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Towards Unlocking Insights from Logbooks Using AI

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Electronic logbooks contain valuable information about activities and events concerning their associated particle accelerator facilities. However, the highly technical nature of logbook entries can hinder their usability and automation. As natural language processing (NLP) continues advancing, it presents opportunities to address various challenges that logbooks present. This work explores jointly testing a tailored Retrieval Augmented Generation (RAG) model for enhancing the usability of particle accelerator logbooks at institutes like DESY, BESSY, Fermilab, BNL, SLAC, and LBNL. The RAG model is using a corpus built on logbook contributions, and aims to unlock insights from logbooks by leveraging retrieval over facility datasets, including discussion about potential multimodal sources. Our goals are to increase the FAIR-ness (findability, accessibility, interoperability, and reusability) of logbooks by exploiting their information content to streamline everyday use, enable macro-analysis for root cause analysis, and facilitate problem-solving automation.

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