## Machine Learning Conference for X-Ray and Neutron-Based Experiments, Munich 2024



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## KI4D4E: Machine Learning Approach for Digital Volume Correlation in 4D Computed Tomography Data at Synchrotron Radiation Beamlines

Tuesday 9 April 2024 18:30 (20 minutes)

The Helmholtz-Zentrum Hereon is operating imaging beamlines for X-ray tomography (P05 IBL, P07 HEMS) for academic and industrial users at the synchrotron radiation source PETRA III at DESY in Hamburg, Germany. The high X-ray flux density and coherence of synchrotron radiation enable high-resolution in situ/operando tomography experiments. Here, large amounts of 4D data are collected from a wide variety of samples, which is challenging to reconstruct, process, and analyze. In this multi-disciplinary project - KI4D4E, we utilize modern machine learning methods for the data processing of synchrotron-radiation tomography experiments, such as micro- and nano-CT simulation, denoising and artifact removal, phase retrieval, and digital volume correlation.

In this talk, we will present the methodologies and challenges to apply state-of-arts machine learning methods to digital volume correlation for the data analysis of biodegradable implant materials based on the highresolution micro-CT datasets.

Primary author: WONG, Tak Ming (Helmholtz-Zentrum Hereon)

**Co-authors:** ZELLER-PLUMHOFF, Berit (Helmholtz-Zentrum Hereon); MOOSMAN, Julian (Helmholtz-Zentrum hereon)

Presenter: WONG, Tak Ming (Helmholtz-Zentrum Hereon)

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