01:49
3	1.220818	1.174452	0.528411	0.662114	01:40



Thank you!