Behavior Descriptions of Structure-Complex Petri Nets Based on Synchronous Composition

ZENG Qing-Tian

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ZENG Qing-Tian,   (Institute of Computing Technology, The Chinese Academy of Sciences, Beijing 100080, China)(Department of Computer Science, Shandong University of Science and Technology, Taian 271019, China)(Graduate School, The Chinese Academy of Sciences, Beijing 100039, China)
Authors information: ZENG Qing-Tian was born in 1976. He is a Ph.D. candidate at the Institute of Computing Technology, the Chinese Academy of Sciences. His research interests include large-scale knowledge processing and ontology analysis, V&V of knowledge-based system, Petri net theory and applications, and mathematical knowledge acquisition and analysis.
Corresponding author: ZENG Qing-Tian, Phn: +86-10-62565533 ext 5668, E-mail: zqtian@ict.ac.cn, zqtian@163.com

Abstract
In order to specify the behaviors of structure-complex Petri nets, the concept of synchronous composition is extended and a method is presented, with which a given structure-complex Petri net can be obtained through the synchronous composition of a set of structure-simple Petri nets, namely S-nets. Firstly, the language characters of S-nets are analyzed with details and the methods to obtain their language expressions are presented. With the synchronous intersection operation of Petri net languages, the language relationships between the structure-complex Petri net and the set of S-nets can be expressed. Based on these works, an algorithm to specify the behaviors of Petri nets especially structure-complex systems is obtained.

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摘要
首先分析了一类结构简单的Petri网((S-网的语言性质,得到了它们的行为描述方法.拓展了Petri网同步合成的概念,证明了给定一个结构复杂的Petri网都可通过一组S-网的同步合成运算而得到,并给出了相应的求解算法.引入语言的同步交运算,分析了结构复杂的Petri网与其同步合成子网之间的行为关系,给出了结构复杂Petri网的行为描述算法,为利用网语言分析实际系统的行为特征提供了可靠的理论依据和方法.

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