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Accelerator Drift Compensation via a Modified MG-GPO Algorithm

Sunday 10 August 2025 15:00 (3 hours)

Performance drift over long periods of operation due to changes in machines settings or the environment has been a longstanding problem for particle accelerators. Algorithms which are capable of tuning machine settings while keeping the performance within a desired threshold can be used to compensate for such drifts. We have developed a modified version of the Multi-Generation Gaussian Process Optimizer (MG-GPO) which is capable of tuning accelerator settings during user operation. The modified algorithm uses Gaussian Process regression to predict the performance of potential trial settings and removes ones with a high probability of giving too poor of a performance before selection for evaluation on the machine. The modified MG-GPO has been tested on analytic functions and applied to the SPEAR3 kicker-bump matching problem as a proof of concept. It is expected that the modified MG-GPO will be applied to maintain optimal trajectory of the beam injected into the SPEAR3 storage ring.

Please consider my poster for contributed oral presentation

No

Would you like to submit this poster in student poster session on Sunday (August 10th)

Yes

Footnotes

Funding Agency

I have read and accept the Privacy Policy Statement

Yes

Author: YEUNG, Ryan (Michigan State University)

Co-authors: HUANG, Xiaobiao (SLAC National Accelerator Laboratory); HAO, Yue (Facility for Rare Isotope Beams); ZHANG, Zhe (SLAC National Accelerator Laboratory)

Presenter: YEUNG, Ryan (Michigan State University)

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