

## Self-Organization-Based Approach for Embedded Real-Time System Design

**Authors :** S. S. Bendib, L. W. Mouss, S. Kalla

**Abstract :** This paper proposes a self-organization-based approach for real-time systems design. The addressed issue is the mapping of an application onto an architecture of heterogeneous processors while optimizing both makespan and reliability. Since this problem is NP-hard, a heuristic algorithm is used to obtain efficiently approximate solutions. The proposed approach takes into consideration the quality as well as the diversity of solutions. Indeed, an alternate treatment of the two objectives allows to produce solutions of good quality while a self-organization approach based on the neighborhood structure is used to reorganize solutions and consequently to enhance their diversity. Produced solutions make different compromises between the makespan and the reliability giving the user the possibility to select the solution suited to his (her) needs.

**Keywords :** embedded real-time systems design, makespan, reliability, self-organization, compromises

**Conference Title :** ICCSOS 2021 : International Conference on Complex and Self-Organizing Systems

**Conference Location :** Prague, Czechia

**Conference Dates :** March 22-23, 2021