Module title			Abbreviation
Advanced Programming for Remote Sensing and GIS			04-GEO-MET4-212-m01

Module coordinator	Module offered by
holder of the Professorship of Remote Sensing	Institute of Geography and Geology

ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--

Duration	Module level	Other prerequisites
1 semester	graduate	--

Contents

This course aims to deepen the participants‘ knowledge base and technical skills in the field of developing reproducible workflows to analyse scientific data and building software tools. Special focues lay on building models for pattern detection in Earth observation data using deep neural networks and machine learning, applying techniques to assess model trust and model applicability, implementing collaborative software development principals for automating development environments and utilizing machine-to-machine communication. The contents of the course are theoretically introduced, before they are practically applied and implemented using programming languages such as R or Python.

Intended learning outcomes

Participants learn the skills to develop reproducible workflows for data analysis and how to build there own tools to do so. An important learning aim is to develop a profound transfer knowledge that enables participants to answer questions such as the following ones: Why is reprodubility important in science? How can analytical workflows be designed to be as reproduible as possible? How can trustworthiness and applicability of machine learning models be assessed and quantified, especially since the reproducibility of training such models is difficult? Challenges, opportunities, limitiations and risks of the introduced methods are discussed. Understanding such intuitively is another important learning aim.

Courses (type, number of weekly contact hours, language — if other than German)

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Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) presentation (approx. 30 minutes) or b) preparing a poster (approx. 10 hours total) or c) term paper (approx. 15 pages)
Assessment offered: Once a year, summer semester
Language of assessment: English or German (assessment will be held in English; in addition, the examiner may, where possible, decide to hold assessment in German)
creditable for bonus

Allocation of places

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Additional information

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Workload

150 h

Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Master's degree (1 major) Applied Earth Observation and Geoanalysis (EAGLE) (2021)