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Volume 159

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Tomoya Enokido · Hsing-Chung Chen ·
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# Advances on Broad-Band Wireless Computing, Communication and Applications

Proceedings of the 15th International Conference on Broad-Band and Wireless Computing, Communication and Applications (BWCCA-2020)

Springer

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# Welcome Message of BWCCA-2020 International Conference Organizers

Welcome to the 15th International Conference on Broadband and Wireless Computing, Communication and Applications (BWCCA-2020), which will be held in conjunction with the 15th 3PGCIC-2020 International Conference from October 28 to October 30, 2020 in Yonago City, Tottori Prefecture, Japan.

This International Conference is a forum for sharing ideas and research work in the emerging areas of broadband and wireless computing. Information networks of today are going through a rapid evolution. Different kinds of networks with different characteristics are emerging and they are integrating in heterogeneous networks. For these reasons, there are many interconnection problems which may occur at different levels of the hardware and software design of communicating entities and communication networks. These kinds of networks need to manage an increasing usage demand, provide support for a significant number of services, guarantee their QoS, and optimize the network resources.

The success of all-IP networking and wireless technology has changed the ways of living the people around the world. The progress of electronic integration and wireless communications is going to pave the way to offer people the access to the wireless networks on the fly, based on which all electronic devices will be able to exchange the information with each other in ubiquitous way whenever necessary.

The aim of this conference is to present the innovative research and technologies as well as developments related to broadband networking, and mobile and wireless communications.

The organization of an International Conference requires the support and help of many people. A lot of people have helped and worked hard to produce a successful BWCCA-2020 technical program and conference proceedings. First, we would like to thank all authors for submitting their papers, program committee members and reviewers who carried out the most difficult work by carefully evaluating the submitted papers.

We thank Web Administrators Co-Chairs and Finance Chair for their excellent work. We would like to express our gratitude to Prof. Makoto Takizawa, Hosei University, Japan, as Honorary Chair of BWCCA-2020 for his support and

help. We give special thanks to Keynote Speakers of BWCCA-2020 and local arrangement team.

We hope you will enjoy the conference and have a great time in Yonago City, Japan.

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# BWCCA-2020 Keynote Talks

# Fairness and Efficiency in Network Resource Sharing

Masato Tsuru

Kyushu Institute of Technology, Japan

**Abstract.** With the expansion of network users and applications, the network traffic is still growing and a better sharing of limited network resources among multiple users/applications is required. In particular, recent strong demand on Internet of things (IoT) for smart and connected communities along with architectural advancement, such as software-defined networking (SDN) and multiaccess edge computing (MEC), has posed new challenges in fair and efficient resource sharing by multiplexing with complex and heterogeneous settings. In this talk, after briefly reviewing recent trends in communication networks, we discuss the concept of fairness in terms of achieved performance of each user through simple examples in wireless and wired networks. Then, we go into more details in few examples (Multipath-multicast file transfer on OpenFlow network; Wireless shared channel scheduling) and see how a fair and efficient resource sharing can be realized by time-division, space-division and information-coding multiplexing.

# Road Status Sensing and V2X Technologies toward Autonomous Driving on Challenged Network Environment

Yoshitaka Shibata

Iwate Prefectural University, Morioka, Japan

**Abstract.** Autonomous driving systems are expected as future safe and effective vehicles and have been investigated and developed in industrial countries and actually driving on the exclusive and highway roads with flat surface, clear driving lanes and center lines separated from the opposite direction and on good weather conditions. In the future autonomous driving systems, more general road status and weather status environments such as heavy snow countries in addition to challenged network environment where no public communication network is available must be considered to realize safer and reliable mobility infrastructure. In this talk, in order to resolve the above problems, IoT-based crowd sensing technology using various environmental sensors to precisely identify qualitative and quantitative road status using AI technology is discussed. The next-generation V2X communication technology to exchange and share those road status and GIS information among surrounding vehicles and roadside bases stations is also explained. Finally, a wide road status information sharing platform for challenged weather and network environments based on the 5G and the next-generation high speed LAN is introduced.

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