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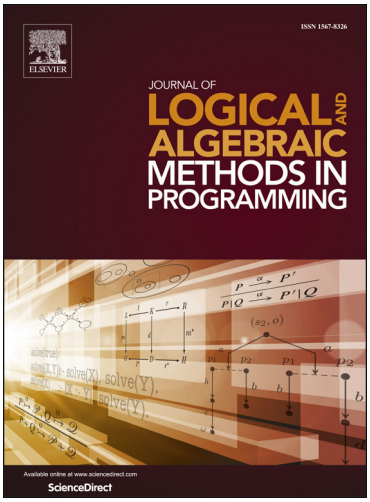

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Semantics of global view of choreographies[☆]

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Abstract

We propose two abstract semantics of the global view of choreographies given in terms of partial orders. The first semantics is formalised as pomsets of communication events while the second one is based on hypergraphs of events. These semantics can accommodate different levels of abstractions. We discuss the adequacy of our models by considering their relation with communicating machines, that we use to formalise the local view. Our approach increases expressiveness and allows us to overcome some limitations that affect alternative semantics of global views. This will be illustrated by discussing some interesting examples. Finally, we show that the two semantics are equivalent and have different merits. More precisely, the semantics based on pomsets yields a more elegant presentation, but it is less suitable for implementation. The semantics based on hypergraphs instead is amenable to a straightforward implementation.

Keywords: Choreography, communicating finite-state machines, global graphs, hypergraphs, pomsets, semantics.

1. Introduction

Distributed applications are nowadays widespread. Rarely applications are stand-alone anymore: software is today conceived to dynamically interact with other applications. The combination of ubiquitous connectivity and the evolution of portable or wearable devices (such as smart phones or watches) practically changed the nature of software and it is also determining new approaches to software development [26]. Big vendors as well as small software companies, have to satisfy the appetite of users who want data and applications 'always handy'. Also, software is becoming more and more important as it increasingly deals with delicate societal and economical aspects. Distributed applications are used in many aspects of our lives, from handling commercial transactions

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