

# Preface

Increasing availability of sensors and smart devices connected to the Internet, and powered by the pervasiveness of Cyber-Physical Systems and Internet of Things, create an exponential growth of available data. We observe the hyper-connectivity of organizations, people, and machines taking us to data-rich environments and often facing big data challenges. All activities in the world, and everyday life of people, leave trails that can be accumulated on cloud-supported storage, while developments in open data movement contribute to the wide availability of such data.

This emerging reality challenges the way collaborative networks and systems are designed and operate. Earlier approaches to collaborative networking however were constrained by scarcity of data, and thus previous solutions in terms of the organizational structures, applied algorithms and mechanisms, and governance principles and models, need to be revisited and redesigned to comply with the speed of evolving scenarios. Furthermore, new solutions need to consider a convergence of technologies, including CPS, IoT, Linked Data, Data Privacy, Federated Identity, Big Data, Data Mining, Sensing Technologies, etc., and the impact of the variables, such as time, location, and population, which suggest a stronger focus on system dynamics. The new abundance of data also raises challenges regarding data validity and quality, with the increasing need for data cleaning and avoiding the cascade of errors. Cyber-security and the impact of non-human data manipulators (bots) become particularly critical, as there is an increasing dependency on data from the society, which may lead to malicious data access and citizen safety and liberty concerns. On the other hand, there is a need to better understand the potential for value creation through collaborative approaches in this context.

PRO-VE 2017 is therefore addressing the timely topic of data-rich world. It will provide a forum for sharing experiences, discussing trends, identifying challenges, and introducing innovative solutions aimed at fulfilling the vision of collaboration in a data-rich world. Understanding, modeling and proposing solution approaches in this area require contributions from multiple and diverse areas, including computer science, industrial engineering, social sciences, organization science, and technologies, among others, which are well tuned to the interdisciplinary spirit of the PRO-VE Working Conferences.

**PRO-VE 2017**, held in Vicenza, Italy, was the 18th 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 (Poznań, Poland), PRO-VE 2009 (Thessaloniki, Greece), PRO-VE 2010 (St. Étienne, France), PRO-VE 2011 (São Paulo, Brazil), PRO-VE 2012 (Bournemouth, UK), PRO-VE 2013

(Dresden, Germany), PRO-VE 2014 (Amsterdam, The Netherlands), PRO-VE 2015 (Albi, France), and PRO-VE 2016 (Porto, Portugal).

This proceedings book includes selected papers from the PRO-VE 2017 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 is therefore a strong focus on the following areas related to the selected main theme for 2017 conference:

- Collaborative models, platforms and systems for data-rich worlds
- Manufacturing ecosystem and collaboration in Industry 4.0
- Big data analytics and intelligence
- Risk, performance, and uncertainty in collaborative data-rich systems
- Semantic data/service discovery, retrieval, and composition, in a collaborative data-rich world
- Trust and sustainability analysis in collaborative networks
- Value creation and social impact of collaboration in data-rich worlds
- Technology development platforms supporting collaborative systems
- Collective intelligence and collaboration in advanced/emerging applications:
  - Collaborative manufacturing and factories of the future, e-health and care, food and agribusiness, and crisis/disaster management.

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 & development in this area. We very much appreciate the dedication, and 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.

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