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A compiler for MSVL and its applications. (English) Zbl 1407.68096

Summary: In this paper, we present a method for implementing a compiler called MC for Modeling, Simulation and Verification Language (MSVL) based on LLVM. MC accepts a well formed MSVL program as input and generates an executable binary code. Different from other compilers, MC can be used not only to compile programs but also to model and verify programs. The details of implementation including the architecture design, lexical, syntactic and semantic analysis, as well as preprocessing and scheduling algorithms. Besides, we show MC can be utilized as an infrastructure for Artificial Intelligence (AI) planning. Several examples are given to show applications of MC in modeling and verifying programs, as well as AI planning.

MSC:
68N20 Theory of compilers and interpreters
68Q60 Specification and verification (program logics, model checking, etc.)
68T20 Problem solving in the context of artificial intelligence (heuristics, search strategies, etc.)

Keywords:
MSVL; model checking; compiler; verification; AI planning

Software:
JPAX; LLVM; SHOP2; SPIN; NuSMV; RiTHM; CBMC; BLAST

Full Text: DOI

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