External Awards

Best Paper Award
Winner: Yuiko Tsunomori, NTT DOCOMO, INC.; Ryuichiro Higashinaka, NTT Media Intelligence Laboratories; and Takeshi Yoshimura, NTT DOCOMO, INC.
Date: February 21, 2019
Organization: The Institute of Electronics, Information and Communication Engineers (IEICE) Technical Committee on Natural Language Understanding and Models of Communication (NLC)

For "A Long-term Evaluation of a Chat-oriented Dialogue System that Utilizes User Information Acquired through Dialogue."
Published as: Y. Tsunomori, R. Higashinaka, and T. Yoshimura, "A Long-term Evaluation of a Chat-oriented Dialogue System that Utilizes User Information Acquired through Dialogue," IEICE Tech. Rep., Vol. 118, No. 122, NLC2018-4, pp. 29–34, July 2018.

Maejima Hisoka Award
Winner: Masayuki Abe, NTT Secure Platform Laboratories
Date: February 26, 2019
Organization: Tsushinbunka Association

For his pioneering research on secure and user-friendly electronic signatures and cryptographic protocols.

IEICE Information Networks Best Research Award
Winner: Yasuhiro Ikeda, Keisuke Ishibashi, Yuusuke Nakano, Keishiro Watanabe, and Ryoichi Kawahara, NTT Network Technology Laboratories
Date: March 4, 2019
Organization: IEICE Technical Committee on Information Networks (IN)

For "Retraining Anomaly Detection Model Using Autoencoder."
Published as: Y. Ikeda, K. Ishibashi, Y. Nakano, K. Watanabe, and R. Kawahara, "Retraining Anomaly Detection Model Using Autoencoder," IEICE Tech. Rep., Vol. 117, No. 397, IN2017-84, pp. 77–82, Jan. 2018.

IOP Publishing Outstanding Reviewer Award 2018
Winner: Xuejun Xu, NTT Basic Research Laboratories
Date: March 13, 2019
Organization: IOP Publishing Limited

For his outstanding work as a reviewer of semiconductor science and technology in 2018.

TELECOM System Technology Award
Winner: Hideki Maeda, Kohei Saito, Takashi Kotanigawa, Takeshi Seki, NTT Network Service Systems Laboratories; Shuto Yamamoto, Fukutaro Hamaoka, NTT Network Innovation Laboratories; and Mitsuteru Yoshida, NTT Electronics Corporation
Date: March 20, 2019
Organization: The Telecommunications Advancement Foundation

For "Field Trial of 400-Gbps Transmission Using Advanced Digital Coherent Technologies."
Published as: H. Maeda, K. Saito, T. Kotanigawa, T. Seki, S. Yamamoto, F. Hamaoka, and M. Yoshida, "Field Trial of 400-Gbps Transmission Using Advanced Digital Coherent Technologies," J. Lightw. Technol., Vol. 35, No. 12, June 2017.

Young Researcher's Award
Winner: Toshiro Nakahira, NTT Access Network Service Systems Laboratories
Date: March 21, 2019
Organization: IEICE

For "802.11ax Based Multi-RF Control Method for WiSMA" and "Spatial Resource Optimization under Multi-interface Control Scheme on Strategy Management Architecture for Wireless Resource Optimization (WiSMA)."
Published as: T. Nakahira, T. Murakami, H. Abeysekera, K. Ishihara, A. Inoki, K. Wakao, Y. Takatori, and T. Hayashi, "802.11ax Based Multi-RF Control Method for WiSMA," Proc. of the 2018 IEICE General Conference, B-5-135, Tokyo, Japan, Mar. 2018 (in Japanese). T. Nakahira, H. Abeysekera, T. Murakami, K. Ishihara, and T. Hayashi, "Spatial Resource Optimization under Multi-interface Control Scheme on Strategy Management Architecture for Wireless Resource Optimization (WiSMA)," Proc. of the 2018 IEICE Society Conference, B-5-96, Kanazawa, Ishikawa, Japan, Sept. 2018 (in Japanese).

