Medical Imaging and Biometrics Group
Institute of Computer Graphics and Vision
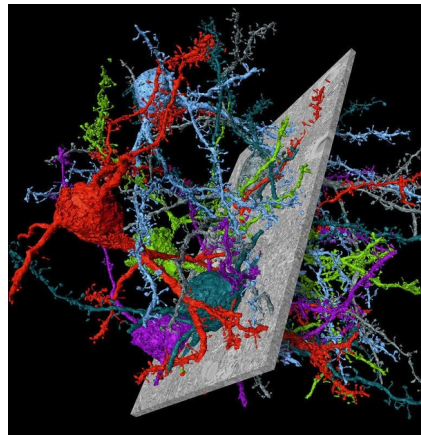*Graz University of Technology*

Instance Segmentation in Medical Image Applications

Master's Thesis/Project

Description:

To start answering fundamental questions for understanding how the brain works, we need to look at the brain structure on the cell levels. Reconstruction of cell morphology and building connectivity diagram requires that all instances of neuron cell are segmented. Differently, to semantic segmentation, instance segmentation does not only assign a class label to each pixel of an image but also distinguishes between instances within each class, e.g., each individual cell in an electronic microscopy image gets assigned a unique ID. This work will investigate interesting direction for simultaneous segmentation of all instances by automatically encoding the individual instances as pixel-wise embeddings.

Objective:

- Perform literature review on instance segmentation and embedding loss.
- Train and test the networks for instances segmentation tasks.
- Evaluate different embedding losses.

Qualification:

- Experience in Python or C++
- Knowledgeable with TensorFlow
- Interested in machine learning and computer vision

Literature:

Payer et al., Instance Segmentation and Tracking with Cosine Embeddings and Recurrent Hourglass Networks*, MICCAI, 2018

Contact ICG:

Darko Štern
stern@icg.tugraz.at

Webpage:

https://www.tugraz.at/institute/icg/research/team-bischof
/medical-imaging-biometrics/