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Impact of different Data Augmentation Techniques for Deep Learning with Optical Coherence Tomography

Oberseminar Presentation

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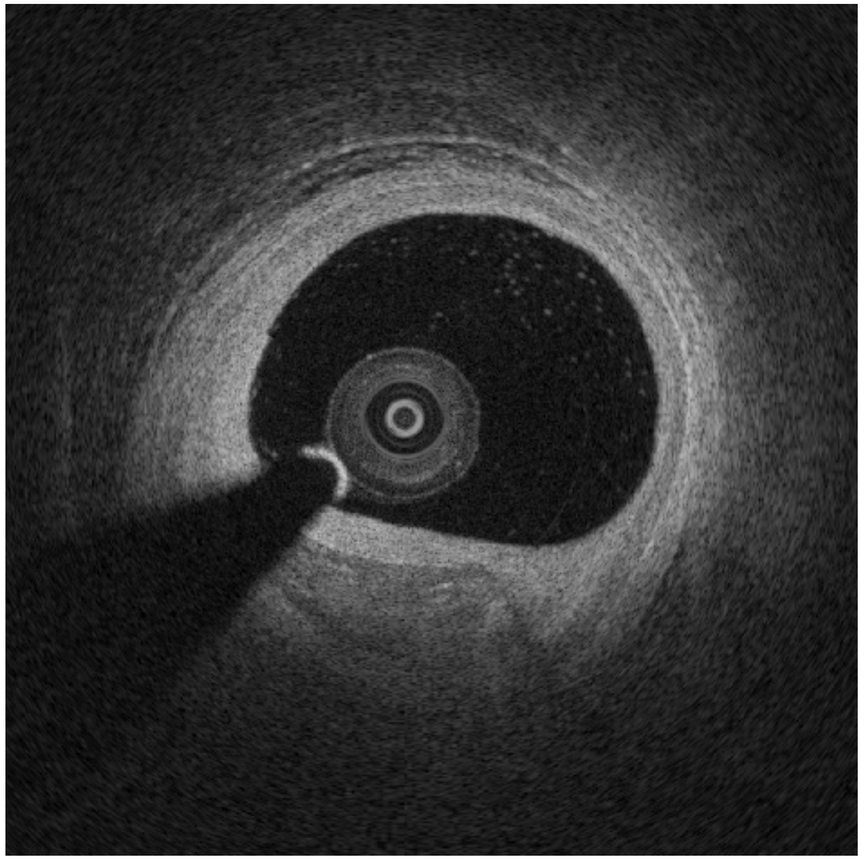
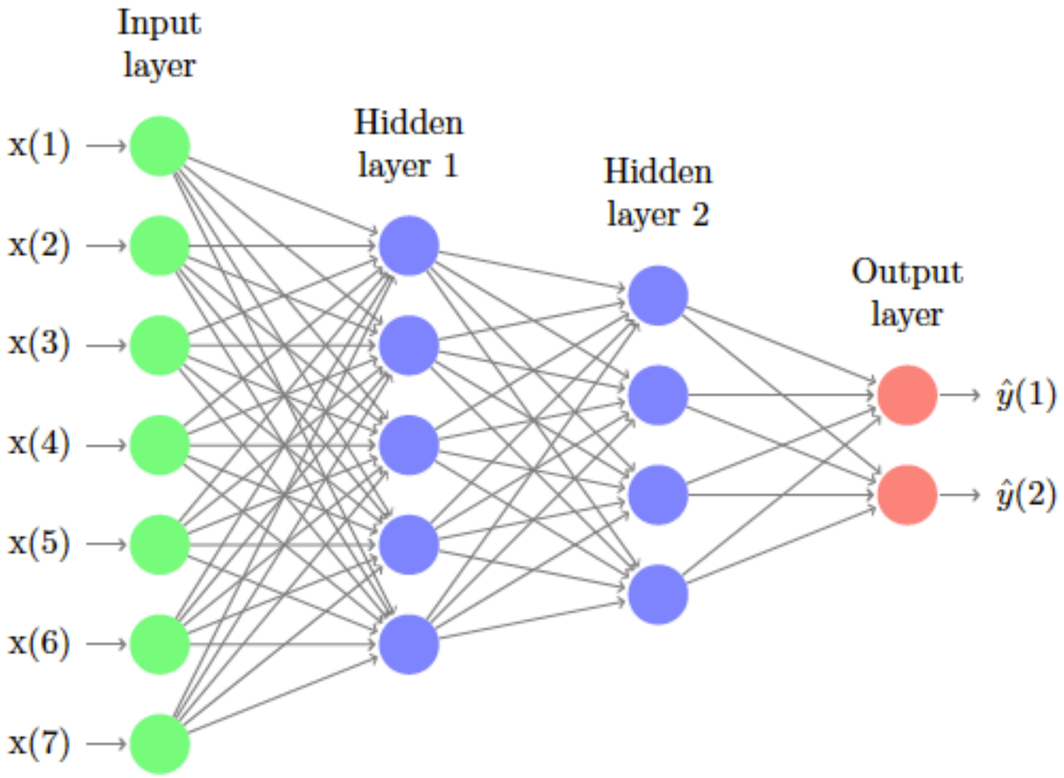
IVOCT Images