Young Researcher's Award
Winner: Akito Suzuki, NTT Network Technology Laboratories
Date: March 21, 2019
Organization: IEICE

For "Evaluation of Routing Control Method Utilizing External Information on Large-volume Traffic Generation" and "Applicability Evaluation of NFV-integrated Control Method Using Reinforcement Learning."
Published as: A. Suzuki, M. Kobayashi, S. Harada, and R. Kawahara, "Evaluation of Routing Control Method Utilizing External Information on Large-volume Traffic Generation," Proc. of the 2018 IEICE General Conference, B-7-22, Tokyo, Japan, Mar. 2018 (in Japanese). A. Suzuki, M. Kobayashi, S. Harada, and R. Kawahara, "Applicability Evaluation of NFV-integrated Control Method Using Reinforcement Learning," Proc. of the 2018 IEICE Society Conference, B-7-12, Kanazawa, Ishikawa, Japan, Sept. 2018 (in Japanese).

Papers Published in Technical Journals and Conference Proceedings

Live Line Aging Estimation of AC Adapters

F. Ishiyama and Y. Toriumi

Proc. of the 18th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2018), pp. 175–178, Louisville, KY, USA, December 2018.

There is a risk that highly deteriorated alternating current (AC) adapters may ignite and catch fire. If we could estimate the extent of aging using live line measurement, we would be able to find deteriorated AC adapters without interrupting the operation of electrical equipment. As we know that deteriorated AC adapters cause electromagnetic noise on power lines, we conducted a study to ascertain if we could estimate the extent of aging from the intensity of the noise. We found that this was possible using our method of time series analysis, which has extremely high time-frequency resolution. In this paper, we describe our method and present the results of the analysis.

Intelligent Monitoring of Optical Fiber Bend Using Artificial Neural Networks Trained with Constellation Data

T. Tanaka, W. Kawakami, S. Kuwabara, S. Kobayashi, and A. Hirano

IEEE Networking Letters, DOI: 10.1109/LNET.2019.2897295, February 2019.

We demonstrate, for the first time, the highly accurate detection of the physical condition of optical fiber by using an artificial neural network (ANN). The ANN takes constellation data as its input, and outputs estimation data indicating the presence of optical fiber bending. This technique can estimate optical fiber condition without additional testers. We verify that the trained ANN can precisely detect optical fiber bends from test data as well as validation data in transmission lines with no optical amplifiers. The proposal is effective if optical amplifiers are used provided the amplitude spontaneous emission noise is small.

Economical Speed Adjustment Scheme Based on Deep Reinforcement Learning

M. Yoshida, K. Mizutani, T. Hata, I. Shake, and T. Kashiwai

Transactions of Society of Automotive Engineers of Japan, Vol. 50, No. 2, pp. 622–628, March 2019 (in Japanese).

In this paper, we report on a deep reinforcement learning technique that outputs the optimum speed acceleration to improve fuel economy while taking into account traffic flow on a public highway. The deep reinforcement learning utilizes the distance of spatiotemporal features of traffic signal conditions. From the simulation evaluation of our scheme, we confirmed that fuel efficiency can be improved by about 10% while maintaining the overall traffic flow with the proposed method, compared to the rule-base speed adjustment scheme.

Development of Resilient Information and Communications Technology for Relief against Natural Disasters

H. Kumagai, H. Sakurauchi, S. Koitabashi, T. Uchiyama, S. Sasaki, K. Noda, M. Ishizaki, S. Kotabe, A. Yamamoto, Y. Shimizu, Y. Suzuki, Y. Owada, K. Temma, G. Sato, T. Miyazaki, P. Li, Y. Kawamoto, N. Kato, and H. Nishiyama

Journal of Disaster Research, Vol. 14, No. 2, pp. 348–362, March 2019.

The study focused on the research and development of information and communication technology (ICT) for disaster preparedness and response with respect to two categories, namely, the delivery of alert messages to a wider group of residents and providing quick relief communications in affected areas. In the former category, the development focused on two targets, one involving the delivery of alert messages to indoor residents with a V-Low broadcasting service and the other involving the delivery of an alert message to individuals with disabilities and difficulties in understanding Japanese. In the latter category, a portable ICT unit was developed for rapid relief communications, and mesh network technology enabling robust information sharing among base stations in the affected area was developed. Furthermore, a related development focused on a resilient information management system to collect information in areas that do not have access to the Internet. Furthermore, device relay technology was developed to expand access network coverage areas. After the development of individual technology, activities for the societal implementation of the development results were conducted through field experiments and disaster drills in which the developed technologies were integrated and utilized.
