MATTER AND
TECHNOLOGIES

Contribution ID: **96**   Type: **Poster with speed talk**

Software-Defined-DAQ: Towards scientific data-acquisition and processing in the cloud

Monday 9 October 2023 18:10 (5 minutes)

With careful consideration of respective interfaces, both on the side of electronics, as well as user-interfaces, it is possible to build data-acquisition (DAQ) systems of remarkable performance, using almost exclusively well-established consumer-grade computing methods and equipment. Consumer-grade computing equipment and software systems have made tremendous advancements in core metrics, both in regards to computation and data-transfer and stand as promising alternatives to the common practice in most large-scale scientific instrumentation to provide required DAQ functionality through the development of custom electronics.

Our group at the Institute for Data Processing and Electronics of the KIT is currently investigating the possibility of building heterogeneous DAQ systems that can offer unprecedented flexibility to scientists in the way of how raw data of an experiment is recorded and processed, by providing cloud-based infrastructures based on high-speed data transfer, powerful computing accelerators, programmable hardware and machine learning applications. We will showcase and discuss the envisioned systems, for which we have established the term 'Software-Defined-DAQ', as well as the current progress of our investigations in regards to hardware and software architecture.

Speed Talks

Normal

Primary authors: MOSTAFA, Jalal (Karlsruhe Institute of Technology); Dr TAN JEROME, Nicholas (KIT); CHILINGARYAN, Suren (IPE, KIT); DRITSCHLER, Timo (Karlsruhe Institue of Technology)

Co-authors: KOPMANN, Andreas (Karlsruhe Institute of Technology (KIT)); CASELLE, Michele (KIT)

Presenter: DRITSCHLER, Timo (Karlsruhe Institue of Technology)

Session Classification: Plenary III - Speedtalks

Track Classification: Data Management and Analysis