- Intravascular Optical Coherence Tomography
- Rotated catheter
- Image composed of capturing light reflections
- For morphology and planing treatment



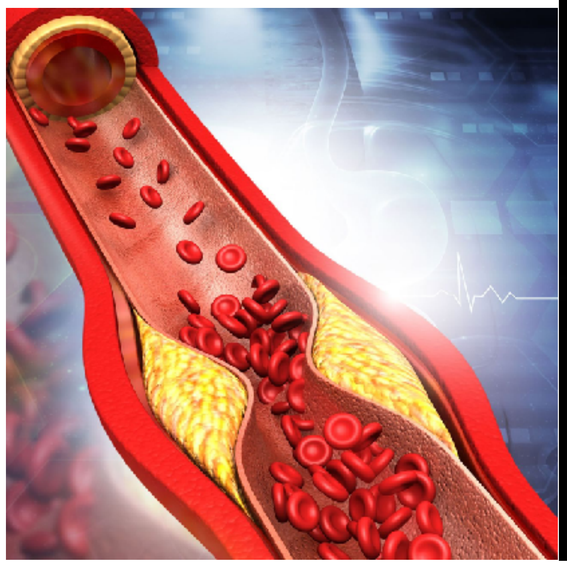
Deep Learning

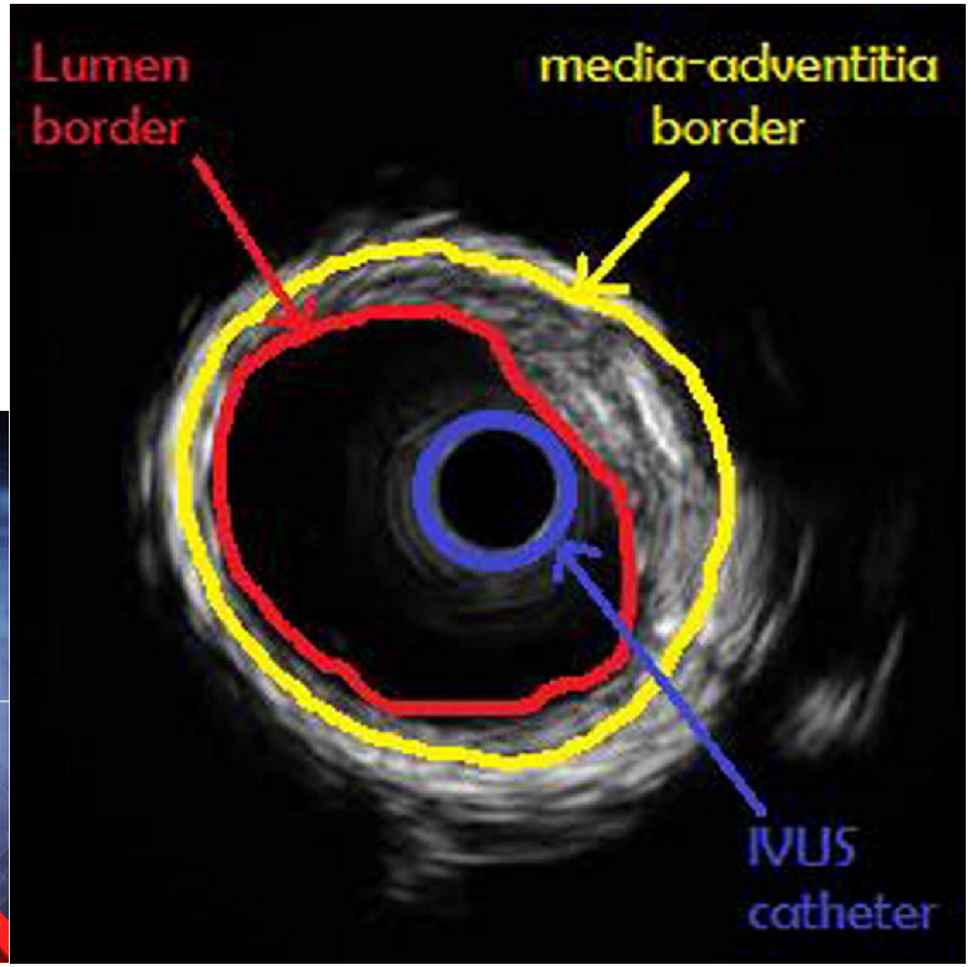
- Neural network
- Determines Predictions
- Analogy to biological brains
- Learning Process with Data and Weights



