

Bachelor / Master Thesis

Salient Object Segmentation / Ophthalmic Image Analysis

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Background

With the rapid development of deep learning techniques, the applications of computer vision tasks in ophthalmology, which is one of the examples in the biomedical fields, are overwhelmed by the deep learning based methods. Two aspects are taken as the foci of the my research and are considered as the potential thesis topics: salient object segmentation and ophthalmic image analysis.

Salient object segmentation is, in the project of InnoRetVision (<http://www.rtq2610.org>), served as the processing interface between the natural scenes and the retinal implant. Datasets of natural scenes like Cityscapes and Pascal-S are the desired scenarios of this topic.

Ophthalmic image analysis consists of multiple subtasks based on the images of fundus photography and optical coherence tomography (OCT), namely fovea localization, optic disc / cup segmentation, vessel segmentation, and glaucoma grading.

Tasks

- Literature review
- Develop and refine the corresponding methods based on the existing ones
- Implement and evaluate, including ablation study
- Optionally validate on different datasets

Your Profile

- Student of RWTH Aachen with Faculty 6
- Programming experience (preferably Python)
- Knowledge in computer vision / digital image processing
- Prior experience with deep learning framework is a plus

Our Offer

Our institute features an ultra-modern computer infrastructure, including a remotely accessible cluster for training the deep learning networks with dozens of GPUs. Throughout the thesis period, you will be actively supported via your fixe meetings. You can choose either salient object segmentation or ophthalmic image analysis as your thesis topic based on your preference. The scope of the work will be adapted according to the requirement of Bachelor / Master.

If you are interested, a short email to yuli.wu@lfb.rwth-aachen.de with the latest résumé and the transcript of grades (Notenspiegel) would be expected.