External Awards

ITU-AJ Encouragement Award
Winner: Kei Harada, NTT Network Innovation Laboratories
Date: May 17, 2018
Organization: The ITU Association of Japan (ITU-AJ)

For her more than one year of involvement in oneM2M standardization efforts and related dissemination activities.

Best Magazine Paper Award
Winner: Nahoko Kasai, Takayuki Ogasawara, Hiroshi Nakashima, and Shingo Tsukada, NTT Basic Research Laboratories
Date: May 18, 2018
Organization: The Institute of Electronics, Information and Communication Engineers (IEICE)

For "Development of Functional Textile "hitoe": Wearable Electrodes for Monitoring Human Vital Signals."

A journal article award was given by IEICE to the authors of this paper describing the development history of the functional material "hitoe" and its application examples such as sports monitoring, heart rate/posture/breathing estimation, and worker safety management.
Published as: N. Kasai, T. Ogasawara, H. Nakashima, and S. Tsukada, "Development of Functional Textile "hitoe": Wearable Electrodes for Monitoring Human Vital Signals," IEICE Communications Society Magazine, Vol. 41, pp. 17–23, 2017 (in Japanese).

CHEMINAS Technology Award
Winner: Suzuyo Inoue, Yuzuru Iwasaki, Katsuyoshi Hayashi, and Michiko Seyama, NTT Device Technology Laboratories; Tsutomu Horiuchi, Institute of Technologists
Date: May 21, 2018
Organization: Society for Chemistry and Micro-Nano Systems (CHEMINAS)

For development of a portable surface plasmon resonance sensor and its combination with a microfluidic device for a new biosensing technology.

Contribution Award for Standardization
Winner: Toshimori Honjo, NTT Basic Research Laboratories
Date: May 28, 2018
Organization: Information Technology Standards Commission of Japan (ITSCJ)

For his contribution to standardization activities in ITSCJ, an organization of the Japanese Industrial Standards Committee that is participating in standardization activities corresponding to ISO/IEC (International Organization for Standardization/International Electrotechnical Commission) Joint Technical Committee 1.

ISCS Quantum Devices Award
Winner: Hiroshi Yamaguchi, NTT Basic Research Laboratories
Date: May 29, 2018
Organization: The International Symposium on Compound Semiconductors (ISCS)

For his leading contributions to the development of compound semiconductor opto/electromechanical systems.

The 42nd Laser Society of Japan Encouragement Award
Winner: Hiroki Mashiko, NTT Basic Research Laboratories
Date: May 31, 2018
Organization: The Laser Society of Japan

For research on petahertz electron manipulation with wide-bandgap semiconductors.

We successfully observed electron oscillation with petahertz frequency using semiconductor and insulator solid-state materials characterized by attosecond light source.

Best Paper Award
Winner: Masahiro Kohjima and Tatsushi Matsubayashi, NTT Service Evolution Laboratories; Hiroshi Sawada, NTT Communication Science Laboratories
Date: June 7, 2018
Organization: IEICE

For "Probabilistic Models Based on Non-negative Matrix Factorization for Inconsistent Resolution Dataset Analysis."
Published as: M. Kohjima, T. Matsubayashi, and H. Sawada, "Probabilistic Models Based on Non-negative Matrix Factorization for Inconsistent Resolution Dataset Analysis," IEICE Trans. Inf. & Syst. (Japanese Edition), Vol. J100-D, No. 4, pp. 520–529.

Achievement Award
Winner: Hiroyuki Oto and Yasuyuki Uchiyama, NTT DOCOMO; Kazuaki Obana, NTT Network Innovation Laboratories
Date: June 7, 2018
Organization: IEICE

For commercial deployment of network functions virtualization technology enabling multi-vendor EPC (evolved packet core) software.

Achievement Award
Winner: Tadao Ishibashi, NTT Electronics Techno Corporation; Fumito Nakajima, NTT Device Technology Laboratories; Yoshifumi Muramoto, NTT Device Innovation Center
Date: June 7, 2018
Organization: IEICE

For their pioneering work on ultrahigh-speed, high-output-power, and high-sensitivity photodiodes.

Papers Published in Technical Journals and Conference Proceedings

Local Linear Predictive Coding for High Resolution Time-frequency Analysis

F. Ishiyama

Proc. of 2017 IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2017), pp. 1–6, Bilbao, Spain, December 2017.

We are developing a method of time-frequency analysis on the basis of linear predictive coding (LPC). In contrast to standard LPC, which assumes an infinite number of samples, our method obtains instantaneous frequencies, instantaneous amplitude vary rates, and instantaneous amplitudes from a small number of samples. The time width for single local analysis can be much narrower than the period of oscillation of a given time series, enabling high resolution time-frequency analysis. We outline our method and use it to analyze electro-magnetic noise in comparison with short time Fourier transform to show its resolution.

Electrical and Kinesthetic Stimulation for Virtual Walking Sensation

H. Kaneko, R. Koide, Y. Ikei, T. Amemiya, K. Hirota, and M. Kitazaki

IEEE Haptics Symposium 2018, San Francisco, USA, March 2018.

The effect of electrical stimulation applied to the lower limb tendons on the sensation of virtual walking was investigated. The virtual walking, here, is a passive experience in which the user sees and acts virtually as some other person did to learn through his/her experience. A display device was developed to provide electrical stimulation to sensory nerves in the Achilles tendon and the tibialis anterior tendon. A kinesthetic stimulus and visual stimulus were simultaneously provided to a seated participant. We measured the sensations of walking and translational motion regarding three factors of electrical, kinesthetic and visual stimuli. The result obtained from eleven participants revealed that the three factors were significant in enhancing the sensation of virtual walking. The electrical stimulation for proprioception seemed effective to compensate the characteristics of passive kinesthetic playback of experiences.

Interactive Proofs with Polynomial-time Quantum Prover for Computing the Order of Solvable Groups

F. Le Gall, T. Morimae, H. Nishimura, and Y. Takeuchi

arXiv: 1805.03385 [quant-ph], May 2018.

In this paper we consider what can be computed by a user interacting with a potentially malicious server, when the server performs polynomial-time quantum computation but the user can only perform polynomial-time classical (i.e., non-quantum) computation. Understanding the computational power of this model, which corresponds to polynomial-time quantum computation that can be efficiently verified classically, is a well-known open problem in quantum computing. Our result shows that computing the order of a solvable group, which is one of the most general problems for which quantum computing exhibits an exponential speed-up with respect to classical computing, can be realized in this model.
