

## 5th ICFA Beam Dynamics Mini-Workshop on Machine Learning for Particle Accelerators



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### Digital Assistants using LLMs for the Electron Ion Collider Project

Brookhaven National Laboratory is home to future Electron Ion Collider (EIC). The EIC will collide electrons with protons and nuclei to produce snapshots of particles' internal structure. This will allow us to study the role of gluons in the matter within and all around us. As the project expands, the growing collection of technical documentation across multiple sub-systems creates challenges in information access and knowledge sharing. Leveraging local LLMs offer greater data privacy, security, and compliance control since possible sensitive information never leaves internal systems, unlike with commercial public cloud-based systems. We propose a digital assistant framework utilizing the Ollama API with locally-deployed LLMs, ensuring data privacy while maintaining full control over the information processing pipeline. Our approach combines open-source models with natural language processing techniques to a domain-specific assistant that processes EIC technical repositories, accelerating project development by providing rapid access to critical information. We will discuss techniques, applications, and use cases of this developed digital assistant.

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