Zhou, Ping; Hooman, Jozef; Kuiper, Ruurd

Compositional verification of real-time systems with explicit clock temporal logic. (English)  

Summary: To specify and verify real-time systems, we consider a real-time version of temporal logic called Explicit Clock Temporal Logic. Timing properties are specified by extending the classical framework of temporal logic with a special variable which explicitly refers to a global notion of time. Programs are written in an Occam-like real-time language with synchronous message passing. To show that a program satisfies a specification, we formulate a proof system which is proved to be sound and relatively complete. The proof system is compositional, which makes it possible to decompose the design of a large system into the design of subsystems. This is shown by the verification of a small part of an avionics system.

MSC:
68Q60 Specification and verification (program logics, model checking, etc.)  
03B45 Modal logic (including the logic of norms)  
68M99 Computer system organization  
68T27 Logic in artificial intelligence  
68U99 Computing methodologies and applications

Keywords:
explicit clock temporal logic; real-time systems

Full Text: DOI

References:


