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RESEARCH PAPER

Development of a Bridge Maintenance System Using Bridge Information Modeling

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ABSTRACT: Bridges play a critical role in the transportation system network; accordingly, assuring satisfaction with the service level of these structures is vital for bridge maintenance managers. Thus, it is vital to determine the optimum bridge maintenance plan (i.e., the optimum timing and type of repair activities applied to the bridge elements) considering the budget limitations. To optimize the bridge maintenance plan, some researchers have focused on developing optimization models, including the Genetic Algorithm (GA). However, a few studies have employed Bridge Information Modeling (BrIM) to enhance bridge maintenance management. This study focuses on developing an integrated framework based on BrIM and bridge maintenance optimization to utilize visualization capabilities of BrIM to assist maintenance managers in making decisions. The presented framework optimizes the bridge maintenance plan at the sub-element level. The BrIM automatically feeds into the developed GA optimization system. The introduced framework is successfully verified using a real-world case study.

Keywords: Bridge Information Modeling (BrIM), Bridge Maintenance Plan, Genetic Algorithm (GA), Maintenance Optimization.

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