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Luis M. Camarinha-Matos · Hamideh Afsarmanesh
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Collaborative Networks of Cognitive Systems

19th IFIP WG 5.5 Working Conference
on Virtual Enterprises, PRO-VE 2018
Cardiff, UK, September 17–19, 2018
Proceedings

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Preface

Collaborative Networks and Cognition

Recent advances in artificial intelligence, specifically in the areas of machine learning, sensorial perception, reasoning, communication capabilities, and human–machine interaction, have led to a new generation of cognitive systems that fundamentally challenge the foundations of past information systems. Cognition becomes distributed across networks of smart things, smart systems, organizations, and people. Simultaneously, users are increasingly becoming connected and proactive participants in cyber-physical ecosystems as opposed to being passive recipients of various top–down optimization regimes, thus paving the way to a new generation of “user-in-the-loop” cognitive systems, leveraging on domain semantics and higher-order intelligence. With the explosion of available data, cognitive systems can therefore learn, reason, and more effectively interact with each other, the users, and their surrounding environments, hence enabling higher levels of collaboration in networks of humans and systems.

Furthermore, the growing levels of hyper-connectivity among people, organizations, smart things, systems, and machines offer new perspectives on user experience, collective awareness, collective intelligence, and even collective emotions. This emerging reality challenges the way collaborative networks and systems are designed and operate with an increasing need to factor in a user-driven perspective. New forms of collaborative cognitive problem-solving can be devised, while the network’s evolutionary nature and its resilience and sustainability perspectives become the key issues. On the other hand, there is a need to better understand the potential for value creation through collaborative approaches in this context.

The 2018 IFIP Working Conference on Virtual Enterprises (PRO-VE 2018) provided a forum for sharing experiences, discussing trends, identifying challenges, and introducing innovative solutions aimed at fulfilling the vision of goal-oriented collaboration in networks of cognitive systems. Understanding, modeling, and proposing solution approaches in this area require contributions from multiple and diverse areas, including computer science, industrial and electrical engineering, social sciences, economy, organization science, and technologies, among others, which are well tuned to the interdisciplinary spirit of the PRO-VE Working Conferences.

PRO-VE 2018, held in Cardiff, UK, was the 19th event in this series of successful conferences, including:

PRO-VE 1999 (Porto, Portugal), PRO-VE 2000 (Florianopolis, Brazil), PRO-VE 2002 (Sesimbra, Portugal), PRO-VE 2003 (Lugano, Switzerland), PRO-VE 2004 (Toulouse, France), PRO-VE 2005 (Valencia, Spain), PRO-VE 2006 (Helsinki, Finland), PRO-VE 2007 (Guimarães, Portugal), PRO-VE 2008 (Poznan, Poland), PRO-VE 2009 (Thessaloniki, Greece), PRO-VE 2010 (St. Etienne, France), PRO-VE

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This proceedings book includes selected papers from the PRO-VE 2018 Conference. It provides a comprehensive overview of major challenges that are being addressed, and recent advances in various domains related to the collaborative networks and their applications. There was therefore a strong focus on the following areas related to the selected main theme for the 2018 conference:

- Blockchain in Collaborative Networks
- Industry Transformation and Innovation
- Semantics in Networks of Cognitive Systems
- Cognitive Systems for Resilience Management
- Collaborative Energy Services in Smart Cities
- Cognitive Systems in Agribusiness
- Building Information Modeling
- Industry 4.0 Support Frameworks
- Health and Social Welfare Services
- Risk, Privacy, and Security
- Collaboration Platform Issues
- Sensing, Smart, and Sustainable Enterprises
- Information Systems Integration
- Dynamic Logistics Networks
- Collaborative Business Processes
- Value Creation in Networks
- Users and Organizations Profiling
- Collaborative Business Strategies

We are thankful to all the authors, from academia, research, and industry, for their contributions. We hope this collection of papers represents a valuable tool for those interested in research advances and emerging applications in collaborative networks, as well as identifying future open challenges for research and development in this area. We very much appreciate the dedication, time, and effort spent by the members of the PRO-VE international Program Committee who supported the selection of articles for this conference and provided valuable and constructive comments to help authors with improving the quality of their papers.

July 2018

Luis M. Camarinha-Matos
Hamideh Afsarmanesh
Yacine Rezgui

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