External Awards

The Commendation for Science and Technology by the Minister of Education, Culture, Sports, Science and Technology, Prize for Science and Technology, Development Category
Winner: Ryuichiro Higashinaka, NTT Media Intelligence Laboratories; Minoru Etoh, Yoshinori Isoda, and Takeshi Yoshimura, NTT DOCOMO
Date: April 20, 2016
Organization: Ministry of Education, Culture, Sports, Science and Technology

For their development of a voice agent service.

Best Paper Award
Winner: Go Irie and Hiroyuki Arai, NTT Media Intelligence Laboratories; Yukinobu Taniguchi, Tokyo University of Science
Date: June 2, 2016
Organization: The Institute of Electronics, Information and Communication Engineers (IEICE)

For "Hashing with Locally Linear Projections."
Published as: G. Irie, H. Arai, and Y. Taniguchi, "Hashing with Locally Linear Projections," IEICE Trans. Information and Systems (Japanese Edition), Vol. J97-D, No. 12, pp. 1785–1796, Dec. 2014.

Excellent Paper Award
Winner: Harumi Kawamura, Salesian Polytechnic; Yasuhiro Yao, Dimension Data; Shunichi Yonemura, Shibaura Institute of Technology; Jun Ohya, Waseda University; Akira Kojima, NTT Media Intelligence Laboratories
Date: June 18, 2016
Organization: The Institute of Image Electronics Engineers of Japan

For "Estimating Scene Illuminant Colors from the Color Images Acquired by a Fixed Camera under Different Illuminations."
Published as: H. Kawamura, Y. Yao, S. Yonemura, J. Ohya, and A. Kojima, "Estimating Scene Illuminant Colors from the Color Images Acquired by a Fixed Camera under Different Illuminations," The Journal of the Institute of Image Electronics Engineers of Japan, Vol. 43, No. 2, pp. 164–174, Nov. 2014.

IEICE ISS Young Researcher's Award in Speech Field
Winner: Yusuke Ijima, NTT Media Intelligence Laboratories
Date: August 25, 2016
Organization: IEICE Information and Systems Society (ISS)

For "Objective Evaluation of Synthetic Speech Using Association between Dimensions within Spectral Features."
Published as: Y. Ijima, T. Asami, and H. Mizuno, "Objective Evaluation of Synthetic Speech Using Association between Dimensions within Spectral Features," IEICE Tech. Rep., Vol. 115, No. 392, SP2015-90, pp. 27–32, Jan. 2016.

IEICE ISS Young Researcher's Award in Speech Field
Winner: Taichi Asami, NTT Media Intelligence Laboratories
Date: August 25, 2016
Organization: IEICE ISS

For "Training Data Selection for Acoustic Modeling Based on Submodular Optimization of Joint KL Divergence."

Published as: T. Asami, R. Masumura, H. Masataki, M. Okamoto, and S. Sakauchi, "Training Data Selection for Acoustic Modeling Based on Submodular Optimization of Joint KL Divergence," IEICE Tech. Rep., Vol. 115, No. 184, SP2015-58, pp. 45–50, Aug. 2015.

FIT2016 Funai Best Paper Award
Winner: Yukihiro Bandoh, Seishi Takamura, and Atsushi Shimizu, NTT Media Intelligence Laboratories
Date: September 8, 2016
Organization: The 15th Forum on Information Technology (FIT2016)

For "Encoding-oriented Video Generation Algorithm Based on Control with High Temporal Resolution."
Published as: Y. Bandoh, S. Takamura, and A. Shimizu, "Encoding-oriented Video Generation Algorithm Based on Control with High Temporal Resolution," Proc. of FIT2016, RI-002, Toyama, Japan, Sept. 2016.

FIT2016 Paper Award
Winner: Yuichi Sayama, Yukihiro Bandoh, Seishi Takamura, and Atsushi Shimizu, NTT Media Intelligence Laboratories
Date: September 8, 2016
Organization: FIT2016

For "Optimal Design of Adaptive Intra Predictors Based on Sparsity Constraint."
Published as: Y. Sayama, Y. Bandoh, S. Takamura, and A. Shimizu, "Optimal Design of Adaptive Intra Predictors Based on Sparsity Constraint," Proc. of FIT2016, RI-003, Toyama, Japan, Sept. 2016.

