Progresses of Data Science in SHINE Project

Monday, 10 July 2023 16:00 (15 minutes)

The rapid development of X-ray free electron laser (EFEL) facilities has opened a new paradigm of X-ray measurement. They can deliver ultra-short and coherent x-ray pulses with extremely high brilliance, thus enabling the observation of the physical and chemical behaviors in condensed matters and biomaterials, at high spatial and temporal resolution simultaneously. Shanghai HIgh repetitioN rate XFEL and Extreme light facility (SHINE) has started its construction in April 2018 and may become one of most sophisticated XFEL facilities in the world.

The advanced detectors for XFEL allow an extremely high throughput of data rates and volumes. Big data has been identified as one of the major challenges in XFEL experiments, e.g. serial femtosecond crystallography and single-particle imaging. Dedicated data center and DAQ system shall be developed to meet the requirement of data acquisition, real-time analysis, and big data management of various instruments. A RD; data platform has already been built for the high throughput data processing based on high performance cluster as well as cloud computing. Algorithms and softwares of data acquisition, data management and analysis for tackling XFEL big data are also under development. In this presentation, most recent progresses of SHINE data science will be reported as well as envision of next decade.

Summary

Primary authors: Prof. FAN, Haiwei (ShanghaiTech University); Prof. HUAI, Ping (ShanghaiTech University)

Co-authors: Dr YIN, Congcong (Shanghai Advanced Research Institute CAS); Ms LEI, Lei (ShanghaiTech University); Dr SHI, Wujun (ShanghaiTech University); Dr ZHANG, Xiaofeng (ShanghaiTech University); Dr YIN, Yaru (ShanghaiTech University); Dr LI, Zhengheng (ShanghaiTech University)

Presenter: Prof. HUAI, Ping (ShanghaiTech University)

Session Classification: 先进光源数据与软件

Track Classification: 先进光源数据与软件