Artificial Intelligence and Data Science in Earth Observation

Xiaoxiang Zhu

(German Aerospace Center, DLR)

15.01.2020, 16.00 (s.t.)

Department of Statistics, Ludwigstr. 33, Room 144

Geoinformation derived from Earth observation satellite data is indispensable for many scientific, governmental and planning tasks. Geoscience, atmospheric sciences, cartography, resource management, civil security, disaster relief, as well as planning and decision support are just a few examples. Furthermore, Earth observation has irreversibly arrived in the Big Data era, e.g. with ESA's Sentinel satellites and with the blooming of NewSpace companies. This requires not only new technological approaches to manage and process large amounts of data, but also new analysis methods. Here, methods of data science and artificial intelligence (AI), such as machine learning, become indispensable.

In this talk, explorative signal processing and machine learning algorithms, such as compressive sensing and deep learning, will be shown to significantly improve information retrieval from remote sensing data, and consequently lead to breakthroughs in geoscientific and environmental research. In particular, by the fusion of petabytes of EO data from satellite to social media, fermented with tailored and sophisticated data science algorithms, it is now possible to tackle unprecedented, large-scale, influential challenges, such as the mapping of global urbanization — one of the most important megatrends of global changes.