

External Awards

Spotlight on Optics

Winner: Toru Kawakami, Tohoku University; Munekazu Date, NTT Media Intelligence Laboratories; Mutsumi Sasai, Tohoku University; Hideaki Takada, NTT Media Intelligence Laboratories

Date: October 5, 2017

Organization: The Optical Society (OSA)

For “360-degree Screen-free Floating 3D Image in a Crystal Ball Using a Spatially Imaged Iris and Rotational Multiview DFD Technologies.”

A rotational multiview depth-fused 3D (DFD) display and 360-deg displaying optics using a spatially imaged iris method are proposed to realize a 360-deg 3D image. This method enables displaying clear floating images in a crystal ball. Its symmetric optics provide clear and natural 360-deg images with smooth motion parallax in horizontal and vertical directions using the directional selectivity of a spatially imaged iris method and natural 3D images of a rotational multiview DFD display.

Published as: T. Kawakami, M. Date, M. Sasai, and H. Takada, “360-degree Screen-free Floating 3D Image in a Crystal Ball Using a Spatially Imaged Iris and Rotational Multiview DFD Technologies,” *Appl. Opt.*, Vol. 56, No. 22, pp. 6156–6167, 2017.

ISUILS Best Poster Presenter Award

Winner: Katsuya Oguri, NTT Basic Research Laboratories

Date: November 2, 2017

Organization: International Symposium on Ultrafast Intense Laser Science XVI (ISUILS2017)

For “Development of Time-resolved ARPES and Absorption Spectroscopy System Based on Quasi-monocycle-pulse Driven High-order Harmonic Source.”

We have developed a time-resolved ARPES (angle-resolved photoemission spectroscopy) and absorption spectroscopy system based on a quasi-monocycle-pulse driven high-order harmonic source driven by 20-5 fs NIR (near infrared) pulses. This system can be expected to measure electron dynamics in the whole Brillouin zone at less than 5 fs temporal resolution.

Published as: K. Toume, K. Oguri, H. Mashiko, K. Kato, A. Suda, and H. Gotoh, “Development of Time-resolved ARPES and Absorption Spectroscopy System Based on Quasi-monocycle-pulse Driven High-order Harmonic Source,” *ISUILS2017*, Lijiang, China, Oct./Nov. 2017.

Major results of 2016 from Nanotechnology Platform Japan program

Winner: Masayuki Hashisaka and Koji Muraki, NTT Basic Research Laboratories; Toshimasa Fujisawa, Tokyo Institute of Technology

Date: February 14, 2018

Organization: Nanotechnology Platform Japan program by the Ministry of Education, Culture, Sports, Science and Technology

For research on charge dynamics in quantum Hall edge channels.

This award is given for fine results obtained with the help of Nanotechnology Platform Japan. The research topics are one-dimensional electron dynamics in a quantum Hall Tomonaga-Luttinger liquid and time-domain observation of spin-charge separation in quantum Hall edge channels.

Excellent Interactive Award

Winner: Atsushi Otsuka, Kyosuke Nishida, Itsumi Saito, Hisako Asano, and Junji Tomita, NTT Media Intelligence Laboratories

Date: March 6, 2018

Organization: The 10th Forum on Data Engineering and Information Management (DEIM2018)

For “Neural Network Based Question Generation Model for Identifying Question Intention” (in Japanese).

Published as: A. Otsuka, K. Nishida, I. Saito, H. Asano, and J. Tomita, “Neural Network Based Question Generation Model for Identifying Question Intention,” *DEIM2018*, Fukui, Japan, Mar. 2018.

NLP2018 Best Paper Award

Winner: Kyosuke Nishida, Itsumi Saito, Atsushi Otsuka, Hisako Asano, and Junji Tomita, NTT Media Intelligence Laboratories

Date: March 12, 2018

Organization: The Association for Natural Language Processing

For “Large-scale Machine Reading Comprehension with Multi-task Learning of Information Retrieval” (in Japanese).

Published as: K. Nishida, I. Saito, A. Otsuka, H. Asano, and J. Tomita, “Large-scale Machine Reading Comprehension with Multi-task Learning of Information Retrieval,” *The 24th Annual Meeting of the Association for Natural Language Processing (NLP2018)*, D5-2, Okayama, Japan, Mar. 2018.

Awaya Prize Young Researcher Award

Winner: Yusuke Ijima, NTT Media Intelligence Laboratories

Date: March 14, 2018

Organization: The Acoustical Society of Japan (ASJ)

For “Performance Evaluation of Prosody Aware Word-level Encoder for DNN-based Speech Synthesis.”

Published as: Y. Ijima, N. Hojo, R. Masumura, and T. Asami, “Performance Evaluation of Prosody Aware Word-level Encoder for DNN-based Speech Synthesis,” *Proc. of ASJ Autumn Meeting*, 1-R-43, pp. 261–262, Ehime, Japan, Sept. 2017.

Young Researcher's Award

Winner: Takuto Kimura, NTT Network Technology Laboratories

Date: March 22, 2018

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

For “A Study of Throughput Estimation Method for Mobile Video Streaming.”

