Revivals, stuckness and the hierarchy of CSP models. (English) Zbl 1171.68025

Summary: We give details of a new model for CSP introduced in response to work by C. Fournet, T. Hoare, S. K. Rajamani and J. Rehof [“Stuck-free conformance”, Lect. Notes Comput. Sci. 3114, 242–254 (2004; Zbl 1103.68612)]. This is the stable revivals model $\mathcal{R}$ alluded to in [J. N. Reed, A. W. Roscoe and J. E. Sinclair, “Responsiveness and stable revivals”, Formal Asp. Comput. 19, No. 3, 303–319 (2007; Zbl 1125.68077)]. We provide the full semantics for CSP in this model, indicate why this is operationally congruent, and provide proofs of the full abstraction properties asserted in that paper. We study the place of $\mathcal{R}$ in the hierarchy of CSP models, and show how this generates several extensions of $\mathcal{R}$ handling infinite behaviours. In doing this we discover more about the hierarchy and several known models within it. This includes results that show that the traces model, failures model and are new one are somehow “essential” or “Platonic”. We set out a number of conjectures and challenges for future workers in this area.

MSC: 68Q85 Models and methods for concurrent and distributed computing (process algebras, bisimulation, transition nets, etc.)
68Q60 Specification and verification (program logics, model checking, etc.)

Keywords: concurrency; CSP models; full abstraction

Software: FDR2

Full Text: DOI Link

References:


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.