

研究、探讨

定义及验证UML Statechart图中的数据流语义

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摘要 在传统的UML Statechart图中加入了数据流对象后, 因为UML Statechart图缺乏精确的数据流语义, 所以不适合应用UML Statechart图对 workflow 中的数据流进行建模并验证其正确性。为了解决这一问题, 选择标记转换系统 (LTS) 作为语义域, 并用结构化操作语义 (SOS) 分两步定义了UML Statechart图的数据流语义, 为 workflow 中的数据流正确性验证奠定了基础。在此基础上, 使用时序逻辑公式表示数据流所需满足的性质, 在验证数据流正确性之前, 给出了将它的UML Statechart图模型转化为可达状态迁移图的算法, 最后通过模型检测算法验证数据流的正确性。

关键词 [统一建模语言 \(UML\)](#) [UML Statechart图](#) [数据流语义](#) [时序逻辑](#) [验证](#) [模型检测](#)

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Definition and verification of semantics of data flow in UML Statecharts

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Abstract

After being integrated with data flow objects, traditional UML Statecharts are not suited for modeling and the verification of the data flow in the workflows due to the lack of the exact semantics of the data flow. To solve the problem, LTS is selected as the semantic field, and the semantics of data flow are defined with SOS in two steps so as to lay the foundation for the verification of the data flow of the workflow. Based on this, temporal logic formula is used to express the properties that the data flow must satisfy, before the verification, an algorithm transforming the UML Statecharts model into reachable state transition graph is given, finally the correctness of the data flow is verified by model checking technique.

Key words [Unified Modeling Language \(UML\)](#) [UML Statecharts](#) [semantics of data flow](#) [temporal logic](#) [verification](#) [model checking](#)

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