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A Refinement Strategy Coupling Event-B and Planning Domain Definition Language (PDDL) for Planning Problems

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Abstract : Automatic planning has a de facto standard language called Planning Domain Definition Language (PDDL) for describing planning problems. It aims to formalize the planning problems described by the concept of state space. PDDL-related dynamic analysis tools, namely planners and validators, are insufficient for verifying and validating PDDL descriptions. Indeed, these tools made it possible to detect errors a posteriori by means of test activity. In this paper, we recommend a formal approach coupling the two languages Event-B and PDDL, for automatic planning. Event-B is used for formal modeling by stepwise refinement with mathematical proofs of planning problems. Thus, this paper proposes a refinement strategy allowing to obtain reliable PDDL descriptions from an ultimate Event-B model correct by construction. The ultimate Event-B model, correct by construction which is supposed to be translatable into PDDL, is automatically translated into PDDL using our MDE Event-B2PDDL tool.

Keywords : code generation, event-b, PDDL, refinement strategy, translation rules
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