



Institut für Geographie
Professur für Fernerkundung & GIS

Prof. Dr. Matthias Braun
matthias.h.braun@fau.de
www.geographie.uni-erlangen.de

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Seminar Master PG Consolidation module emphasis Geoinformatics

Microwave remote sensing

Prof. Dr. Matthias Braun

Study programs: MSc Climate & Environmental Sciences

ECTS: 5 (2 SWS)

Number of participants: 20

Language: English

Content: Optical imagery bears the disadvantage of cloud cover and variable illumination conditions. In contrast, active microwave sensors provide a data source strongly independent of such effects and that enables complementary information retrieval, e.g. deformation monitoring. In the class you will learn the basics and theory as well as practical processing of synthetic aperture radar imagery, its application for different examples from land use land cover, urban areas, snow & ice. You will see how digital elevation models can be derived by SAR interferometry and how the principles of deformation monitoring work. Aim of the class:

- Gain a basic understanding of the sensor technology and analysis steps
- Gain knowledge of different application fields
- Get an idea of potential, limits, difficulties to utilize the technique
- Knowledge and understanding of basic processing steps for SAR data like calibration, automatic co-registration, multi-looking, geocoding and orthorectification, coherence computations, interferometry
- Develop simple shell scripts for automatic processing

Entry requirements: Basic GIS knowledge (e.g. generating maps, generating and modifying data, spatial analysis, generating maps), basics of image analysis (e.g. unsupervised and supervised classification, thresholding, filtering), basic scripting (e.g. R, Python) and statistics

Assessment: Own small project at the end of the class (includes respective data processing and write-up in paper style), 2-3 homework assignments

Start of class / first meeting: 23.4.; 30.4., 7.5., 14.5., 28.5., 18.6., 25.6., afterwards project work by students