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Plans and strategy for edge AI/ML at the Electron-Ion Collider at Brookhaven National Laboratory

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Scheduled to begin Operations in 2035, the Electron-Ion Collider (EIC) is being built at Brookhaven National Laboratory (BNL) and will be the only operating particle collider in the United States. It may also be the only large collider built in the world in the next 20-30 years, during the "Age of Artificial Intelligence (AI)" . Recognizing the potential for AI and machine learning (ML) to enhance operations and create more research opportunities, the EIC is being envisioned and designed as a large-scale AI-ready state-of-the-art facility. Specifically, it will support three core areas of AI/ML capabilities, referred to as Edge, End-to-End, and Bottom-Up. Edge capabilities are intended to address what are expected to be some of the most demanding AI/ML applications in the world in terms of timescales by anticipating the infrastructure, hardware, and local compute resources needed for success. At the same time, considerable care must be taken to ensure that these capabilities are manifested in an efficient, safe, and secure Controls ecosystem and Operations environment. We report on our plans and strategy for high-performance edge AI/ML at the EIC.

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Footnotes

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