

11TH ANNUAL SYMPOSIUM FOR DATA SCIENCE & INFORMATICS

Artificial Intelligence and Quantum Computing for Earth Observation: Towards the Digital Twin Earth

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The Earth is facing unprecedented climatic, geomorphologic, environmental and anthropogenic changes, which require global scale observation and monitoring. Thus a multitude of new orbital and suborbital Earth Observation (EO) sensors and mission are in operation or will be soon launched. The interest is in a global understanding involving observation of large extended areas, and long periods of time, with a broad variety of EO sensors. The collected EO data volumes are thus increasing immensely with a rate of many Terabytes of data a day. With the current EO technologies these figure will be soon amplified, the horizons are beyond Zettabytes of data. The challenge is the exploration of these data and the timely delivery of focused information and knowledge in a simple understandable format.

The lecture will present an overview of the European Earth Observation missions and programs focused on global warming and climate change as rising of the sea level, increasing levels of ocean acidification, frequent and extreme events such as floods, heat waves or draughts, also addressing the effects of population growth like, the pressures on fresh water, food, or on land and marine ecosystems.

The proposed solution for monitoring and predicting Earth processes is the Digital Twin Earth (DTE), aiming to provide capabilities to EO implementing a dynamic, digital replica of our planet which accurately mimics Earth's behaviour. The AI and quantum computing paradigm take a central role in Big EO Data analytics. The lecture will overview recent results for multispectral and SAR information extraction in support of the DTE implementation with applications for natural hazards monitoring, polar sea-ice processes or coastline understanding, or environmental indices extraction.



Friday, August 19

9:00am-10:00am

N201 Memorial Union

Zoom ([Register for Link](#))

MOST SESSIONS WILL BE AVAILABLE IN PERSON AND ON ZOOM. PLEASE REGISTER TO GET THE FULL SYMPOSIUM SCHEDULE AND ACCESS TO THE ZOOM LINK.



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