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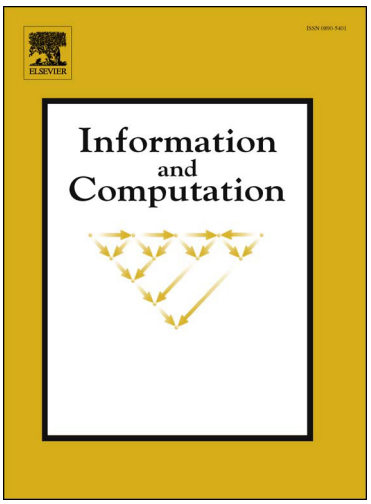

Nash Equilibria in Symmetric Graph Games with Partial Observation

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Nash Equilibria in Symmetric Graph Games with Partial Observation

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Abstract

We investigate a model for representing large multiplayer games, which satisfy strong symmetry properties. This model is made of multiple copies of an arena; each player plays in his own arena, and can partially observe what the other players do. Therefore, this game has partial information and symmetry constraints, which make the computation of Nash equilibria difficult. We show several undecidability results, and for bounded-memory strategies, we precisely characterize the complexity of computing pure Nash equilibria for qualitative objectives in this game model.

Keywords: Games on graphs, Network of systems, Symmetry, Nash equilibrium

1. Introduction

Multiplayer games. In the field of formal verification, games played on graphs extend the more classical Kripke structure with a way of modeling interactions between several components of a computerized system. Those types of games are intensively used as a tool to reason about and automatically synthesize (part of) reactive systems [1]. Consider a server granting access to a printer and connected to several clients. The clients may send requests to the server, and the server grants access to the printer depending

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