Self-driving Multimodal Studies at User Facilities

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Multimodal characterization is commonly required for understanding materials. User facilities possess the infrastructure to perform these measurements, albeit in serial over days to months. In this work, we describe a unified multimodal measurement of a single sample library at distant instruments, driven by a concert of distributed agents that use analysis from each modality to inform the direction of the other in real time. Powered by the Bluesky project at the National Synchrotron Light Source II, this experiment was a world's first for beamline science, and provides a blueprint for future approaches to multimodal and multifidelity experiments at user facilities. To this end, we provide a focus on the infrastructure that enables these advanced capabilities.

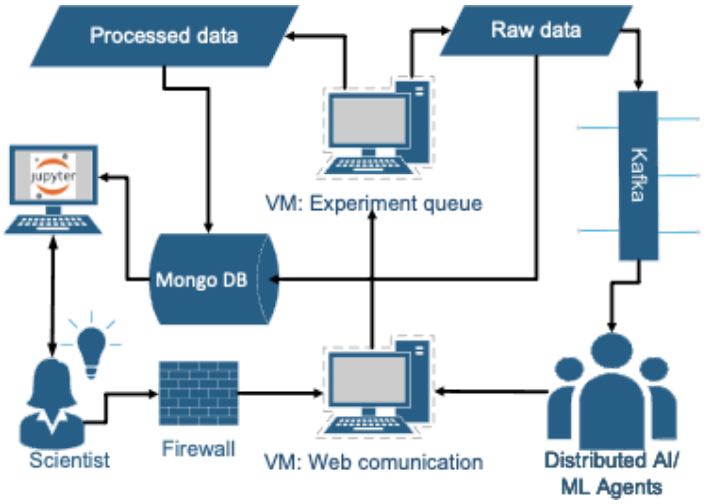

Figure 1