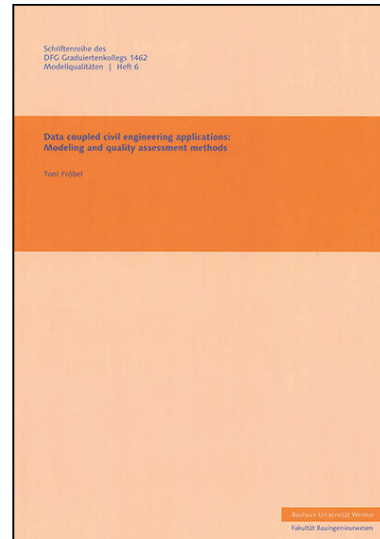


Toni Fröbel

Data coupled civil engineering applications: Modeling and quality assessment methods

The planning process in civil engineering is highly complex and not manageable in its entirety. The state of the art decomposes complex tasks into smaller, manageable sub-tasks. Due to the close interrelatedness of the sub-tasks, it is essential to couple them. However, from a software engineering point of view, this is quite challenging to do because of the numerous incompatible software applications on the market.

This study is concerned with two main objectives: The first is the generic formulation of coupling strategies in order to support engineers in the implementation and selection of adequate coupling strategies. This has been achieved by the use of a coupling pattern language combined with a four-layered, metamodel architecture, whose applicability has been performed on a real coupling scenario. The second one is the quality assessment of coupled software. This has been developed based on the evaluated schema mapping. This approach has been described using mathematical expressions derived from the set theory and graph theory by taking the various mapping patterns into account. Moreover, the coupling quality has been evaluated within the formalization process by considering the uncertainties that arise during mapping and has resulted in global quality values, which can be used by the user to assess the exchange.



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