Cell SEGMENTATION

Presented By **Innovators**

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Introduction & Problem Statement

Introduction

- Crucial task in biomedical image analysis
- Significant role in disease diagnosis, drug discovery, and cell biology research.

Problem Statement

- Enhancing the performance of U-Net on cell segmentation through novel activation functions

- The performance of U-Net is highly dependent on the characteristics of the training data, and the network may not generalize well to new datasets or cell types with different characteristics.

- Therefore, there is a need for research that explores methods to improve U-Net's performance in cell segmentation,

Existing body of work

Base Papers:

U-Net: Convolutional Networks for
Biomedical Image Segmentation

Medical Image Segmentation: 2018
Data Science Bowl
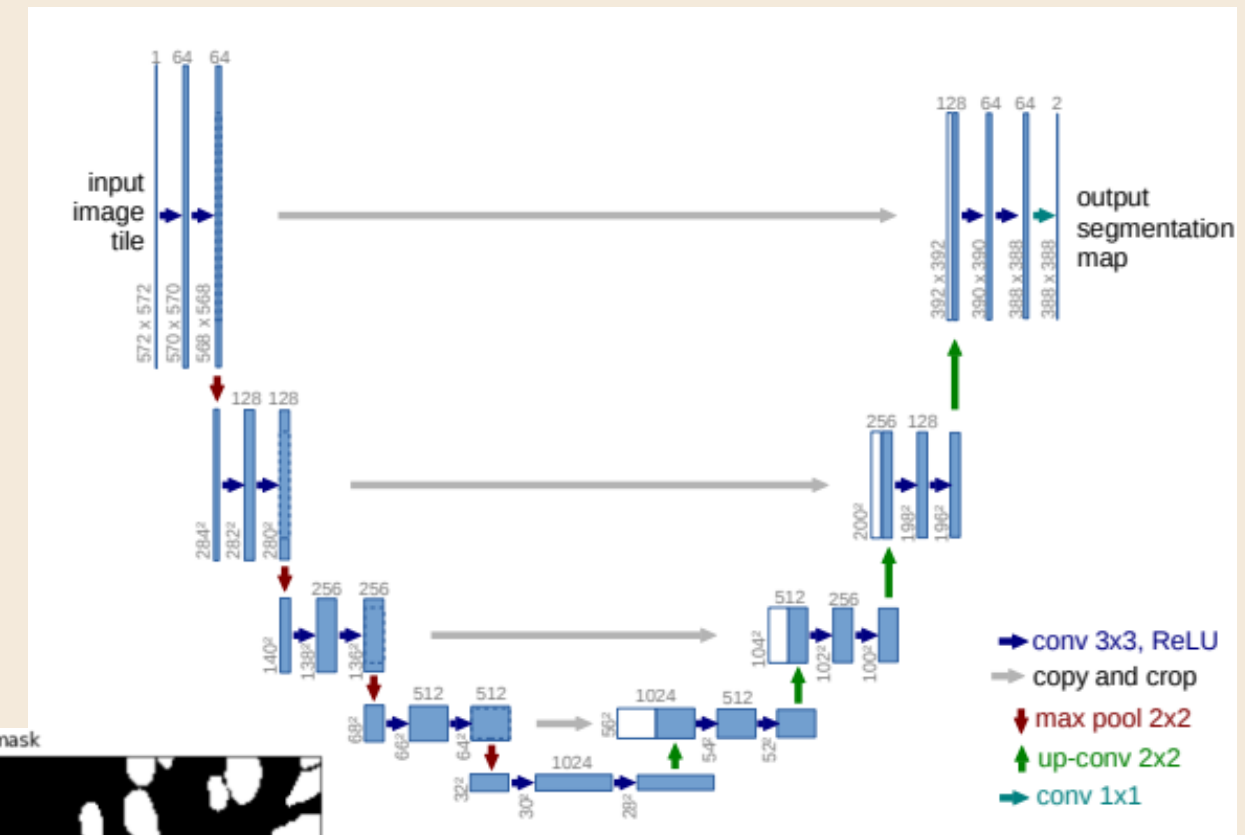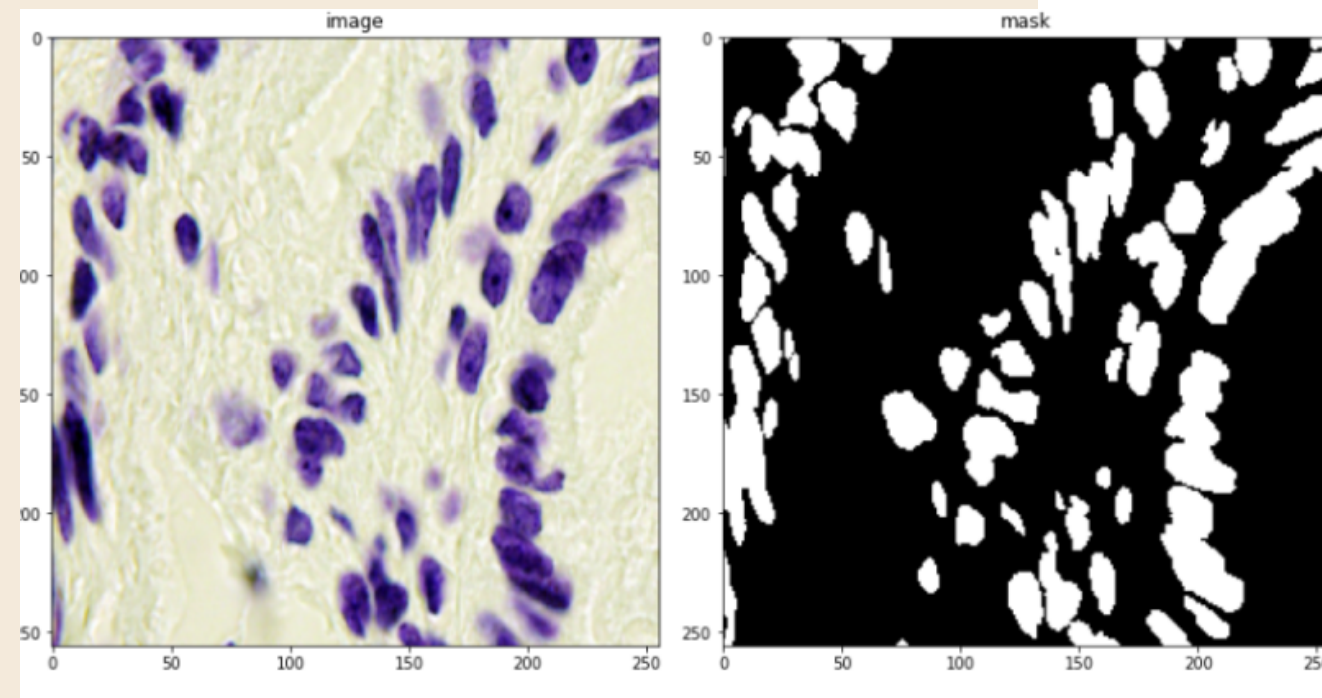
Your approach

