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## 下一代通信软件中的特征冲突检测

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### Abstract

Features denote the extensions of the basic function set of the communication software, while Feature Interactions (FIs) mean the unexpected interference between the features. The paper studies the FIs in the next generation communication software mainly on the aspect of the distributed implementation and deployment of the features. Based on the Communication Finite State Machine (CFSM) model, the authors design an FI detection method using the system verification technique. For the state explosion problem during verification, an optimization scheme is presented to reduce the complexity. Its validity is proved in theory and illustrated by examples.

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### 摘要

通信软件在其基本服务基础上进行扩展而得到的附加功能被称为特征,由于特征之间的相互干扰所导致的软件系统的异常行为被称为特征冲突问题.研究了下一代通信软件中由于特征的分布式实现和部署而产生的特征冲突问题.基于通信有限状态机模型,采用系统验证的技术设计了一种分布式特征冲突检测方案;对于生成全局状态自动机所导致的状态爆炸问题,提出了4条消除冗余状态和变迁的优化规则.对所提出的方案及优化策略进行了理论上的证明和实际中的验证,结果均表明,该方案对于通信软件中的特征冲突检测是有效的.

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