Technical Committee Prize Paper Award
Winner: Hiroyuki Manabe, NTT DOCOMO; Munekazu Date and Hideaki Takada, NTT Media Intelligence Laboratories; Hiroshi Inamura, NTT DOCOMO
Date: October 3, 2016
Organization: The Industrial Lighting and Displays Committee, Institute of Electrical and Electronics Engineers (IEEE) Industrial and Applications Society (IAS)

For "Low Power Driving Techniques for 1-pixel Displays."
Published as: H. Manabe, M. Date, H. Takada, and H. Inamura, "Low Power Driving Techniques for 1-pixel Displays," Proc. of the IEEE IAS Annual Meeting 2015, Dallas, TX, USA, Oct. 2015.

Best Poster Award
Winner: Seishi Takamura, NTT Media Intelligence Laboratories
Date: December 1, 2016
Organization: The 31st Picture Coding Symposium of Japan and 21st Image Media Processing Symposium (PCSJ/IMPS 2016)

For "Efficient Video Coding Based on Object Tracking."
Published as: S. Takamura, "Efficient Video Coding Based on Object Tracking," PCSJ/IMPS 2016, P-2-16, Shizuoka, Japan, Nov. 2016.

Best Poster Award
Winner: Takayuki Sasaki, NTT Media Intelligence Laboratories
Date: December 1, 2016
Organization: PCSJ/IMPS 2016

For "Accelerated Optimization of Nuclear Norm in Region Coding."

Published as: T. Sasaki, "Accelerated Optimization of Nuclear Norm in Region Coding," PCSJ/IMPS 2016, P-3-20, Shizuoka, Japan, Nov. 2016.

Best Paper Award

Winner: Takahiro Suzuki, Sang-Yuep Kim, Jun-ichi Kani, Ken-Ichi Suzuki, and Akihiro Otaka, NTT Access Network Service Systems Laboratories

Date: December 7, 2016

Organization: Transmission, Access, and Optical Systems (TAOS) Technical Committee, IEEE Communications Society

For "Real-time Demonstration of PHY Processing on CPU for Programmable Optical Access Systems."

Published as: T. Suzuki, S. Kim, J. Kani, K. Suzuki, and A. Otaka, "Real-time Demonstration of PHY Processing on CPU for Programmable Optical Access Systems," 2016 IEEE Global Communications Conference, Washington, DC, USA, Dec. 2016.

Outstanding Reviewer Award 2016

Winner: William J. Munro, NTT Basic Research Laboratories

Date: February 3, 2017

Organization: IOP Publishing

This award is given to reviewers for their expertise and outstanding contribution to *New Journal of Physics*.

IDW/AD'16 Demonstration Award

Winner: Shin'ya Nishida, Takahiro Kawabe, Taiki Fukiage, and Masataka Sawayama, NTT Communication Science Laboratories

Date: February 10, 2017

Organization: The Institute of Image Information and Television Engineers and the Society for Information Display

For "Animating Static Objects by Illusion-based Projection Mapping."

Published as: S. Nishida, T. Kawabe, T. Fukiage, and M. Sawayama, "Animating Static Objects by Illusion-based Projection Mapping," IDW/AD'16 (The 23rd International Display Workshops in conjunction with Asia Display 2016), Sendai, Japan, Dec. 2016.

RSA Conference Award (Excellence in the Field of Mathematics)

Winner: Tatsuaki Okamoto, NTT Secure Platform Laboratories

Date: February 14, 2017

Organization: RSA Conference

For the last 30 years, he has been actively working in many areas of cryptography and has become a world leader in the field based on his numerous fundamental solutions and other central contributions.

Papers Published in Technical Journals and Conference Proceedings

Differential Contributions of GABA Concentration in Frontal and Parietal Regions to Individual Differences in Attentional Blink

K. Kihara, H. M. Kondo, and J. Kawahara

The Journal of Neuroscience, Vol. 36, No. 34, pp. 8895–8901, August 2016.

Selective attention plays an important role in identifying transient objects in a complex visual scene. Attentional control ability varies with observers. However, it is unclear what neural mechanisms are responsible for individual differences in attentional control ability. The present study used the following attentional blink paradigm: when two targets are to be identified in rapid serial visual presentation, the processing of the first target interrupts the identification of the second one appearing within 500 ms after the first-target onset. It has been assumed that the reduction of the second-target accuracy is mainly due to a transient inhibition of attentional reorienting from the first to the second target, which is modulated by the g-aminobutyric acid (GABA) system. Using magnetic resonance spectroscopy, we investigated whether individual variation of attentional blink magnitude is associated with GABA concentrations in the left prefrontal cortex (PFC), right posterior-parietal cortex (PPC), and visual cortex (VC) of humans. GABA concentrations in the PFC were related negatively to attentional blink magnitude and positively to the first-target accuracy. GABA concentrations in the PPC were positively correlated with attentional blink magnitude. However, GABA concentrations in the VC did not contribute to attentional blink magnitude and first-target accuracy. Our results suggest that frontoparietal inhibitory mechanisms are closely linked with individual differences in attentional processing and that functional roles of the GABAergic system in selective attention differ between the PFC and PPC.

