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Development of a Machine Learning tool for LEBT Optimisation at ISIS

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At the ISIS Neutron and Muon Source, accelerator tuning has traditionally been a manual process, relying on expert operators to adjust control system parameters to achieve optimal beam efficiency and intensity. With the recent migration of the control system to EPICS and the availability of optimization frameworks such as Xopt, we have initiated the first efforts to automate tuning of the Low Energy Beam Transport (LEBT) at ISIS. In this presentation, we outline the specific optimization problem being addressed, detail the measures taken to ensure safe application of Bayesian Optimisation (BO), and share results from our optimization runs. We will also present the graphical user interface (GUI) that we have built for our operators for running optimisations during user cycle. Finally, we discuss the challenges encountered during this process and outline future work aimed at overcoming these limitations and improving automation reliability.

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

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