Deep Learning in IVOCT

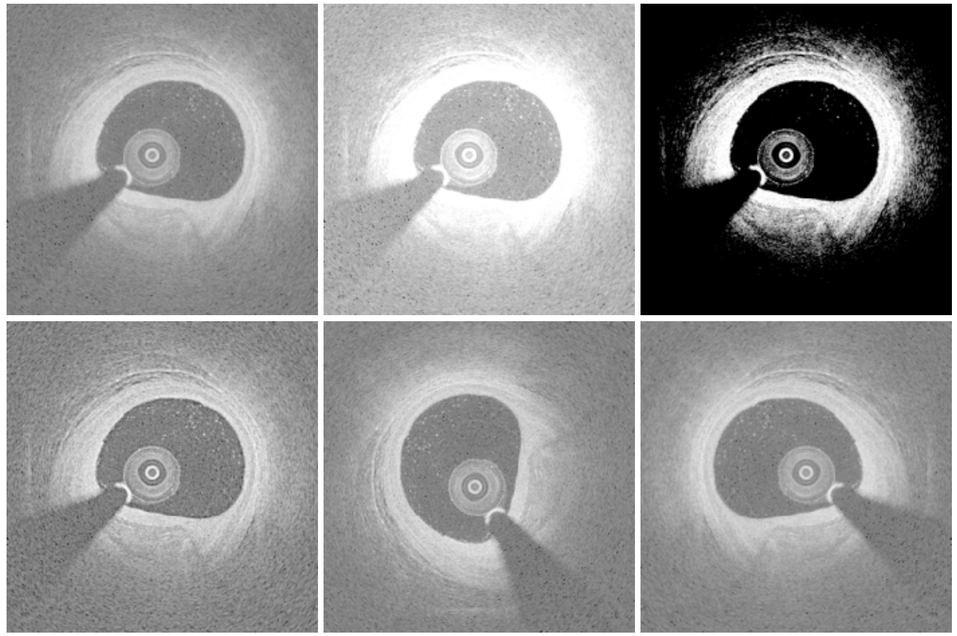
- Plague or no Plague?
- Automatic Prediction





