PathOs Weekly Meeting

AI/Algorithm part

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Encoder-Decoder with Atrous Separable Convolution for Semantic Image Segmentation
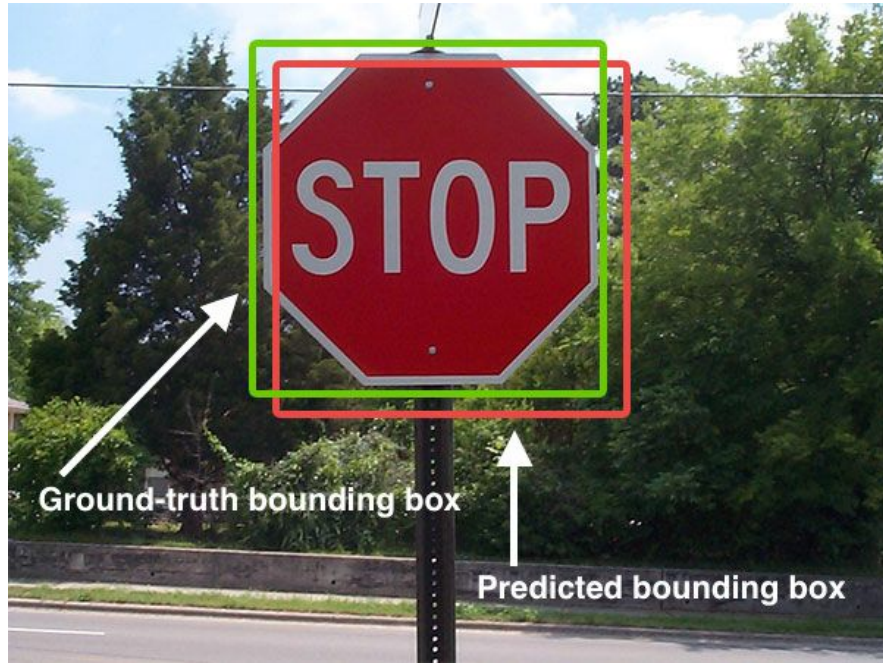
Liang-Chieh Chen, Yukun Zhu, George Papandreou, Florian Schroff, and Hartwig Adam

Google Inc.
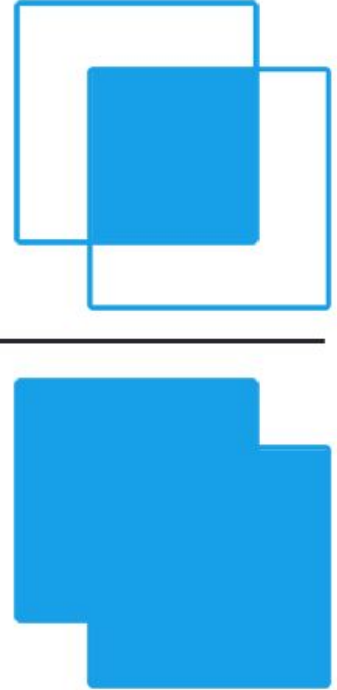{lcchen, yukun, gpapan, fschroff, hadam}@google.com

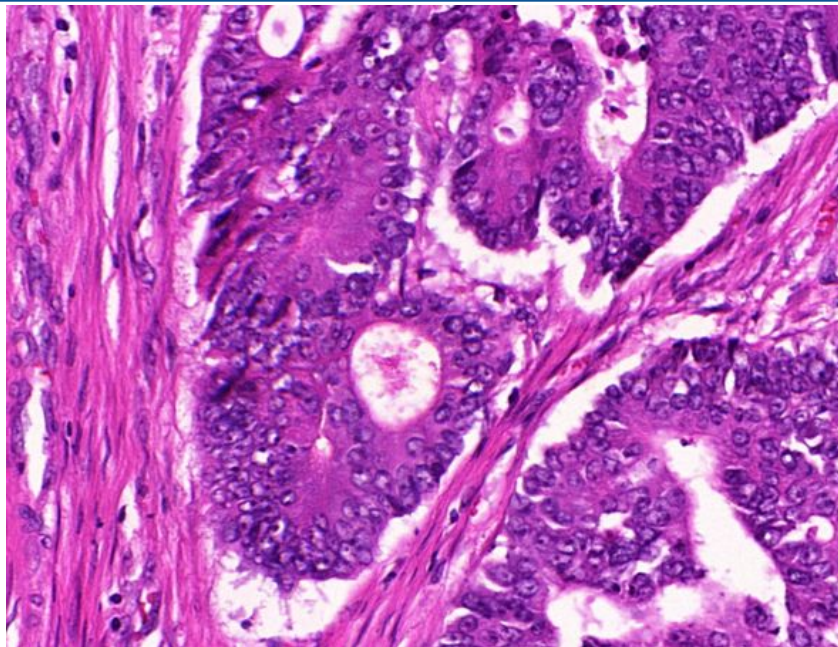https://github.com/VainF/DeepLabV3Plus-Pytorch

