HuBMAP + HPA – Hacking the Human Body

Progress Meeting11 Group A

https://www.kaggle.com/competitions/hubmap-organ-segmentation

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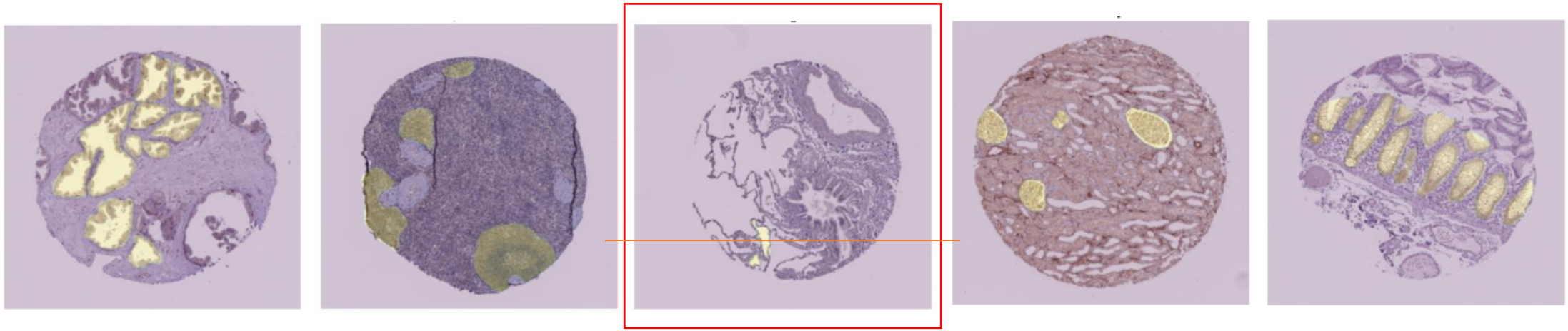
01 Full Size Image

Many features of labels would be destroyed after being cut.

Especially for lung images, the label of lung images is small compared to other organs, so if they are cut apart and the features are destroyed, the training effect will become very poor.



Prostate Spleen Lung Kidney Largeintestine

```
Better model found at epoch 0 with dice_th value: 0.11175310611724854.
Better model found at epoch 1 with dice_th value: 0.12226030230522156.
Better model found at epoch 3 with dice_th value: 0.14181286096572876.
Better model found at epoch 4 with dice_th value: 0.14627055823802948.
Better model found at epoch 6 with dice_th value: 0.1484823077917099.
Better model found at epoch 11 with dice_th value: 0.16871078312397003.
Better model found at epoch 12 with dice_th value: 0.16912923753261566.
```

To avoid this problem, we try not to cut the image, but train with the whole image to preserve the overall features of the label

1. Directly use 3000×3000 image

```
TRAIN = '../input/hubmap-organ-segmentation/train_images/'
LABELS = '../input/hubmap-organ-segmentation/train.csv'
```

2. Resize them to 768×768

```
img = cv2.resize(img, (768, 768))
mask = cv2.resize(mask, (768, 768))
```

3. Adjust batchsize to 8

01 Full Size Image

unext50 + full-image

Succeeded	0.56

Succeeded	0.62

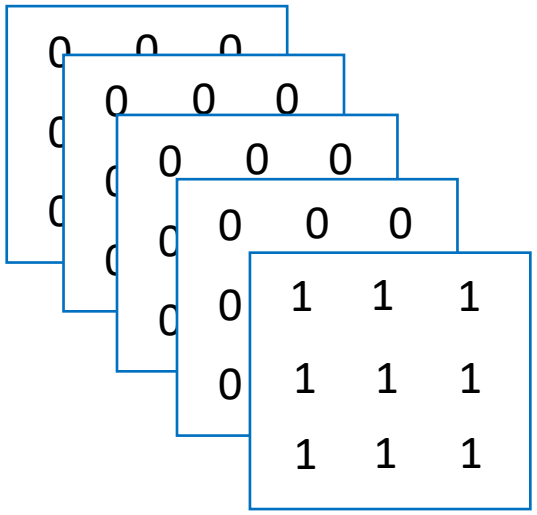
unext50 + full-image+augmentation

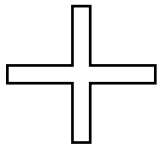
Succeeded	0.71

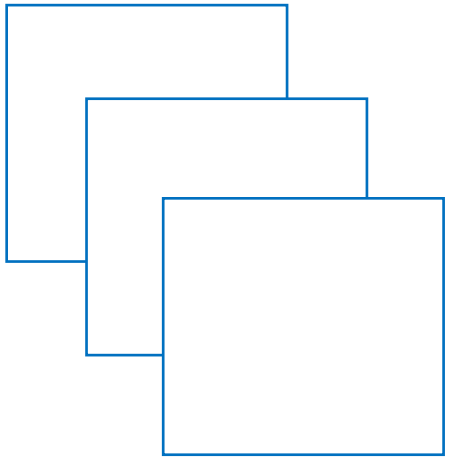
efficientnet + full-image+augmentation

Succeeded	0.74

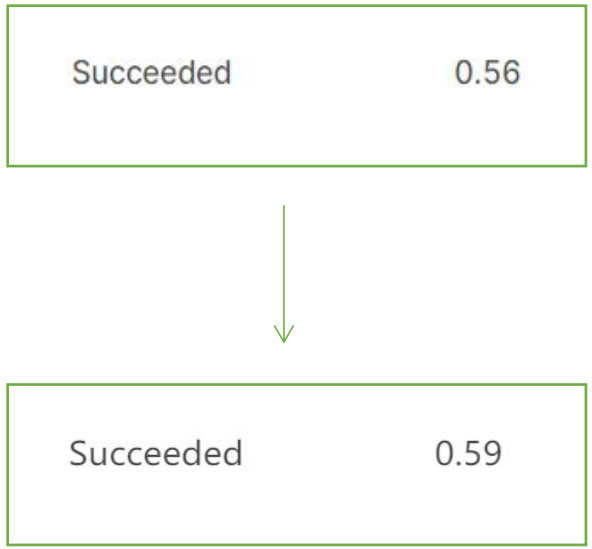
We use five additional channels to represent the information of five different organs.







RGB



Change the input data channel from 3 to 8

When multimodal is applied in the effincientnet：

unext50 + full-image+augmentation+multimodal

Possible reason:

1. We use the cut image for training, as the label is cut into small pieces, the difference between each organ becomes less obvious, then the multimodal may not play its maximum role.
2. Epoch number is not big enough.

Possible solution: Use the full images for training, the gap between different organs may be more obvious.

- Use full size images to multimodal in efficientnet to see if we can get a higher mark
- Adjust the epoch number
- Try our previous methods that failed in efficientnet (for example: stain norm) by using full image

Thanks for listening