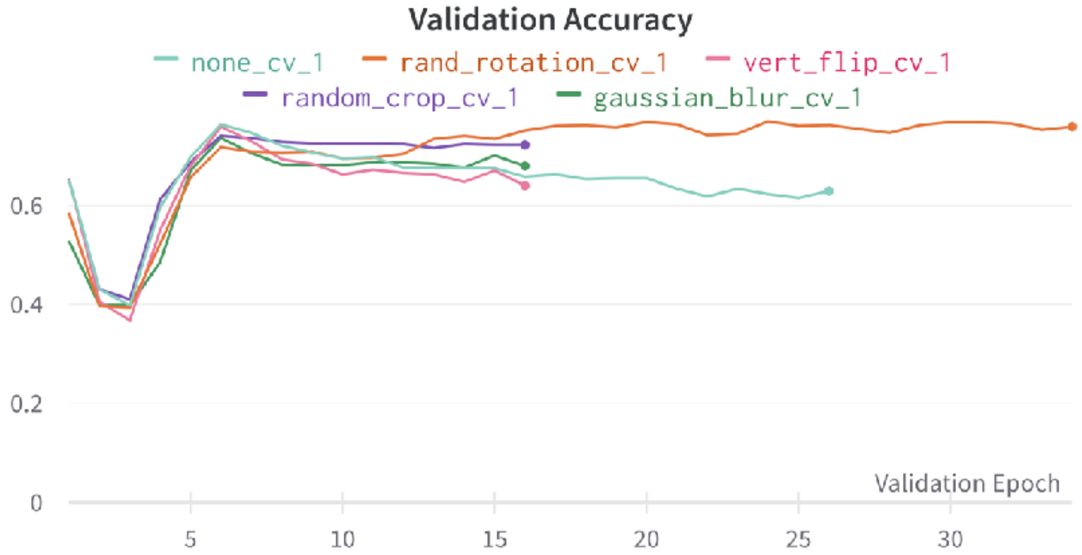
Data Augmentation and its Purpose

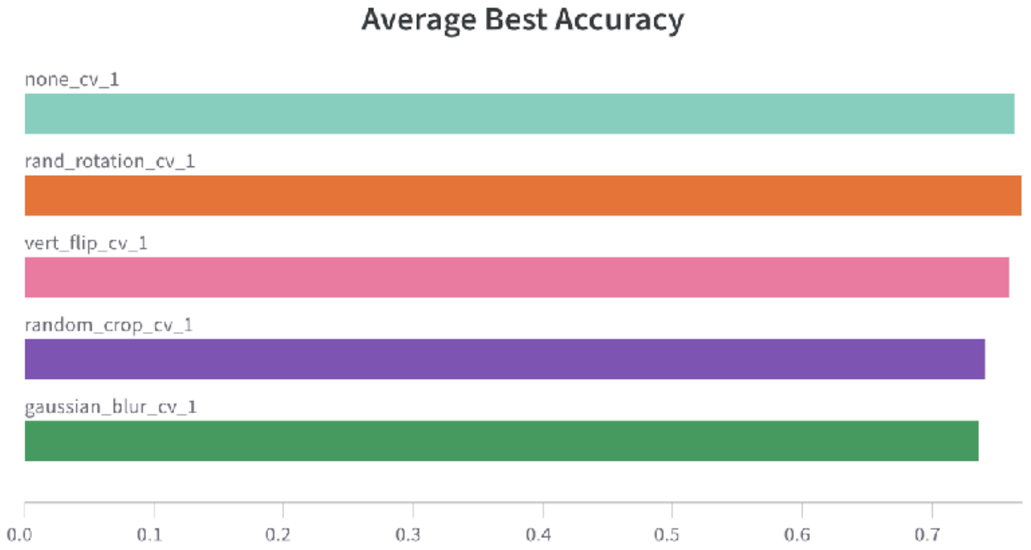
- increase the amount of data
- adding modified copies
- reduce overfitting
- increase performance and resilience



