External Awards

2014 LOIS Young Researcher Award
Winner: Rika Mochizuki, NTT Service Evolution Laboratories
Date: May 14, 2015
Organization: Institute of Electronics, Information and Communication Engineers (IEICE) Information and Systems Society, Technical Committee on Life Intelligence and Office Information Systems (LOIS)

For "Impression Extraction for Comparison Services of the Restaurant."
Published as: R. Mochizuki, T. Watanabe, K. Tanaka, and T. Yamada, "Impression Extraction for Comparison Services of the Restaurant," IEICE Tech. Rep., Vol. 113, No. 381, LOIS2013-49, pp. 59–64, Jan. 2014.

2014 LOIS Research Award
Winner: Yoshiaki Seki, Naoko Chiba, NTT Secure Platform Laboratories; and Yoshiaki Hashimoto, The University of Tokyo
Date: May 14, 2015
Organization: IEICE Information and Systems Society, LOIS

For "Risk Assessment of Information Leak in Twitter Use of Employee."
Published as: Y. Seki, N. Chiba, and Y. Hashimoto, "Risk Assessment of Information Leak in Twitter Use of Employee," IEICE Tech. Rep., Vol. 113, No. 479, LOIS2013-75, pp. 125–130, Mar. 2014.

IPSJ Activity Contribution Award
Winner: Mitsuaki Akiyama, NTT Secure Platform Laboratories
Date: June 3, 2015
Organization: Information Processing Society of Japan (IPSJ)

For his contribution to the establishment and development of a community of researchers and implementers in the information security field.

2014 ICSS Research Award
Winner: Yuta Ishii, Takuya Watanabe, Waseda University; Mitsuaki Akiyama, NTT Secure Platform Laboratories; and Tatsuya Mori, Waseda University
Date: June 11, 2015
Organization: IEICE Technical Committee on Information and Communication System Security (ICSS)

For "Understanding Android Apps that Are Similar to Legitimate Ones."
Published as: Y. Ishii, T. Watanabe, M. Akiyama, and T. Mori, "Understanding Android Apps that Are Similar to Legitimate Ones," IEICE Tech. Rep., Vol. 114, No. 489, ICSS2014-94, pp. 187–192, Mar. 2015.

MVE Award
Winner: Keita Suzuki, The University of Tokyo; Masanori Yokoyama, NTT Service Evolution Laboratories; Yuki Kinoshita, The University of Tokyo; Takayoshi Mochizuki, Tomohiro Yamada, NTT Service Evolution Laboratories; Sho Sakurai, Takuji Narumi, Tomohiro Tanikawa, and Michitaka Hirose, The University of Tokyo
Date: July 2, 2015
Organization: IEICE Technical Committee on Multimedia and Virtual Environment (MVE)

For "Method of Enhancing Effect of Social Touch in Remote Communication between Males by Changing Impression of Gender."
Published as: K. Suzuki, M. Yokoyama, Y. Kinoshita, T. Mochizuki, T. Yamada, S. Sakurai, T. Narumi, T. Tanikawa, and M. Hirose, "Method of Enhancing Effect of Social Touch in Remote Communication between Males by Changing Impression of Gender," IEICE Tech. Rep., Vol. 115, No. 125, MVE2015-9, pp. 7–12, July 2015.

DICOMO 2015 Presentation Award
Winner: Keisuke Tsunoda, NTT Service Evolution Laboratories
Date: July 10, 2015
Organization: Executive Committee of IPSJ DICOMO (Multimedia, Distributed, Cooperative, and Mobile) 2015 Symposium

For "Estimation of Cognitive Performance Change Using Heart Rate Variability."
Published as: K. Tsunoda, A. Chiba, H. Chigira, T. Ura, O. Mizuno, and T. Tanaka, "Estimation of Cognitive Performance Change Using Heart Rate Variability," Proc. of DICOMO 2015, 8D-1, pp. 1694–1702, Tokyo, Japan, July 2015 (in Japanese).

DICOMO 2015 Best Paper Award
Winner: Keisuke Tsunoda, Akihiro Chiba, Hiroshi Chigira, Tetsuya Ura, Osamu Mizuno, and Tomohiro Tanaka, NTT Service Evolution Laboratories
Date: August 24, 2015
Organization: Executive Committee of IPSJ DICOMO (Multimedia, Distributed, Cooperative, and Mobile) 2015 Symposium

For "Estimation of Cognitive Performance Change Using Heart Rate Variability."
Published as: K. Tsunoda, A. Chiba, H. Chigira, T. Ura, O. Mizuno, and T. Tanaka, "Estimation of Cognitive Performance Change Using Heart Rate Variability," Proc. of DICOMO 2015, 8D-1, pp. 1694–1702, Tokyo, Japan, July 2015 (in Japanese).

