RSL MSc-thesis opportunities

GEO442
Andy Hueni
Sampling methods and target heterogeneity impacts on repeatability and uncertainty of ground based spectral reference data.
Aims

- Establish the uncertainty of spectral ground reference points (SGCPs) due to sampling method
- Explore the link between repeatability, sampling method, foreoptic and uncertainty
- Develop a model that can be used to predict the uncertainty of SGCPs in a spectral database framework
- Develop recommendations regarding the use of foreoptics for the ASD spectrometers

Motivation and Links to International Efforts

- Airborne and spacebased imaging sensor data need to be calibrated and validated using SGCPs
- Practical application of this research:
  - European Space Agency: CAL/VAL activities of Sentinel-2, Sentinel-3, FLEX
  - Geoscience Australia: Digital Earth Australia (DEA) project
Methodology

- Practical field work on plots of various homogeneity to spectrally and spatially characterise them
- Measurements using field spectro-radiometers and imaging drones
- Statistical data analysis
- Spatio-spectral modelling of plots (building digital models of the plots)
- Simulation of sampling approaches both in the real world and in the modelled plots
Requirements & Benefits

- Matlab programming
- Use of SPECCHIO spectral database to store data and carry out Matlab based analysis
- Learn how design field experiments
- Learn about uncertainty analysis
- Learn about sensitivity analysis
- Learn about the common errors in field spectroscopy
- Learn how to use field equipment
- Be creative!
Contact

Andy Hueni
ahueni@geo.uzh.ch