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Titel des Beitrags: 3D Building model-based life-cycle management for reinforced concrete bridges

Abstract: Since large parts of western countries’ infrastructure have been erected in the early 1960’s, many infrastructure buildings such as concrete bridges are now entering a critical age, where the need for continuous inspection and reconditioning is becoming apparent. Facing these challenges, many national highway authorities have developed computer systems that allow for the management of data collected during bridge inspections. Based on this data the current condition of the inspected bridge is manually assessed and, if necessary, revivification measurements are planned. The life-cycle management tool presented in this paper goes one step further: It allows a 3D model-based, component-wise collection of detailed material and inspection data and a mostly automated computation of the bridge's future state by using probabilistic deterioration models for all individual components and hierarchical aggregation of the components’ conditions. The basis of the component-wise input and processing of all relevant data forms a hierarchical 3D building model, which is described in detail in the paper. The particularity of our approach is that the building model can easily be adapted to specific building types or the special demands of regulatory authorities by means of an explicitly available meta-model.