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Author

Josip Zic

Organization

McMaster University, Hamilton, ON

Title

Dangers of Using Artificial Intelligence for Regulatory Compliance and Efficiency

Abstract

Regulatory requirements and industry standards continue to evolve, to address new and expanding nuclear technologies. These regulatory changes must be evaluated by existing licensees to confirm compliance or identify gaps. Many organizations have turned to using Artificial Intelligence platforms to evaluate how to implement new regulations, perform gap assessments and prepare licensed documents or applications. All organizations implementing publicly available Artificial Intelligence platforms should be aware of challenges, potential errors and confidentiality associated with the use of these tools for regulatory compliance and efficiency gains. Ensuring regulatory compliance in the nuclear sector demands absolute thoroughness: even minor omissions or misdirections can lead to unacceptable safety risks and legal consequences. This paper evaluates the retrieval component of a Retrieval-Augmented Generation system in the context of nuclear licensing, focusing on whether a standard embedding-based document retrieval method (using cosine similarity on text embeddings) can meet the high accuracy requirements of this safety-critical domain.