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AI & ML at Diamond –One Year On

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In this talk I would like to present an overview of the progress made at Diamond Light Source since the 2023 meeting at the ALS. Since April 2023 we have internally held two workshops in order to come up with a roadmap, which I will discuss, as well as delivering internal training, in collaboration with the Scientific Machine Learning group on our campus.

In addition to this we have identified two key infrastructural areas that we believe require addressing, namely where latency is acceptable and where latency has to be minimised or ‘eliminated’. These two scenarios present distinctly different challenges with regards to the type computing infrastructure required, its proximity to experimental hardware and the software stack that sits on top of the hardware.

With this infrastructure in place we aspire to provide the resiliency and longevity that beamline critical software demands by providing appropriate APIs & hooks, devising guidelines on developer best practice and establishing pathways to software sustainability when deploying algorithms and models at facilities. All of which will also have to provide a flexible working environment for developers allowing for the deployment of pre-existing tools as well as the development of new, novel, algorithms as well.

This endeavour will not be easy; however, I would like to present our ideas to foster both discussion and collaboration in this area as we all look to deploying new algorithms and models more routinely at our respective facilities and, potentially, in a more unified pattern. Preferably this pattern would be somewhat in line with industry standards, to make use of the large amount of resource already being poured into the greater AI & ML space worldwide, albeit tailored to our needs.

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