IoU Score

Ground-truth bounding box

Predicted bounding box

$$IoU = \frac{\text{Area of Overlap}}{\text{Area of Union}}$$

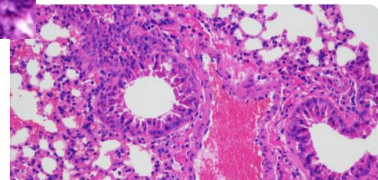Source: https://en.wikipedia.org/wiki/Jaccard_index

Model Scale Comparison

GlaS@MICCAI'2015: Gland Segmentation
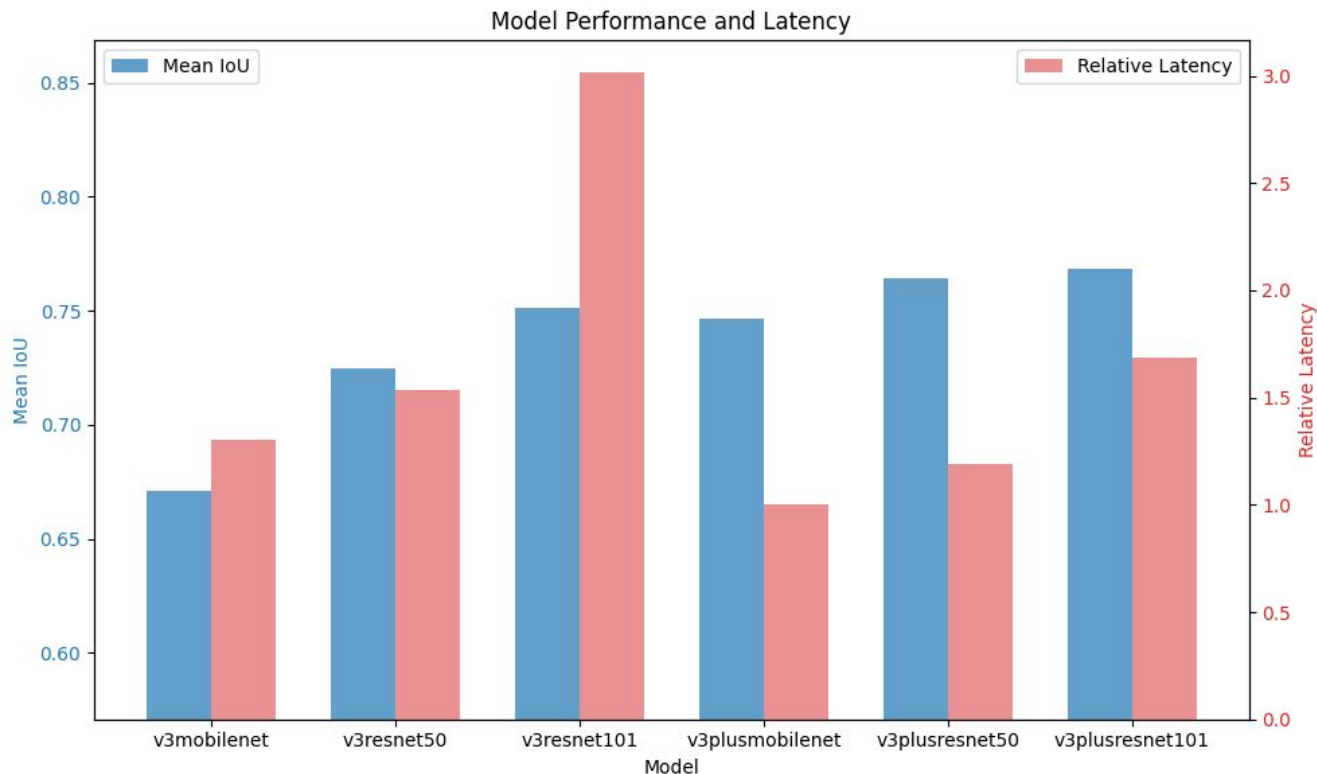
Gland Segmentation in Colon Histology Images Challenge
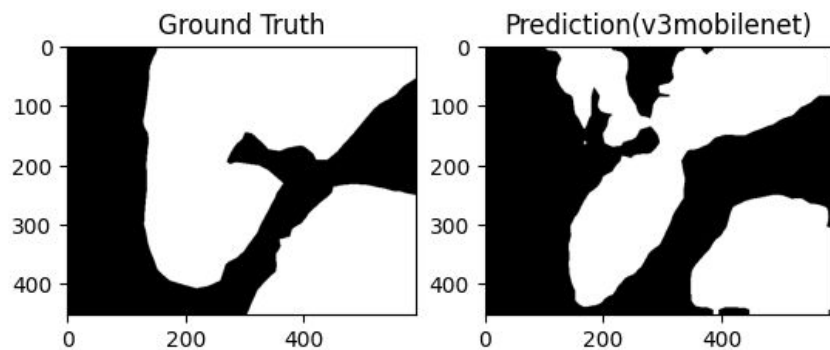
Model Scale Comparison

