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Badr SIALA
Team ACADIE - IRIT

Formal decomposition of Event-B centralized specifications: application to BIP distributed systems

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Abstract: The scientific framework of this thesis is the formal decomposition of the centralized specifications Event-B applied to distributed systems based on the BIP (Behavior, Interaction, Priority) component framework. It suggests a top-down approach to the development of correct by construction distributed systems by judiciously combining Event-B and BIP. The proposed approach consists in three steps: Fragmentation, Distribution and Generation of BIP code. We introduce two key concepts, Fragmentation and Distribution, which are considered as two kinds of automatic refinement of Event-B models. They are parameterized using two appropriate DSL. This thesis also contributes to the problem of code generation from Event-B models resulting from the Distribution step. Accordingly, we deal with both architectural and behavioral aspects. A special care has been devoted to the implementation and the experimentation of this approach. To achieve this, we have used the IDM approach for tooling and the Electronic Hotel Key System for experimentation.