

Semantic Representation Learning and Information Integration of BIM and Regulations

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ABSTRACT

Automated checking of the compliance of building information modeling (BIM)-based building designs with relevant codes and regulations requires bridging the semantic gap between the Industry Foundation Classes (IFC) schema and the natural language. In most of the existing automated compliance checking (ACC) systems, the integration of the IFC schema and natural language is realized through hardcoding or predefined rules, ontologies, or dictionaries. These methods require intensive manual engineering effort and are often rigid and difficult to generalize. There is, thus, a need for an automated, and meanwhile flexible and generalizable information integration method. To address this need, this paper leverages transformer-based language models to learn the semantic representations of concepts in the building information models (BIMs) and regulatory documents. An automated IFC-regulatory information integration approach based on these learned semantic representations is proposed. The preliminary experimental results show that the proposed approach achieved promising performance – an accuracy of 80% – on integrating IFC and regulatory concepts.