Auditory and Visual Scene Analysis: an Overview

H. M. Kondo, A. M. van Loon, J. Kawahara, and B. C. J. Moore

Philosophical Transactions of the Royal Society B, Vol. 372, 20160099, January 2017.

We perceive the world as stable and composed of discrete objects even though auditory and visual inputs are often ambiguous owing to spatial and temporal occluders and changes in the conditions of

observation. This raises important questions regarding where and how 'scene analysis' is performed in the brain. Recent advances from both auditory and visual research suggest that the brain does not simply process the incoming scene properties. Rather, top-down processes such as attention, expectations and prior knowledge facilitate scene perception. Thus, scene analysis is linked not only with the extraction of stimulus features and formation and selection of perceptual objects, but also with selective attention, perceptual binding and awareness. This special issue covers novel advances in scene-analysis research obtained using a combination of psychophysics, computational modelling, neuroimaging and neurophysiology, and presents new empirical and theoretical approaches. For integrative understanding of scene analysis beyond and across sensory modalities, we provide a collection of 15 articles that enable comparison and integration of recent findings in auditory and visual scene analysis.

Auditory Multistability and Neurotransmitter Concentrations in the Human Brain

H. M. Kondo, D. Farkas, S. L. Denham, T. Asai, and I. Winkler

Philosophical Transactions of the Royal Society B, Vol. 372, 20160110, January 2017.

Multistability in perception is a powerful tool for investigating sensory–perceptual transformations, because it produces dissociations between sensory inputs and subjective experience. Spontaneous switching between different perceptual objects occurs during prolonged listening to a sound sequence of tone triplets or repeated words (termed auditory streaming and verbal transformations, respectively). We used these examples of auditory multistability to examine to what extent neurochemical and cognitive factors influence the observed idiosyncratic patterns of switching between perceptual objects. The concentrations of glutamate-glutamine (Glx) and g-aminobutyric acid (GABA) in brain regions were measured by magnetic resonance spectroscopy, while personality traits and executive functions were assessed using questionnaires and response inhibition tasks. Idiosyncratic patterns of perceptual switching in the two multistable stimulus configurations were identified using a multidimensional scaling (MDS) analysis. Intriguingly, although switching patterns within each individual differed between auditory streaming and verbal transformations, similar MDS dimensions were extracted separately from the two datasets. Individual switching patterns were significantly correlated with Glx and GABA concentrations in the auditory cortex and inferior frontal cortex but not with the personality traits and executive functions. Our results suggest that auditory perceptual organization depends on the balance between neural excitation and inhibition in different brain regions.

Individual Differences in Visual Motion Perception and Neurotransmitter Concentrations in the Human Brain

T. Takeuchi, S. Yoshimoto, Y. Shimada, T. Kochiyama, and H. M. Kondo

Philosophical Transactions of the Royal Society B, Vol. 372, 20160111, January 2017.

Recent studies have shown that interindividual variability can be a rich source of information regarding the mechanism of human visual perception. In this study, we examined the mechanisms underlying interindividual variability in the perception of visual motion, one of the fundamental components of visual scene analysis, by measuring neurotransmitter concentrations using magnetic resonance spectroscopy. First, by psychophysically examining two types of motion phenomena—motion assimilation and contrast—we found that, following the presentation of the same stimulus, some participants perceived motion assimilation, while others perceived motion contrast. Furthermore, we found that the concentration of the excitatory neurotransmitter glutamate-glutamine (Glx) in the dorsolateral prefrontal cortex (Brodmann area 46) was positively correlated with the participant's tendency to motion assimilation over motion contrast; however, this effect was not observed in the visual areas. The concentration of the inhibitory neurotransmitter g-aminobutyric acid had only a weak effect compared with that of Glx. We conclude that excitatory process in the suprasensory area is important for an individual's tendency to determine antagonistically perceived visual motion phenomena.