



JOHANNES KEPLER  
UNIVERSITÄT LINZ

Netzwerk für Forschung, Lehre und Praxis



Institut für Wissensbasierte  
Mathematische Systeme  
Fuzzy Logic Laboratorium

Univ.Prof. Dr. Erich Peter Klement

Tel.: +43/70/2468-9151

Fax: +43/70/2468-1351

ep.klement@jku.at

Sekretariat:

Sabine Lumpi / DW 9194

sabine.lumpi@jku.at

## Diploma Thesis

### ‘Image Processing for Microstructure Data Analysis’

The ‘Department of Knowledge-based Mathematical Systems’ at the Johannes Kepler University Linz is offering a **diploma thesis in the field of image processing for microbiological applications and for sub-cellular and microstructure data analysis.**

Biological and technical structures in (sub)-micrometer range can be imaged by different microscopy techniques (e.g. transmission, phase, interferometric or fluorescence microscopy). However, real images in field of microbiology and microstructure scanning are often hampered by a low signal-to-noise ratio. Image processing techniques should be applied to enhance image quality, to segment objects and extract relevant structures. The extracted data should be prepared to allow further machine learning methods with respect to classification. Especially an automatic evaluation of cell scans should be within the scope of this work.

**In this thesis, image enhancement and segmentation methods for structures in (sub)-micrometer range scanned by different microscopy techniques should be investigated, described and compared to each other.**

#### Profile/Personal Qualification of the candidate:

Ideally, the candidate should have a completed bachelor in Mathematics/ /Mechatronics/Physics or any other technical study and be interested in image processing, data analysis technique and programming. Some additional interest in field of imaging techniques and signal analysis are welcome.

#### Contact:

Univ.Prof. Dr. Erich Peter Klement,

email: [ep.klement@jku.at](mailto:ep.klement@jku.at)

Dipl. Phys. Bettina Heise,

email: [bettina.heise@jku.at](mailto:bettina.heise@jku.at)