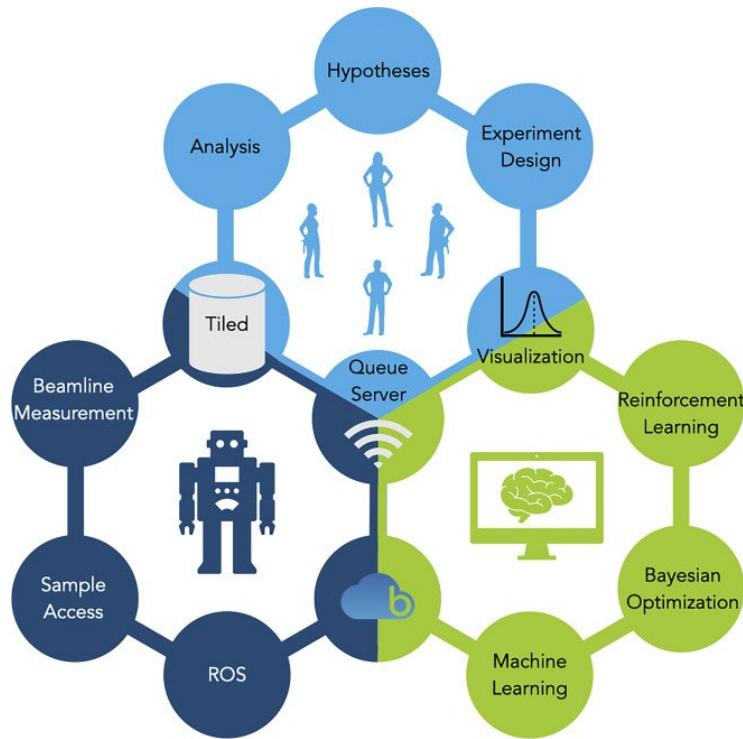# An "Internet of Things" Approach to Enterprise Beamlines

Schematic of the human-AI facility interface.

National Synchrotron Light Source II

Scientific Achievement

Scientists propose the world's first "internet of things" analysis engine to link multi-modal, self-driving (AI-based), enterprise beamlines, which are instrument end stations designed for high-throughput characterization and resolution of materials.

Significance and Impact

Enterprise beamlines are a basis of next-generation materials acceleration platforms (MAPs), which are dedicated to the discovery of new materials. This proposal suggests an advanced MAP for more collaborative, efficient, impactful discovery.

Research Details

- The project's core components include using the Bluesky framework across multiple end stations in concert, flexible automation for sample preparation and transport, and optimization for efficient exploration of samples in real time and on multiple beamlines.
- By operating existing end stations, it can be deployed without constructing any new beamlines.
- The project also creates opportunities for the future NSLS-II beamlines to integrate this technology.