Contribution ID: **167** Type: **not specified**

Machine-Learning Enhanced Optimal Detector Design

Wednesday 19 June 2024 12:01 (12 minutes)

In this talk, we address the challenge of optimizing detector design for advanced tasks in high energy particle physics. Our goal is to develop differentiable pipelines for the optimization of typical metrics sought out in particle physics applications. The approach is tailored with a focus on several critical design aspects, including optimizing detector performance, enhancing sensitivity to discoveries, and adhering to cost constraints. We explore innovative machine learning-based methods leveraging mutual information and generative AI. We present initial promising results from studies utilizing both methodologies and discuss potential directions for further development.

Authors: SINHA, Atul; FLEURET, François; KIESELER, Jan (KIT - Karlsruhe Institute of Technology (DE)); WOZNIAK, Kinga Anna (Universite de Geneve (CH)); MULLIGAN, Stephen (Universite de Genève); GOLLING, Tobias (Universite de Geneve (CH))

Presenter: WOZNIAK, Kinga Anna (Universite de Geneve (CH))

Session Classification: ML Workshop