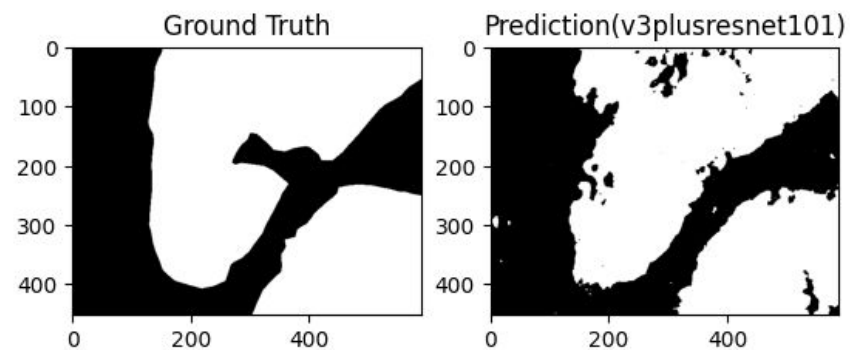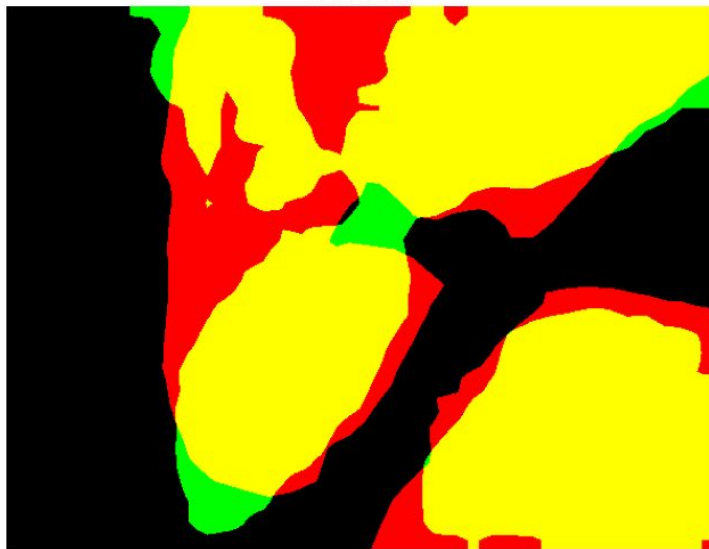TrainSet: *Warwick QU gland data*