CRYPTO2015 Best Paper Award/Best Young Researcher Award
Winner: Yousuke Todo, NTT Secure Platform Laboratories
Date: August 18, 2015
Organization: International Association for Cryptologic Research

For "Integral Cryptanalysis on Full MISTY1."
Published as: Y. Todo, "Integral Cryptanalysis on Full MISTY1," Proc. of CRYPTO 2015 (the 35th International Cryptology Conference), Santa Barbara, CA, USA, Aug. 2015.

Editor's Choice Blue Ribbon at World Maker Faire 2015
Winner: Motohiro Makiguchi, NTT Service Evolution Laboratories
Date: September 28, 2015
Organization: Maker Media, Inc.

For "Compact Virtual Theater—Kirari! For Mobile—."
I demonstrated a device that makes it possible to watch an aerial image that is available when using the Kirari! technique on smartphones.
Published as: M. Makiguchi, "Compact Virtual Theater—Kirari! For Mobile—," World Maker Faire New York 2015, New York, USA, Sept. 2015.

MWS 2015 Best Student Paper Award
Winner: Yuta Ishii, Takuya Watanabe, Waseda University; Mitsuaki Akiyama, NTT Secure Platform Laboratories; and Tatsuya Mori, Waseda University
Date: October 22, 2015
Organization: MWS (Anti Malware Engineering Workshop) 2015 Executive Committee, IPSJ Special Interest Group on Computer Security

For "A Large-scale Analysis of Cloned Android Apps."
Published as: Y. Ishii, T. Watanabe, M. Akiyama, and T. Mori, "A Large-scale Analysis of Cloned Android Apps," Proc. of MWS 2015, Nagasaki, Japan, Oct. 2015.

PWS 2015 Excellent Paper
Winner: Takuya Watanabe, Waseda University; Mitsuaki Akiyama, NTT Secure Platform Laboratories; and Tatsuya Mori, Waseda University
Date: October 22, 2015
Organization: PWS (Privacy Workshop) 2015 Executive Committee, IPSJ Special Interest Group on Computer Security

For "RouteDetector: Tracking Your Location with 9-Axis Sensors."
Published as: T. Watanabe, M. Akiyama, and T. Mori, "RouteDetector: Tracking Your Location with 9-Axis Sensors," Proc. of PWS 2015, Nagasaki, Japan, Oct. 2015.

2016 OSA Fellow Member
Winner: Masahito Tomizawa, NTT Network Innovation Laboratories
Date: October 20, 2015
Organization: Optical Society of America (OSA)

For his significant contribution to the advancement of optics and photonics.

69th Mainichi Publishing Culture Award in Natural Science Category
Winner: Junji Watanabe, NTT Communication Science Laboratories
Date: November 3, 2015
Organization: The Mainichi Newspapers

For "Somatic Intelligence for Generating Information."
Published as: J. Watanabe, "Somatic Intelligence for Generating Information," Kagaku-Dojin Publishing Co., Inc., Kyoto, 2014 (in Japanese).

TMF Most Significant Contribution to Frameworx
Winner: Shingo Horiuchi, NTT Access Service Systems Laboratories, and Takayuki Nakamura, NTT Comware
Date: November 4, 2015
Organization: TM Forum

For "Maximizing Profitability with NFV Orchestration."

IEEE SPS Japan Chapter Student Conference Paper Award
Winner: Daichi Kitamura, The Graduate University for Advanced Studies (SOKENDAI); Nobutaka Ono, National Institute of Informatics; Hiroshi Sawada, NTT Service Evolution Laboratories; Hirokazu Kameoka, NTT Communication Science Laboratories; and Hiroshi Saruwatari, The University of Tokyo

Date: November 5, 2015
Organization: IEEE (Institute of Electrical and Electronics Engineers) Signal Processing Society (SPS) Japan Chapter

For "Efficient Multichannel Nonnegative Matrix Factorization Exploiting Rank-1 Spatial Model."
Published as: D. Kitamura, N. Ono, H. Sawada, H. Kameoka, and H. Saruwatari, "Efficient Multichannel Nonnegative Matrix Factorization Exploiting Rank-1 Spatial Model," Proc. of the IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2015, pp. 276–280, Brisbane, Australia, May 2015.

