External Awards

IPSJ Contribution Award

Winner: Katsumi Takahashi, NTT Social Informatics Laboratories Date: June 1, 2023

Organization: Information Processing Society of Japan (IPSJ)

For contribution to the technology and legal system of data security and privacy.

3rd place at iPWS Cup 2023

Winners: Takayuki Miura, NTT Social Informatics Laboratories; Masanobu Kii, NTT Social Informatics Laboratories: Atsunori Ichikawa, NTT Social Informatics Laboratories; Juko Yamamoto, NTT Social Informatics Laboratories

Date: August 28, 2023

Organization: iPWS Cup Committee, International Workshop on Security (IWSEC) 2023

Won 3rd place overall at iPWS Cup 2023, a data anonymization competition held at IWSEC 2023.

Outstanding Paper Award

Winners: Naoki Azuma, Nihon University; Toshiki Onishi, Nihon University; Shunichi Kinoshita, Nihon University; Ryo Ishii, NTT Human Informatics Laboratories; Atsushi Fukayama, NTT Human Informatics Laboratories; Takao Nakamura, NTT Human Informatics Laboratories; Akihiro Miyata, Nihon University

Date: September 19, 2023

Organization: IPSJ/Multimedia, Distributed, Cooperative, and Mobile Symposium (DICOMO) 2023

For "A Study on Prediction of Listener's Various Backchannels Based on Multimodal Information."

Published as: N. Azuma, T. Onishi, S. Kinoshita, R. Ishii, A. Fukayama, T. Nakamura, and A. Miyata, "A Study on Prediction of Listener's Various Backchannels Based on Multimodal Information," Proc. of DICOMO 2023, 3A-2, Toyama, Japan, July 2023.

2nd place at PWS Cup 2023

Winners: Tomoya Matsumoto, Osaka University; Yumeki Goto, Osaka University; Hiroki Tejima, Osaka University; Takayuki Miura, NTT Social Informatics Laboratories; Issa Sugiura, Osaka University Date: November 1, 2023

Organization: 9th Privacy Workshop (PWS 2023)

Won 2nd place overall (3rd place in anonymization and 2nd place in attribute estimation) at PWS Cup 2023, a data anonymization and attribute estimation competition held at PWS 2023.

ACC Finalist in Creative Innovation Category, ACC TOKYO **CREATIVITY AWARDS**

Winners: Tatsuya Kako, NTT Computer and Data Science Laboratories; Hironobu Chiba, NTT Computer and Data Science Laboratories; Akira Nakayama, NTT Computer and Data Science Laboratories; Kenichi Noguchi, NTT Computer and Data Science Laboratories; Shoichiro Saito, NTT Computer and Data Science Laboratories; Hiroshi Sakai, NTT Sonority, Inc.; Jun Iwase, NTT Sonority, Inc.; Hiroaki Sato, NTT Sonority, Inc.; Yoichiro Kakiyama, NTT Sonority, Inc.; Kenta Yamada, NTT Sonority, Inc.; Chihiro Sasaki, NTT Sonority, Inc.; Yoshiaki Kozaki, NTT Sonority, Inc.; Tsukasa Kumagai, NTT Sonority, Inc.; Koichi Sugiura, NTT Sonority, Inc.; Itaru Sugita, NTT Sonority, Inc.; Kazunori Kobayashi, NTT Sonority, Inc.; Shintaro Takeuchi, NTT Sonority, Inc. Date: November 2, 2023

Organization: All Japan Confederation of Creativity (ACC)

For research and development of nwm MWE001 open ear earphone that reduces sound leakage.

ICETC 2023 Best Poster Award

Winner: Jumpei Hayakawa, NTT Access Network Service Systems Laboratories

Date: November 30, 2023

Organization: The Institute of Electronics, Information and Communication Engineers (IEICE) Communications Society

For "Simple Method for Measuring Spatial Mode Dispersion in Coupled Multi-Core Fibers without Accessing Both Ends."

