

AI and Data Science in Earth Observation

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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.

Short Biography:

Xiaoxiang Zhu is the Professor for Signal Processing in Earth Observation at the Technical University of Munich, the head of the department Earth Observation Data Science at the German Aerospace Center, the Director of the international AI future Lab "AI4EO", the co-spokeswoman of the Munich Data Science Research School (MUDS), and the head of the Helmholtz Artificial Intelligence – Research Field "Aeronautics, Space and Transport". Her main research interests are remote sensing and Earth observation, signal processing, machine learning and data science, with a special application focus on global urban mapping.