Published as: T. Kimura, T. Okuyama, A. Matsumoto, and T. Hayashi, “A Study of Throughput Estimation Method for Mobile Video Streaming,” *Proc. of the 2017 IEICE General Conference*, B-11-10, Nagoya, Aichi, Japan, Mar. 2017.

Young Researcher's Award

Winner: Go Itami, NTT Network Technology Laboratories

Date: March 22, 2018

Organization: IEICE

For “A Study on Filtering Characteristics of FSS for Advanced EM Shielding.”

Published as: Go Itami, Y. Toriumi, and K. Takaya, "A Study on Filtering Characteristics of FSS for the Advanced EM Shielding," Proc. of the 2017 IEICE General Conference, B-4-17, Nagoya, Aichi, Japan, Mar. 2017.

EMCJ Young Engineer Award in 2017

Winner: Go Itami, NTT Network Technology Laboratories

Date: March 22, 2018

Organization: IEICE Technical Committee on Electromagnetic Compatibility (EMCJ)

For "An Analytical Study on the Advanced EM Shielding for Mobile Devices to Provide Sufficient Transparency in Frequency Bands Used for Wireless Communications and Attenuation in Other Frequencies."

This paper describes a proposal of an advanced electromagnetic

shield, which realizes both the suppression of electromagnetic radiation, and wireless communications, by applying electromagnetic-controllable materials on the shield, which is called a frequency selective surface (FSS). We have studied resonator structures of the FSS by electromagnetic field analysis, focusing on the number and center values of resonant frequencies of the FSS while considering size limitations. As a result, we have found the multi-band resonance of the FSS by applying self-similarity structures on it and found a downward shift of the resonant frequency of the FSS by extending its electrical pathways.

Published as: Go Itami, Y. Toriumi, and K. Takaya, "An Analytical Study on the Advanced EM Shielding for Mobile Devices to Provide Sufficient Transparency in Frequency Bands Used for Wireless Communications and Attenuation in Other Frequencies," IEICE Tech. Rep., Vol. 116, No. 399, EMCJ2016-117, pp. 45–50, 2017.

Papers Published in Technical Journals and Conference Proceedings

Speech Rhythm in Adults with Autism Spectrum Disorders

I. Lin, S. Hiroya, K. Asada, S. Ayaya, S. Kumagaya, and M. Kato
Acoustical Science and Technology, Vol. 39, No. 2, pp. 154–157, March 2018.

This paper examined speech in well-controlled speech materials of adults with and without autism spectrum disorders (ASD). The results show that ASD participants had longer phoneme duration for unvoiced consonants /t/ and /k/ and shorter phoneme duration for voiced consonants /d/, /g/, and /r, l/. Otherwise, there was no significant between-group difference in speech fluency, pause durations, voice onset times (for /d/, /g/, /t/, and /k/), phoneme errors, fundamental frequency, or formants. This indicates that ASD adults might have some residual errors due to audio-vocal control.

Ultrafast Terahertz Nonlinear Optics of Landau Level Transitions in a Monolayer Graphene

G. Yumoto, R. Matsunaga, H. Hibino, and R. Shimano

Physical Review Letters, Vol. 120, No. 10, 107401, March 2018.

We investigated the ultrafast terahertz (THz) nonlinearity in a monolayer graphene under a strong magnetic field using THz pump-THz probe spectroscopy. An ultrafast suppression of the Faraday rotation associated with inter-Landau level (LL) transitions is observed, reflecting the Dirac electron character of nonequidistant LLs with large transition dipole moments. A drastic modulation of electron distribution in LLs is induced by far off-resonant THz pulse excitation in the transparent region. Numerical simulation based on the density matrix formalism without rotating-wave approximation reproduces the experimental results. Our results indicate that the

strong light-matter coupling regime is realized in graphene, with the Rabi frequency exceeding the carrier wave frequency and even the relevant energy scale of the inter-LL transition.

Correlation Analysis between Code Clone Metrics and Project Data on the Same Specification Projects

Y. Higo, S. Matsumoto, S. Kusumoto, T. Fujinami, and T. Hoshino
Proc. of the 12th International Workshop on Software Clones (IWSC 2018), pp. 37–43, Campobasso, Italy, March 2018.

The presence of code clones is pointed out as a factor that makes software maintenance more difficult. On the other hand, some research studies reported that only a small part of code clones requires simultaneous changes, and their negative influences on software maintenance are limited. Some other studies reported that code clones often have positive effects on software development. Currently, the authors are researching exploring the effect of clones on software development and maintenance. In this paper, the authors report their exploratory results on the relationship between clone metrics and project data such as the number of test cases and the number of found bugs. The targets of this exploration are nine web-based software systems. Interestingly, all of them were developed based on the same specifications. In other words, they are functionally the same software systems. By targeting such projects, we can explore how implementation differences affect software development. As a result, unit/integration/system testing become more difficult in cases where many clones exist in a project.