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## FOREWORD

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### Special Section on Autonomous Decentralized Systems Technologies and Approaches Innovation through Structure Change of Society and Life

The Concept of Autonomous Decentralized Systems (ADS), born in Japan 40 years ago, has technologically evolved in the fields of communication networks, information systems, and control systems. ADS technologies have been applied to many real systems, and accepted as the de-facto standard in consortiums such as the "Open Device-Net Vendors Association (ODVA)", "Object Management Group (OMG)", and Japanese "Building Automation Systems Association (BAS)". IEICE and IEEE published joint Special Sections on "Autonomous Decentralized Systems" in May 2000, Oct. 2001, Dec. 2005, Sept. 2008, Nov. 2011 and April 2016 cooperating with the IEEE International Symposium on Autonomous Decentralized Systems (ISADS). ADS technology has been making tangible improvement, and innovative new research is being reported successively. In particular, it is expected that ADS technology is applied to applications to promote transformation of social infrastructures, including the smart grid, environment management, resilience of system, Internet of Things, autonomous car and train, and mobile communications.

With the advancement of science and technology, the trend of social and economic development was transformed from high-speed growth in competitive environment to sustainable development under global cooperation. The development of society and economy reduces the gap in material aspect of life among countries. As a result, the value system regarding life style is transformed from homogeneous to heterogeneous. Society, economy and life have been unpredictably changing and evolving under globalization, while sustainability is receiving more weight in addition to growth. Technology and business are interwoven in the real world, and consistency between research and development is crucial for sustainability in manufacturing, operation, maintenance, service and finance in the life-cycle of a system. The ADS concept, technologies and applications have been highly valued and expected to contribute to the structure change of society and life.

The objective of this Special Section is to discuss new technologies in the field of Autonomous Decentralized Systems from both technology and application deployments point of view through papers. The Special Section solicited paper submissions not only from people who presented new technologies in the International Symposium on Autonomous Decentralized System (ISADS 2017) in March 2017 but also from people who are interested in this field. Due to the fact that ADS has wide-variety of applications across multiple fields, this special section had been planned by coordinating the IEICE Communications Society and the committee members of ISADS 2017.

There are 3 invited papers and 2 regular papers selected by the editorial committee. The editorial committee hopes that these sophisticated papers will make great contribution to the ADS related technologies and their applications.

As the Guest Editor-in-Chief, I would like to express my sincere appreciation to all the authors for their contribution, and to all the Editorial Committee members for their devoted review works.

#### Editorial Committee Members

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Hidenori Nakazato, Guest Editor-in-Chief

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**Hidenori Nakazato** (*Fellow*) received his B.E. degree in Electronics and Telecommunications from Waseda University in 1982 and his M.S. and Ph.D. degrees in Computer Science from the University of Illinois in 1989 and 1993, respectively. He was affiliated with Oki Electric from 1982 to 2000 where he developed equipment for public telephone switches, distributed environments for telecommunications systems, and communications quality control mechanisms. He is a professor at the Department of Communications and Computer Engineering, Waseda University, Japan. His research interests include information centric networking, cooperation mechanisms of distributed programs, and network QoS control.