Topic of Bachelor Thesis

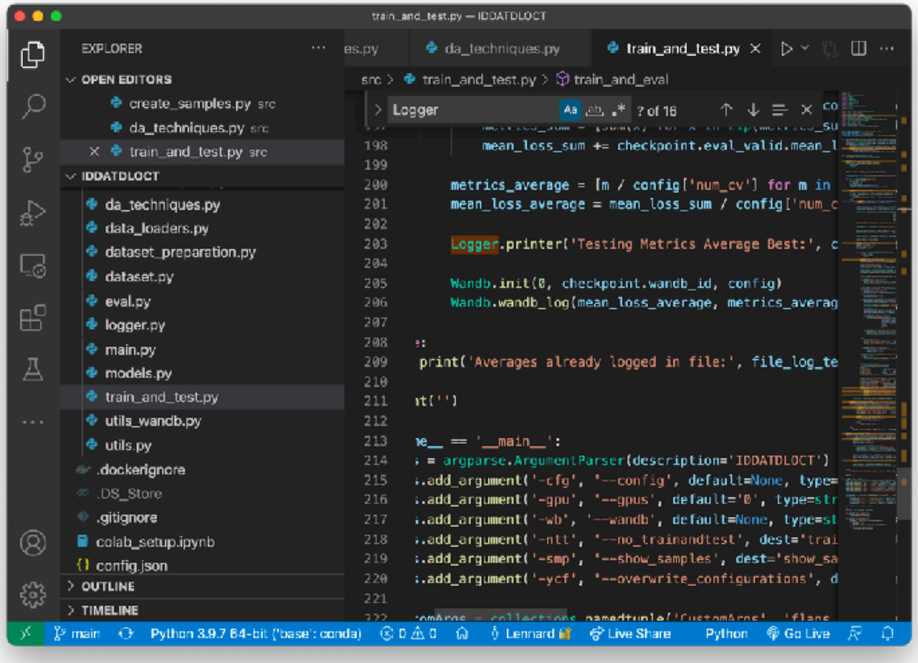
- Impact of different data augmentation techniques
- Metrics as Measurement
- Proposal





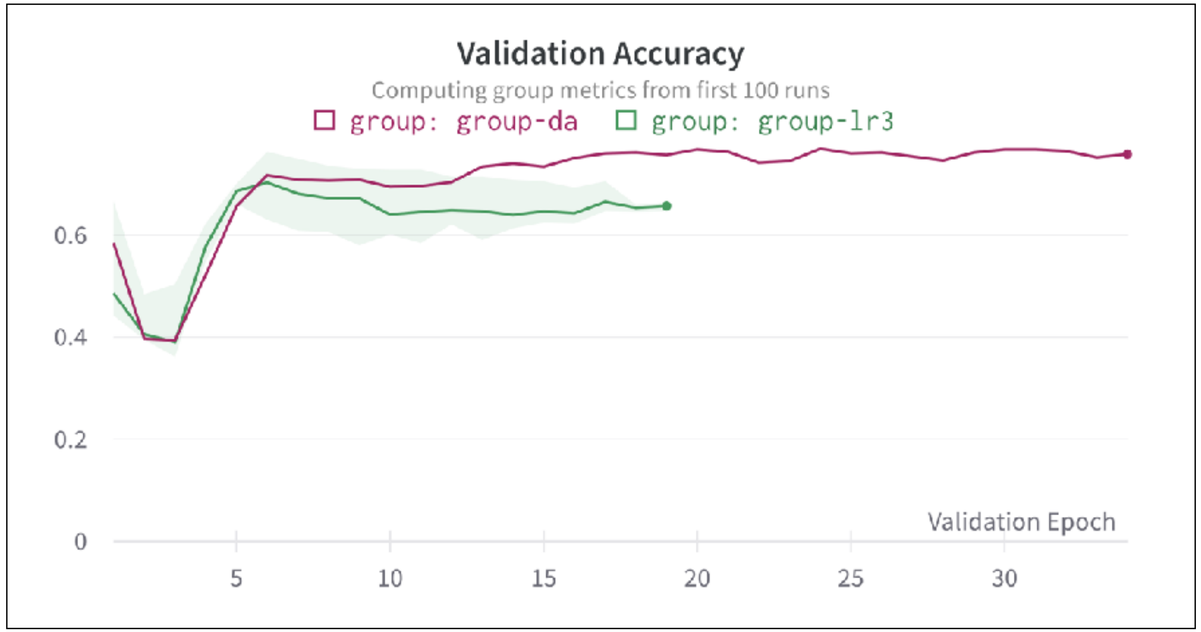
Preliminary Results

Implement pipeline for training



Testing for best learning rates, batch size, etc.

Testing performance for first DA techniques



Further Steps

Implement more DA Techniques, e.g.: Elastic transforms, imitation of artefacts

Metric statistics and analysis for effect of: techniques, their combination

Compare results of IVOCT images to those of other datasets

Implement Own DA Techniques

Try GAN's?

References

- https://en.wikipedia.org/wiki/Intracoronary_optical_coherence_tomography
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- https://towardsdatascience.com/its-deep-learning-times-a-new-frontier-of-data-a1e9ef9fe9a8
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