Call for MSc Thesis

APPLIED GEOLOGY
UNIVERSITY OF HALLE-WITTENBERG

land cover classification using high resolution aerial photography

About

Land cover (LC) classification in urban areas is an extensively studied field in the last centuries and finds broad application in urban mapping. This thesis aims to utilize these well-known concepts to generate land cover maps from publicly available high resolution orthophotos (10 cm ground resolution) for Cologne, North Rhine-Westphalia. The resolved land cover maps can be used as input for numerical groundwater models and to assess local anthropogenic stress on subsurface environments.
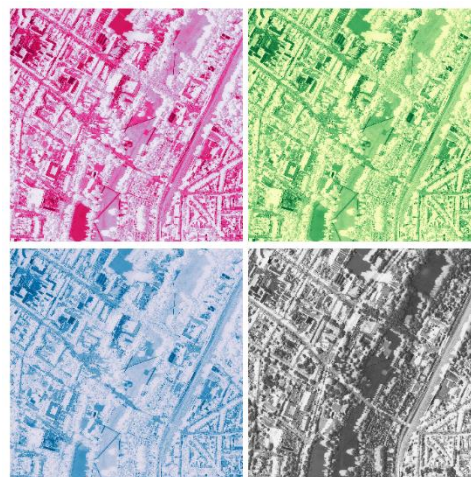
Tasks

- short literature review of pixel- and object-based classification
- create a rich training data set
- train multiple pixel-based classification system
- develop a concept of an object-based classification system
- perform and accuracy assessment of the LC classification

Requirements

- experience in programming languages (preferably Python) and GIS software
- entry level knowledge of remote sensing concepts and machine learning classifiers
- data management and handling skills
- enthusiasm for development of computational methods

Publication(s) to get started

- Hester, D. B., Cakir, H. I., Nelson, S. A., & Khorram, S. (2008). Per-pixel classification of high spatial resolution satellite imagery for urban land-cover mapping. *Photogrammetric Engineering & Remote Sensing*, *74*(4), 463-471.
- Myint, S. W., Gober, P., Brazel, A., Grossman-Clarke, S., & Weng, Q. (2011). Per-pixel vs. object-based classification of urban land cover extraction using high spatial resolution imagery. *Remote sensing of environment*, *115*(5), 1145-1161.
- Yan, W. Y., Shaker, A., & El-Ashmawy, N. (2015). Urban land cover classification using airborne LiDAR data: A review. *Remote Sensing of Environment*, *158*, 295-310.

Supervisors

Hannes Hemmerle (hannes.hemmerle@geo.uni-halle.de)
Prof. Peter Bayer (peter.bayer@geo.uni-halle.de)