



FRIEDRICH-ALEXANDER
UNIVERSITÄT
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FACULTY OF ENGINEERING

Pattern Recognition Lab (Dept. 5) • Martenstr. 3 • D-91058 Erlangen

Students from:

Computer Science,
Medical Engineering,
and related subjects

Computer Science Department 5

Pattern Recognition Lab

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Bachelor Thesis / Research Project / Internship

Cone-Beam CT X-Ray Image Simulation for the Generation of Training Data

Our research group uses Deep Learning methods to reduce the severity of Metal Artefacts in Cone-Beam CT images. This thesis aims to design and validate a simulation pipeline, which creates realistic X-Ray projection images from available CT volumes and metal object meshes. Additionally, 2D and 3D ground truth binary masks should provide a segmentation of metal to be used as ground truth during training. The explicit focus of the data generation will be placed on the accuracy of the Metal Artefacts.

Timeframe

- Flexible, starting from April 2022

Your qualifications

- Fluent in Python and/or C++
- Knowledge of Homogenous Coordinates and Projective Mapping
- Interest in Quality Software Development / Project Organisation
- Experience with CUDA and interface to C++ / Python (optional, big plus)

You will learn

- to organize a short-term project (report status and structured sub-goals)
- to scientifically evaluate the developed methods
- to report scientific findings in a thesis / a publication

The thesis is funded by Siemens Healthineers and can be combined with a working student position prior to or after the thesis (up to 12 h/week). If interested, please write a short motivational email highlighting your qualifications and describe one related code project you are proud of. Please also attach your CV and transcript of records from your current and previous studies.

