

## Preface

Welcome to the 16th volume of Transactions on Computational Collective Intelligence (TCCI). This volume of TCCI includes seven interesting and original papers selected via a peer-review process. The first paper, entitled “Non-intrusive Repair of Safety and Liveness Violations in Reactive Programs” by Harel et al., shows how, under certain conditions, programs written in the behavioral programming approach can be modified using automatically generated code modules. At the core of the presented approach is the ability of a thread of behavior to prevent the triggering of events from other threads. The proposed repair algorithms apply model checking of safety and liveness properties to the program and transform the counterexamples produced by the model-checker into corrective modules. In the second paper “Designing Adaptive Systems Using Teleo-Reactive Agents,” the authors Smith et al. provide a formal definition of adaptivity which is independent of any particular adaptivity mechanism and general enough to use with any specification notation. Then based on this definition, a framework for specifying the behavioral requirements of adaptive agents and MAS in a systematic way is presented. The third paper, “Towards Formal Modelling and Verification of Pervasive Computing Systems” by Liu et al., proposes the use of formal methods to analyse pervasive computing systems. It includes a formal modeling framework to cover the main characteristics of such systems, and identification and specification of the safety requirements as safety and liveness properties. Furthermore, based on the modeling framework, the authors propose an approach of verifying reasoning rules that are used in the middleware for perceiving the environment and making adaptation decisions. Experimental results show the usefulness of the presented approach in exploring system behaviors and revealing system design flaws such as information inconsistency and conflicting reminder services. In the fourth paper “Revisiting Agent-Based Models of Algorithmic Trading Strategies” the authors, Natalia Ponomareva and Anisoara Calinescu, present a method for identifying the most suitable market simulation type based on the specific market model to be investigated. Then the authors propose an extended model of the Bayesian execution strategy for Algorithmic Trading that aims at executing large orders discretely, in order to minimize the orders’ impact, while also hiding the traders’ intentions. The authors of the fifth paper “Self-explanation in Adaptive Systems based on Runtime Goal-Based Models” by Welsh et al., argue that a self-adaptive system’s behavior needs to be explained in terms of satisfaction of its requirements. Since self-adaptive system requirements may themselves be emergent, the authors propose the use of goal-based requirements models at runtime to offer self-explanation of how a system is meeting its requirements. In the sixth paper “A Higher-Order Agent Model with Contextual Planning Management for Ambient Systems” by Chaouche et al., the authors present a concrete software architecture dedicated to ambient intelligence features and requirements. The proposed behavioral model, called higher-order agent captures the evolution of the mental representation of the agent and that of its plan simultaneously. Plan expressions are written and composed using a

formal algebraic language, so that plans are built automatically and on the fly, and the updates of sub-plans are realized automatically according to the revising of intentions, hence maintaining the consistency of the agent. The last paper, entitled “An Ontological Consensus Augmented Framework for Collaborative Business Process Formulation” by Hoang et al., presents an ontological approach for forming collaboration of business processes agilely within a BizKB framework that allows to take into account the challenge of dynamically forming collaborative business processes. Moreover, the authors use the consensus theory in distributed knowledge processing in the presented method for service discovery.

TCCI is a peer-reviewed and authoritative journal dealing with the working potential of computational collective intelligence (CCI) methodologies and applications, as well as emerging issues of interest to academics and practitioners. The research area of CCI has been growing significantly in recent years and we are very thankful to everyone within the CCI research community who has supported the Transactions on Computational Collective Intelligence and its affiliated events including the International Conferences on Computational Collective Intelligence (ICCCI).

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