# IEICE General Conference 2019 Symposium

A: Engineering Sciences Society   <mark>Click here to see ditails.</mark>

   ANS-1．Analysis and applications of networked systems through a variety of approaches

N: NOLTA Society   <mark>Click here to see ditails.</mark>

   ANS-1．Analysis and applications of networked systems through a variety of approaches

B: Communications Society   <mark>Click here to see ditails.</mark>

   BS-1．Radio Propagation Modeling Competition

   BS-2．Measurement Techniques to Extract Aimed Signals/Phenomena in EMC

   BS-3．Network technologies of high reliability, low delay, autonomous control to realize new industrial systems

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   CS-1．Information storage technology and its future trends in AI/IoT era

   CS-2．From foundation to application of artificial intelligence, optimization, and automatic design technology

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   CS-1．COMP Student Symposium

# A: Engineering Sciences Society / N: NOLTA Society

### ANS-1. Analysis and applications of networked systems through a variety of approaches

With the advent of the era of IoT and big data, the importance of the studies on analysis, control, design and optimization of networked systems and those on distributed computation over networks is increasing. This symposium session calls for contributions on those topics through a variety of approaches including circuits and systems theory, nonlinear theory, graph theory, control theory, signal processing, and algorithms. Through presentations and discussions of recent advances, this session provides researchers and students from different fields a forum for understanding the current status and the future trends of the studies of networked systems.

# B: Communications Society

### BS-1. Radio Propagation Modeling Competition

In next generation mobile communication such as IoT and Connected car, in order to high speed and high quality transmission, understanding of complicated radio propagation characteristics is needed, its accurate modeling is very important for practical application. Therefore, radio propagation researchers are required to further improve modeling skills of propagation characteristics. Taking these in to consideration, we propose the competition on "radio propagation modeling based on common measurement data" as a symposium session. Specifically, at the website of Technical Committee on Antennas and Propagation, we will show the contents of this project and widely invite participation. In this session, participants present the research results. Note that an excellent presentation will be awarded.

### BS-2. Measurement Techniques to Extract Aimed Signals/Phenomena in EMC

Measurements for solving EMC problems tend to be applied to the actual electronics equipments or systems. Dealing with such complex systems, we need to extrude and emphasize the aimed signals or phenomena. For that purpose, some investigations can be seen such as development of new probes, measurement technique that modulates the measurement target, measurement that utilizes spatial orthogonality such as spherical harmonic functions, signal extraction technique that utilizes code orthogonality, noise feature extraction by the use of cepstrum, etc. These measurement techniques extend the measurement limitation. This session is proposed to overview these measurement techniques.

### BS-3. Network technologies of high reliability, low delay, autonomous control to realize new industrial systems

Along with the development of IoT technology, not only service systems, but also industrial systems and transportation systems to solve various problems are required. For example, for automatic control of cars and drone, highly reliable communication is required with a delay of milliseconds or microseconds. Also, network administrators are usually absent in the system, and it is necessary to autonomously construct and update networks such as sensor networks and manufacturing automation.

In this session, we will present presentations and discussions on the latest technologies and applications such as high reliability, high performance, autonomous control, etc. that realize the network for a new industrial system. We also welcome the presentations from industry and academic community on the prototypes such as IoT system and case examples of industry-university collaboration.

### BS-4. Compositive Information Communication Technologies and Applications for Future Network Systems

Development of next generation information communication technologies such as 5G mobile networks and edge computing technologies, and widespread use of new technologies such as LPWA realize various use cases beyond traditional communication models. Especially, the innovations expand the application areas represented by IoT due to the diversification of the connected devices as well as the communication models. The expansion and diversification require compositive and panoramic investigation of various technologies in addition to each of the technologies. This symposium discusses compositive information communication technologies and applications having social impacts in the near future through the research presentations.

### BS-5. Special Poster Session ~ Network Technology ~

This session handles themes on Network Technology. The presentation style is poster session so that people in the room including speakers could hold an active and fruitful discussion anytime during the session and could have feedback or tips for his or her own study. As the session aims to have a discussion about research topics in progress, 1 written paper would be sufficient.

### BS-6. Energy storage, conversion, transmission and utilization technologies for the upcoming society with Internet of Things paradigm

Higher performance, efficiency, and various functions have been required for power sources in an upcoming society with Internet of Things (IoT) technologies. Besides, widespread use of renewable energy has also been required from environmental regulations, which have recently tightened worldwide. Therefore, including diversification of energy sources, overviewing and

discussing the energy storage, conversion, transmission and utilization technologies to achieve stable power supply for the upcoming IoT society are of particular interest. We sincerely propose an above mentioned topic as a symposium theme in the next general conference of the Institute of Electronics, Information and Communication Engineers.

## BS-7．Poster Session for Young Researchers - Internet

From 2016, technical committee on internet architecture (TCIA) regularly provides a poster session for young researchers in General Conference in each year. Young researchers including students are encouraged to submit one or two page manuscripts for the poster session. The poster presenters must bring their posters in the session. English or Japanese language is allowed to use in the manuscript and poster. TCIA will select excellent poster awards.

# C: Electronics Society

## CS-1. Information storage technology and its future trends in AI/IoT era

Magnetic Recording and Information Storage (MRIS) of IEICE Technical Committee have passed 54 years. The volume of digital information is recently growing according to the global spread of digital equipment, IoT device, the development of the cloud technology and the AI technology. Accordingly, the demand about information storage technology has various things to not only areal density but access speed, reliability, consumption of electricity and so on. For this reason, the research of magnetic recording technology, optical recording technology, and the other memory technology which based on the information storage technology has been carried out actively.

On this symposium, current update of magnetic recording technology, optical recording technology, the solid-state memory and the molecular memory and its component technologies will be discussed.

## CS-2. From foundation to application of artificial intelligence, optimization, and automatic design technology

With the progress of computer architecture and communication network, artificial intelligence and optimal design technology are giving great influence on our society. Also in the field of electronics, these technologies utilizing computer simulation technique will bring a major change in product development in a wide range of application.

These technologies make it possible which has been difficult so far, such as recognition of invisible objects and automatic optimal design of electronic devices. In this symposium, we will discuss the focused issues related to the state of the art and the future prospects on artificial intelligence and automatic design optimization technology for electronics.

# D: Information and Systems Society

## DS-1. COMP Student Symposium

In the field of theoretical computer science, wide spread view over various topics is necessary for outstanding researches, and only those with such view can develop the research frontier. Therefore, academic exchange among students with different research themes is effective for supporting the growth of high-level researchers.

The purpose of this symposium is to provide opportunities for their research communication. The presenters are required to be students, while the other coauthors may be regular members.