

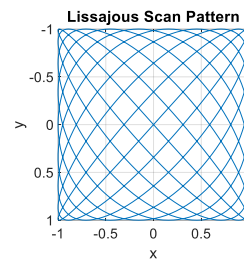
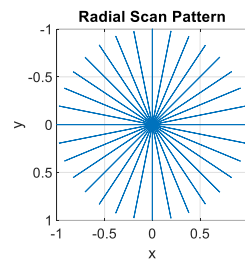
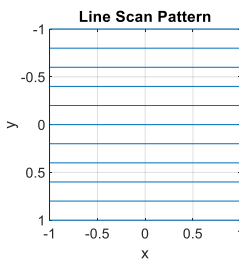


**Earliest start:
01.09.2024**

Bachelor's Thesis / Master's Thesis

Volume reconstruction from confocal microscopy image data of the moving eye

In vivo confocal microscopy enables the imaging, visualization and morphological characterization of the cellular structures of the cornea and thus has enormous potential for the diagnosis of diseases of the ocular surface. However, eye movements (e.g. microsaccades) during the recording process lead to motion artifacts in the image data, which must be precisely corrected before further processing and evaluation. Due to the longer acquisition time, this applies to volume images to a greater extent than to 2D images. Movements perpendicular to the primary image plane pose a particular challenge. The task of this thesis is to simulate and evaluate various scanning patterns for confocal microscopy volume imaging of the eye, and to develop an approach to motion correction and volume reconstruction from the image data.



Tasks:

- Literature review on the state of research
- Simulation of the confocal imaging process of a moving scene
- Development and implementation of an approach for the correction of the motion artifacts and volume reconstruction from the simulated image data
- Evaluation of the results

Education, Experience, and Skills:

- Motivation to familiarize yourself independently with a practical subject area
- Programming skills required (preferably in C++, Python or Matlab)
- Knowledge in the field of image registration methods desirable

Die Abschlussarbeit kann auch in deutscher Sprache verfasst werden.

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