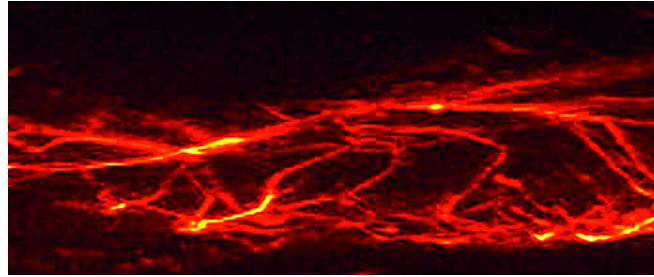


Exploring Regularizers for Photoacoustic Image Reconstruction

Paid Master's Thesis



Based on the photoacoustic effect and ultrasonic wave propagation, Photoacoustic Imaging (PAI) is an image modality to make the optical absorption properties of biological tissue visible. Therefore, PAI is very attractive for biomedical research since the distribution of blood vessels and the oxygen saturation of blood can be determined without contrast agents.

Objective:

The aim of this thesis is to explore image reconstruction algorithms for PAI. You will setup an image reconstruction framework for PAI. In this framework, you will explore different kinds of regularization such as Total Variation, Total Generalized Variation or Shearlets and other regularizers that are suited for vessel-like structures. An evaluation of all approaches will be performed on phantom and in-vivo data.

This project will be conducted in cooperation with the Institute of Physics, University of Graz.

Qualifications:

- Student of Biomedical Engineering, Information and Computer Engineering, Computer Science or Software Engineering and Management
- Basic knowledge in computer vision and optimization
- Programming experience in Matlab and/or C++. Optional: Cuda
- Interest to work in an interdisciplinary team

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