MNC 2014 Most Impressive Presentation
Winner: Daiki Hatanaka, Imran Mahboob, Koji Onomitsu, and Hiroshi Yamaguchi, NTT Basic Research Laboratories
Date: November 11, 2015
Organization: MNC 2014 (27th International Microprocesses and Nanotechnology Conference) Organizing Committee

For "All-Mechanical Bistable Memory in a Phonon Waveguide."
Published as: D. Hatanaka, I. Mahboob, K. Onomitsu, and H. Yamaguchi, "All-Mechanical Bistable Memory in a Phonon Waveguide," Proc. of MNC 2014, 5D-2-3, Fukuoka, Japan, Nov. 2014.

MNC 2014 Most Impressive Poster
Winner: Kenji Yamazaki and Hiroshi Yamaguchi, NTT Basic Research Laboratories
Date: November 11, 2015
Organization: MNC 2014 Organizing Committee

For "Renovation of Three-dimensional Electron Beam Lithography System for Improvement of Positioning Accuracy and Reduction of Turnaround Time."
Published as: K. Yamazaki and H. Yamaguchi, "Renovation of Three-dimensional Electron Beam Lithography System for Improvement of Positioning Accuracy and Reduction of Turnaround Time," Proc. of MNC 2014, 6P-7-6, Fukuoka, Japan, Nov. 2014.

Certificate of Recognition
Winner: Nei Kato, Hiroki Nishiyama, Katsuya Suto, Daiki Murayama, Hideki Kuribayashi, Graduate School of Information Sciences, Tohoku University; Yoshitaka Shimizu, Yasuo Suzuki, NTT Network Innovation Laboratories
Date: November 19, 2015
Organization: Municipality of San Remigio, Cebu, Philippines

For recognition of their tireless dedication and their willingness to share and support the disaster-resilient network experiments.

GN Workshop 2015 Best Paper Award
Winner: Keisuke Tsunoda, Akihiro Chiba, Hiroshi Chigira, Kazuhiro Yoshida, and Osamu Mizuno, NTT Service Evolution Laboratories
Date: November 28, 2015
Organization: IPSJ Special Interest Group on Groupware and Network Services (GN)

For "Online Estimation Method of a Cognitive Performance Using Heart Rate Variability."
Published as: K. Tsunoda, A. Chiba, H. Chigira, K. Yoshida, and O. Mizuno, "Online Estimation Method of a Cognitive Performance Using Heart Rate Variability," Proc. of GN Workshop 2015, pp. 1–10, Tokyo, Japan, July 2015 (in Japanese).

SSS'14 Young Author Prize

Winner: Masaya Murata, NTT Communication Science Laboratories

Date: December 5, 2015

Organization: The Institute of Systems, Control and Information Engineers (ISCIE)

For "Gaussian Unscented Filter."

Published as: M. Murata, H. Nagano, and K. Kashino, "Gaussian Unscented Filter," Proc. of SSS'14 (the 46th ISCIE International Symposium on Stochastic Systems Theory and Its Applications), Kyoto, Japan, Nov. 2014.

HCG Research Award

Winner: Reiko Aruga, Shin-ichiro Eitoku, Tae Sato, Toru Sadakata, and Tomohiro Tanaka, NTT Service Evolution Laboratories

Date: December 5, 2015

Organization: IEICE Human Communication Group (HCG) Special Interest Group on Human Communication Science (HCS)

For "Fundamental Study on Interactive Labeling Method Based on Retrieval Property."

Published as: R. Aruga, S. Eitoku, T. Sato, T. Sadakata, and T. Tanaka, "Fundamental Study on Interactive Labeling Method Based on Retrieval Property," IEICE Tech. Rep., Vol. 114, No. 440, HCS2014-99, pp. 149–154, Jan. 2015.

Papers Published in Technical Journals and Conference Proceedings

Magnetooptical and Crystalline Properties of Sputtered Garnet Ferrite Film Using a Stress Relaxation Buffer Layer

A. Furuya, A. Sasaki, H. Morimura, O. Kagami, and T. Tanabe

Japanese Journal of Applied Physics, Vol. 54, p. 09MF02, September 2015.

