

A Large Language Model-Driven Method for Automated Building Energy Model Generation

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Abstract : The development of building energy models (BEM) required for architectural design and analysis is a time-consuming and complex process, demanding a deep understanding and proficient use of simulation software. To streamline the generation of complex building energy models, this study proposes an automated method for generating building energy models using a large language model and the BEM library aimed at improving the efficiency of model generation. This method leverages a large language model to parse user-specified requirements for target building models, extracting key features such as building location, window-to-wall ratio, and thermal performance of the building envelope. The BEM library is utilized to retrieve energy models that match the target building's characteristics, serving as reference information for the large language model to enhance the accuracy and relevance of the generated model, allowing for the creation of a building energy model that adapts to the user's modeling requirements. This study enables the automatic creation of building energy models based on natural language inputs, reducing the professional expertise required for model development while significantly decreasing the time and complexity of manual configuration. In summary, this study provides an efficient and intelligent solution for building energy analysis and simulation, demonstrating the potential of a large language model in the field of building simulation and performance modeling.

Keywords : artificial intelligence, building energy modelling, building simulation, large language model

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