Object-oriented development of the embedded system based on Petri-nets

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Abstract

Embedded systems are an emerging field that has commanded attention and support from the industrial community. They have been a part of daily life today. However, complex behaviors and a lack of reusability and modularization have been obstacles to the development of successful embedded systems. A typical issue or challenge of embedded system design lies on the synthesis of software and hardware. Currently, a paradigm shift towards object-oriented (OO) techniques has been advocated in hope of increasing the reusability and modularization. In this paper, an object-oriented development method of the embedded system based on Petri-nets is proposed. The concurrent ability of Petri-nets assists the concurrent co-design of embedded systems synchronously. In addition, the paper applies the reachability tree and the generalized label-correcting (GLC) algorithm to analyze and to validate the designed processes in object-oriented Petri-net models. This solution approach is novel in a sense that by combining various operators and comparators, different types of developing problems in embedded systems can be solved with one algorithm for different values of the initial node.
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