The purpose of this study was to improve the optical characteristics of garnet ferrite films sputter-deposited on a glass substrate. The magnetooptical properties of the garnet ferrite film are strongly influenced by the thermal stress imposed on the substrate during crystallization. The condition of the interface between the garnet film and the substrate during the initial film deposition affects the magnetooptical characteristics of the entire film. In particular, we revealed the effect of stress generated at the interface on the crystallinity of the deposited garnet films with a stress relaxation buffer layer by observing the film cross section and the film surface. In addition, we qualitatively estimated the effect of cracking in the garnet film on a glass substrate.

Development of High-efficiency Downsized Power Conversion (380 V to –48 V) Equipment for HVDC Power Supply System

N. Hanaoka, A. Takahashi, T. Tanaka, N. Yamashita, and M. Sugahara

Proc. of the 37th International Telecommunications Energy Conference (INTELEC 2015), pp. 12–17, Osaka, Japan, October 2015.

This paper proposes and describes the performance of high-efficiency downsized power conversion equipment for high-voltage direct-current (HVDC) use. The equipment is small enough to mount in the dead space of a rack. Configuring 380 V/–48 V conversion equipment with existing technology lowers the efficiency of the entire power supply system and increases the installation area. To solve these problems, it has become necessary to develop equipment with an efficiency of 97% or greater and with dimensions small enough for mounting in the dead space of a rack. To this end, we have achieved high efficiency and small size by adopting a circuit configuration that uses a compact, high-efficiency chip converter as used on motherboards in ICT equipment and that disconnects the voltage step-up circuit during normal operation.

Concept of New Power Supply System Topology Using 380 V and 48 V DC Bus for Future Datacenters and Telecommunication Buildings

T. Tanaka, N. Hanaoka, A. Takahashi, K. Asakimori, T. Iwato, A. Sakurai, and N. Yamashita

Proc. of INTELEC 2015, pp. 114–119, Osaka, Japan, October 2015.

A new power supply topology is proposed for using various types of power supply systems together in datacenters and telecom buildings. In this topology, the power supply chain from the building power receiving point to the IC chips in the ICT equipment is organized into blocks to simplify the number of DC bus conversion steps. Two types of voltage for the DC bus are proposed: 380 V and 48 V. This topology is expected to enable the design of power supply systems that are highly efficient, highly reliable, and less expensive and that can be flexibly applied in buildings that are large or small according to reliability requirements.

Subcarrier Restoration for Survivable Multi-flow Transponders in Elastic Optical Networks

T. Tanaka, T. Inui, W. Imajuku, and A. Hirano

Proc. of the 21st Asia-Pacific Conference on Communications (APCC 2015), Kyoto, Japan, October 2015.

We discuss survivability considerations for multicarrier-based elastic optical networks, focusing on the multicarrier transponder (MCT). We explain the necessity of subcarrier restoration that can recover multicarrier connections using backup sub-channels. An initial evaluation shows our restoration scheme improves transponder reliability.

Proposal of a Simple CD ROADM with Contention-free Add/Drop Function

A. Iwaki, A. Sahara, and M. Fukutoku

Proc. of APCC 2015, Kyoto, Japan, October 2015.

We propose a simple configuration for colorless and directionless (CD) reconfigurable optical add/drop multiplexers that enables contention-free add/drop operation to be achieved. In the configuration, we apply a combination of multiple small-port-count CD add/drop banks (CD banks) and round-robin CD bank assignment. Evaluation results show that the proposed configuration can substantially reduce intra-node contention.

Discovering and Describing Image Contexts from Socially Curated Contents

A. Kimura, K. Ishiguro, A. M. Alvarez, M. Yamada, K. Kataoka, and K. Murasaki

IPSJ Transactions on Mathematical Modeling and Its Applications (TOM), Vol. 8, No. 3, pp. 10–25, November 2015 (in Japanese).

This paper proposes a novel method for discovering a set of image *contents* sharing a specific *context* with the help of image collections obtained from content curation platforms. Socially curated contents are promising to analyze various kinds of multimedia information, since they are manually filtered and organized based on specific individual preferences, interests, or perspectives. Our method fully exploits the process of social curation: how images are manually grouped together by users, and how images are distributed in the platform. Our method reveals that images with a specific context are naturally grouped together and every image includes really various contexts that cannot necessarily be verbalized by texts. In addition, we show how the image contexts obtained from socially curated contents can be used for several tasks such as image classification, data visualization, and image retrieval. The key idea is to incorporate the contexts as side information to derive an embedding transformation so that images with similar contexts are close in the embedding space. Through experiments with images obtained from Pinterest, we show that our proposed method benefits several image-related tasks such as visualization, image classification, and image retrieval.