We have trained our model using UNet architecture .Our further approach would be to try out more activation functions such as 2D Mexican ReLU, TanELU, MeLU+GaLU, Symmetric MeLU, Symmetric GaLU, and Flexible MeLU to improve it's accuracy

INITIAL RESULTS

We have trained our model using UNet architecture with 'ReLu' activation function on the dataset: 'data-science-bowl-2018' and nearly got accuracy of 92% accuracy(optimizer:adam,loss:dice_coef_loss,metric:iou)

```
Epoch 90/100
84/84 [==============================] - 1s 12ms/step - loss: -0.9554 - iou: 0.9150
Epoch 91/100
84/84 [==============================] - 1s 18ms/step - loss: -0.9507 - iou: 0.9062
Epoch 92/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9555 - iou: 0.9148
Epoch 93/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9565 - iou: 0.9167
Epoch 94/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9548 - iou: 0.9136
Epoch 95/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9549 - iou: 0.9139
Epoch 96/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9548 - iou: 0.9136
Epoch 97/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9550 - iou: 0.9140
Epoch 98/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9566 - iou: 0.9169
Epoch 99/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9569 - iou: 0.9174
Epoch 100/100
84/84 [==============================] - 1s 11ms/step - loss: -0.9569 - iou: 0.9175
```

ROLE OF EACH GROUP MEMBER IN THE PROJECT AND FUTURE WORK

Implementation of UNet, Further improvement on accuracy,Mid Sem Report,Weekly Rreports

Aadya Chinubhai
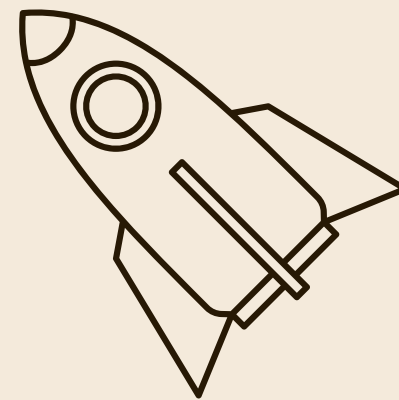
Nihar Jani

Mid Sem Presentation, Weekly Reports

Razin Karimi

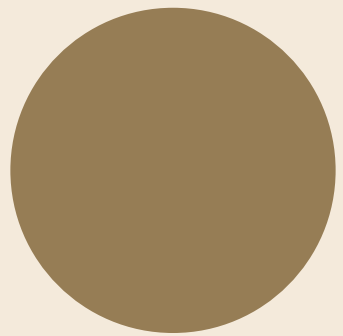Abhishu Oza

Implementationof UNet,Mid Sem Presentation,Weekly Reports

Implementationof UNet,MidSem Report,Weekly Reports

References

- https://arxiv.org/abs/2103.15898

- https://www.kaggle.com/c/data-science-bowl-2018

- https://arxiv.org/abs/1505.04597

- https://www.researchgate.net/publication/305193694_U-Net_Convolutional_Networks_for_Biomedical_Image_Segmentation

- https://towardsai.net/p/l/medical-image-segmentation-2018-data-science-bowl

Thank You

Have A Good Day