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Managing structural health monitoring data using building information modeling

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One of the issues in structural health monitoring (SHM) and any other monitoring systems such as indoor air quality monitoring have to deal with huge amount of original raw data as well as all post processed data which can add up to hundreds of Gigabytes or even more. Therefore, effective data management is a significant task which cannot be implemented properly except by using appropriate tools. Building information modeling (BIM) has emerged as a powerful data management tool by obtaining, sorting, storing, sharing and recalling data and provide a digital environment of them. Using BIM in monitoring systems such as SHM will be an effective way to solve their data management issue. Making BIM dynamic by recording the real time SHM data will be effective for engineers, facility managers and owners by providing updated information about the ongoing health and state of various parts of the building. The main objective of this study is to focus on using BIM in managing the data of monitoring systems in particular in SHM system. For this purpose, a four story office building is modelled in Revit architecture and Revit structure in this study to demonstrate the feasibility of creating and visualizing the information about the sensors installed in the structure for the purpose of structural health and air quality monitoring. Also, the BIM model is made dynamic by linking relevant external resources related to the sensors such that the sensor data can be managed in real time and the information related to the sensors is up to date. This research lays the foundation for further implementation of using BIM in SHM purpose.

Biography

Mojtaba Valinejadshoubi is currently the PhD student of Civil Engineering at Concordia University of Montreal, Canada. His research interests include application of BIM in SHM, modular building construction, construction project management, energy modeling and seismic risk assessment. He has authored 23 international articles, including 13 international conference papers and 10 international journal papers, and one national patent application till now. He is the Member of Golden Key International Honour Society in Canada. He won several scholarships and awards such as the Award of Excellence Certificate from Faculty of Civil Engineering at UTM, Concordia University Full Tuition Recruitment Award, CN Graduate Fellowships in railway dynamics, UNIPRS and UNRS Central 50:50 scholarships from the University of Newcastle Australia.

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