Ultralow Bias Power All-optical Photonic Crystal Memory Realized with Systematically Tuned L3 Nanocavity

E. Kuramochi, K. Nozaki, A. Shinya, H. Taniyama, K. Takeda, T. Sato, S. Matsuo, and M. Notomi

Applied Physics Letters, Vol. 107, No. 22, p. 221101, November 2015.

An InP photonic crystal nanocavity with an embedded InGaAsP active region is a unique technology that has realized an all-optical memory with a sub-micro-watt operating power and limitless storage time. In this study, we employed an L3 design with systematic multi-hole tuning, which realized a higher loaded Q factor ($> 40,000$) and a lower mode volume (0.9 μm^3) than a line-defect-based buried-heterostructure nanocavity ($16,000$ and 2.2 μm^3). Excluding the active region realized a record loaded Q factor ($210,000$) in all for InP-based nanocavities. The minimum bias power for bistable memory operation was reduced to 2.3 ± 0.3 nW, which is about 1/10 that of the previous record of 30 nW. This work further established the capability of a bistable nanocavity memory for use in future ultralow-power-consumption on-chip integrated photonics.

Emphasized Accent Phrase Prediction from Advertisement Text for Text-To-Expressive Speech Synthesis

H. Nakajima, H. Mizuno, and S. Sakauchi

IPSJ Journal, Vol. 56, No. 12, pp. 2384–2394, December 2015 (in Japanese).

Realizing expressive text-to-speech synthesis requires development of both text processing and rendering of natural expressive speech. This paper focuses on the former as a front-end task in the production of synthetic speech and investigates a novel method for predicting emphasized accent phrases from advertisement text information. For this purpose, we examine features that can be accurately extracted by text processing based on current text-to-speech synthesis technologies. Among features, the word surface string of the main content and function words and the part-of-speech of main function words in an accent phrase are found to have higher potential on predicting whether the accent phrase should be emphasized or not through the calculation of mutual information between emphasis label and features of Japanese advertisement sentences. Experiments confirm that emphasized accent phrase prediction using support vector machine (SVM) offers encouraging accuracies for the system which requires emphasized accent phrase locations as context information to improve speech synthesis qualities.

Coherent Raman Beat Analysis of the Hyperfine Sublevel Coherence Properties of $^{167}Er^{3+}$ Ions Doped in an Y_2SiO_5 Crystal

D. Hashimoto and K. Shimizu

Journal of Luminescence, Vol. 171, No. 3, pp. 183–190, December 2015.

In this paper, we describe the use of coherent Raman beat (CRB) spectroscopy designed to reveal the phase coherence time t_2 of the ground state hyperfine sublevels of $^{167}Er^{3+}$ ions doped in an Y_2SiO_5 crystal cooled to a cryogenic temperature. The short optical coherence time T_2 (~ 1 μs) and sublevel population lifetime t_1 (~ 0.1 s) of the dopant Er^{3+} ions make it difficult to implement Raman echoes and optically detected spin echoes for measuring t_2, respectively. In contrast, CRB is insensitive to the T_2 and t_1 values and worth employing if we can cope with inhomogeneous dephasing. By comparing carefully with the effects of sublevel inhomogeneous broadening Δ_{12} on the various Raman signals, we can estimate the t_2 value even when $t_2 > 1/\Delta_{12}$. The ground-state t_2 values of the Λ-type three-level system identified in the $^{167}Er^{3+}$ ions are approximately 12 and 50 μs when the dopant concentrations are 0.005 and 0.001 at%, respectively. These t_2 values are long enough to realize electromagnetically induced transparency and coherent population trapping with an Er^{3+}:Y_2SiO_5 crystal at a wavelength of 1.5 μm.

Large-scale Collection and Analysis of Personal Questions for Dialogue Agents

H. Sugiyama, T. Meguro, and R. Higashinaka

In conversational dialogue, a talker sometimes asks questions that relate to the other talker's personality, such as his/her favorites and experiences. This behavior also appears in conversational dialogues with a dialogue system; therefore, the system should be developed so that it responds to this kind of question. Previous systems realized this function by creating question-answer pairs by hand. However, there is no work that examines the coverage of the created question-answer pairs over real conversations. This study analyzes a huge amount of question-answer pairs created by many question-generators, with one answer-generator for each character. Our analysis shows that 41% of personality questions that appeared in real conversations are covered by the created pairs. We also investigated the types of questions that are frequently asked.