AI-SCOPE: AI-Driven Enhancement of Surface Scattering Data for Open Science Platforms Across Europe

OSCARS
Open Science Clusters' Action
for Research & Society

PaNOSC
Photon and Neutron Science

AI-SCOPE engages the photon and neutron (PaN) science community to enhance data FAIRness and beamtime efficiency, by introducing a live AI analysis tool for surface scattering experiments. By applying it to a diverse array of pre-existing scattering data and enabling live analysis during experiments, it will create a well-curated dataset with detailed annotations in EOSC indexed databases, and lay the groundwork for more uploads with FAIR metadata in the future.

Challenge

The main challenge of the AI-SCOPE project is to increase the frequency and quality of FAIR-compliant data submissions to EOSC-indexed databases, such as ESRF data portal or Zenodo, thereby addressing the current lack of well-annotated surface scattering data.

Solution

A sophisticated AI analysis tool for surface scattering experiments that performs an automated initial analysis, and simultaneously generates rich metadata annotations. This dual capability allows streamlining research workflows and gives "live" feedback during experiments at large-scale facilities.

Scientific Impact

By automating the analysis processes and enriching datasets with preliminary insights, these innovations enable a more comprehensive exploration of experimental data. This not only accelerates the discovery of novel materials but also facilitates meta-studies and machine learning applications in materials discovery.

Partners

University of Graz, SlovakAcademy of Sciences (SAS), Tübingen University (UTÜB)