Split: train : test = 8 : 2

Environment: Macbook M2 mps

Epochs: *15*

Model Performance and Latency

Ground Truth · Prediction(v3mobilenet) · Ground Truth · Prediction(v3plusresnet101)
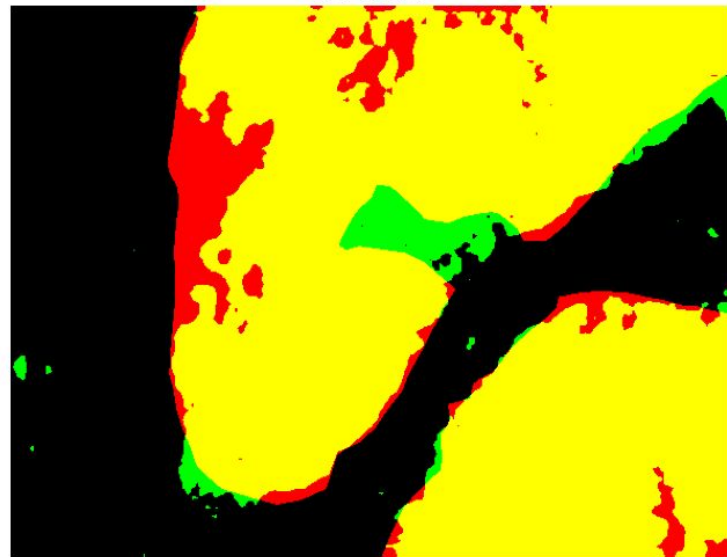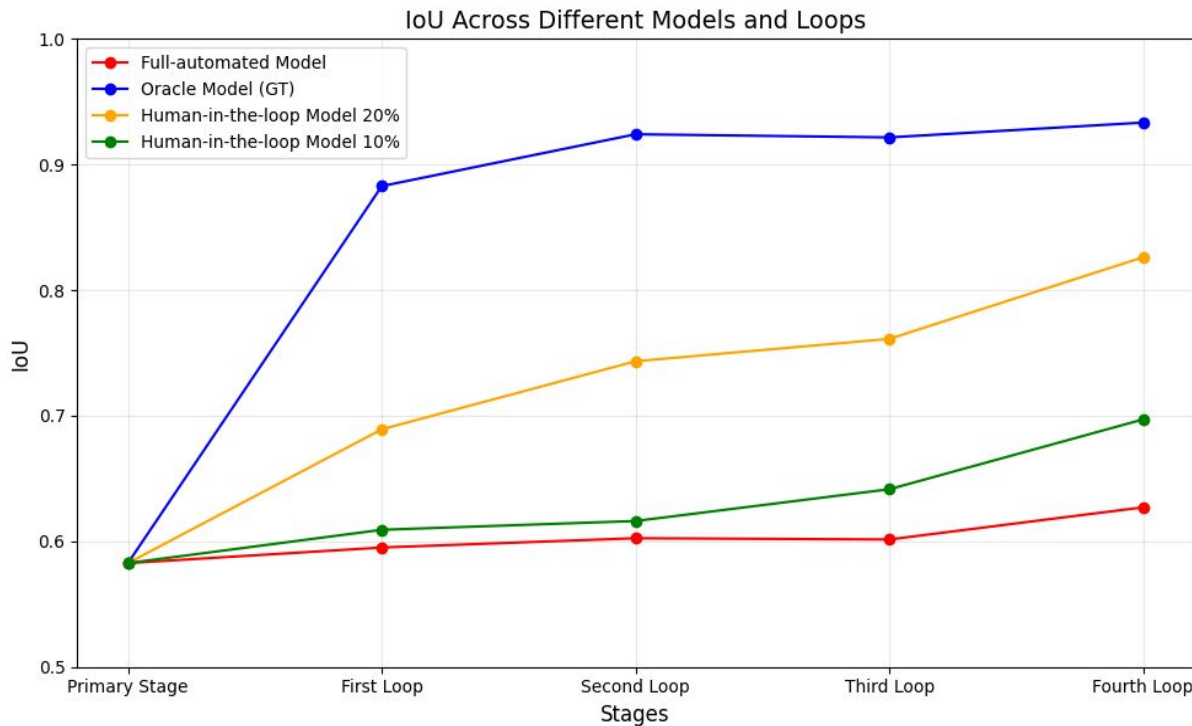
Overlap Visualization
(Red: Ground Truth, Green: Prediction, Yellow: Overlap)
IoU: 0.7297

Overlap Visualization
(Red: Ground Truth, Green: Prediction, Yellow: Overlap)
IoU: 0.8477

The Property of Human-in-the-loop Model

TrainSet: *Warwick QU gland data*

Split: train : test = 8 : 2

Environment: Colab/A100 GPU

Epochs: *20*

IoU Across Different Models and Loops

Full-automated model
0.5823
0.6525
0.6861
0.6742
0.6815

Oracle model (GT)
0.5823
0.8853
0.9174
0.9236
0.9487

Human-in-the-loop model
0.5823
0.6863
0.7472
0.7691
0.8401

Human-in-the-loop model 10%
0.5827
0.6092
0.6162
0.6415
0.6971