Modeling discrete event systems with multiple initial states and partial state knowledge

S. Macchietto*, Nicholas J. Alsop, Ross J. Baird and Bing H. Chen

Department of Chemical Engineering, Imperial College London, London SW7 2AZ, UK

Abstract
The issue of state explosion arises in the synthesis and validation of controllers for Discrete Event Systems (DESs) for practical scale systems. In this work, we introduced the concepts of Procedural Controllers with multiple initial states (MIS) and Partial State Knowledge (PSK) to reduce the size and number of controllers required to meet a control objective. Methods are presented that enable the proper consideration of such controllers while preserving all the desirable properties of the Procedural Control Theory through an evolution of the pre-check theory (Alsop 1996).

Keywords: Sequential control, batch processing, multiple initial states, state explosion, procedural control theory, discrete event synthesis

* Corresponding author, Tel: +44 20 75945575, Fax: +44 20 75945604, email: s.macchietto@imperial.ac.uk