Published as: J. Hayakawa, A. Nakamura, M. Nakamori, and Y. Koshikiya, "Simple Method for Measuring Spatial Mode Dispersion in Coupled Multi-Core Fibers without Accessing Both Ends," International Conference on Emerging Technologies for Communications (ICETC) 2023, P1-10, Sapporo, Japan, Nov./Dec. 2023.

Fellow

Winner: Yoji Yamato, NTT Network Service Systems Laboratories Date: December 11, 2023 **Organization:** IEICE

For research and practical application of the advanced open source cloud.

Honorable mention

Winner: Team NTT-EASE (Yuki Kubo, NTT Social Informatics Laboratories; Tomoya Yamashita, NTT Social Informatics Laboratories; Masanori Yamada, NTT Social Informatics Laboratories) Date: December 23, 2023 Organization: Dialogue Robot Competition (DRC) 2023

For "Dialogue System of Team NTT-EASE for DRC2023." Published as: Y. Kubo, T. Yamashita, and M. Yamada, "Dialogue System of Team NTT-EASE for DRC2023," arXiv:2312.13734, 2023.

OFT Young Researcher's Award

Winner: Ryota Imada, NTT Access Network Service Systems Laboratories

Date: January 11, 2024

Organization: IEICE Technical Committee on Optical Fiber Technologies (OFT)

For "A Study on Bending Loss Property of Coupled Multicore Fiber."

Published as: R. Imada, T. Sakamoto, T. Mori, Y. Yamada, and K. Nakajima, "A Study on Bending Loss Property of Coupled Multicore Fiber," OFT2022-58, 2023.

Papers Published in Technical Journals and Conference Proceedings

Catalytic Transformation from Computationally-universal to Strictly-universal Measurement-based Quantum Computation

Y. Takeuchi

arXiv:2312.16433, December 2023.

There exist two types of universality in measurement-based quantum computation (MBQC): *strict* and *computational* universalities. It is well known that the former is stronger than the latter. In this paper, we give a method of transforming from a certain type of computationally-universal MBQC to the strictly-universal one. Our method simply replaces a single qubit in a resource state with a Pauli-Y eigenstate. We apply our method to show that hypergraph states can be made strictly universal with only Pauli measurements, while only computationally-universal hypergraph states were known so far.

Blind and Spatially-regularized Online Joint Optimization of Source Separation, Dereverberation, and Noise Reduction

T. Ueda, T. Nakatani, R. Ikeshita, K. Kinoshita, S. Araki, and S. Makino

IEEE ACM Trans. Audio Speech Lang. Process., Vol. 32, pp. 1157–1172, January 2024.

This paper proposes a computationally efficient joint optimization

algorithm that performs online source separation, dereverberation, and noise reduction based on blind and spatially-regularized processing. When applying such online Blind Source Separation (BSS) as online Independent Vector Extraction (IVE) to a speech application, we must focus on the trade-off between the algorithmic delay and separation accuracy, both of which depend on the analysis frame length. In addition, to separate the sources with specified source permutation, researchers introduced spatial regularization based on the Directions-of-Arrival (DOAs) of the sources into IVE. However, the scale ambiguity of IVE often makes the spatial regularization work inappropriately. To solve these problems, we first propose a blind online joint optimization algorithm of IVE and weighted prediction error dereverberation (WPE). This online algorithm can achieve accurate separation even using short analysis frames because reverberation can be reduced using WPE. We then extend the online joint optimization with robust spatial regularization. We reveal that regularizing the scale of the separated signals is very effective in making the DOA-based spatial regularization work reliably. Our experiments confirm that our blind online joint optimization algorithm can significantly improve the separation accuracy with an algorithmic delay of 8 ms. In addition, we confirm that the proposed spatially-regularized online joint optimization algorithm reduces the rate of the source permutation error to zero percent.