

# Program

## Day 1

**Wednesday 5 September 2018**

Venue : Hardy Hall, Kanbai-Kan, Doshisha University

9 : 30 – 9 : 40    **Opening remark**

Koichi Hashimoto (Tohoku University)

**Chair: Kotaro Kimura**

9 : 40 – 10 : 25    **From speculation to (almost) certitude: How many years do we need to understand animal movement?**

Rory P. Wilson (Swansea University, UK)

10 : 25 – 10 : 55    **Advances in bio-logging techniques and their application to study navigation in birds and bats**

Ken Yoda (Nagoya University), Shizuko Hiryu (Doshisha University)

10 : 55 – 11 : 15    Coffee Break

**Chair: Yuichi Tsumaki**

11 : 15 – 11 : 55    **Cyber-enhanced canine -digitally strengthening the capability of dogs-**

Kazunori Ohno (Tohoku University)

11 : 55 – 12 : 20    **Decision-making for olfactory navigation mediated by mathematical integration and differentiation in worms**

Kotaro Kimura (Nagoya City University)

12 : 20 – 13 : 40    Lunch

**Chair: Ichiro Takeuchi**

13 : 40 – 14 : 25    **Curious true facts about people and location**

John Krumm (Microsoft Research, USA)

14 : 25 – 14 : 50    **AI on biologist**

Takuya Maekawa (Osaka University)

14 : 50 – 15 : 15    Coffee Break

**Chair: Toru Tamaki**

- 15 : 15 – 15 : 55 **Introduction to statistically sound data mining**  
Koji Tsuda (The University of Tokyo / AIP RIKEN)
- 15 : 55 – 16 : 10 Competition Award Ceremony
- 16 : 10 – 18 :10 Poster Presentation (Underground conference room A -地 A 会議室-)
- 18 : 30 – 20 : 30 Banquet (Hamac de Paradis, Kanbai-kan 1F)

**Day 2**  
**Thursday 6 September 2018**

**Chair: Susumu Takahashi**

- 9 : 30 – 9 : 45 **In vivo calcium imaging and behavior**  
Junichi Nakai (Saitama University)
- 9 : 45 – 10 : 00 **Robot technology and environment-driven concept enhance bio-logging science**  
Yuichi Tsumaki (Yamagata University)
- 10 : 00 – 10 : 45 **Neural circuits for navigation in the Drosophila central brain**  
Dan Turner-Evans (Howard Hughes Medical Institute, USA)
- 10 : 45 – 11 : 05 Break

**Chair: Hiroto Ogawa**

- 11 : 05 – 11 : 45 **Behavioral and neural basis of odor navigation in insects**  
Ryohei Kanzaki (The University of Tokyo)
- 11 : 45 – 12 : 10 **Neural activity in the brain of rats, seabirds and salmonid fishes during spatial navigation**  
Susumu Takahashi (Doshisha University)
- 12 : 10 – 12 : 20 **Closing remark**  
Koichi Hashimoto (Tohoku University)

## Poster Presentation

Venue: Underground conference room A -地 A 会議室-

Core time: Odd number 16:10-17:05, Even number 17:05-18:00

### **P1 Development of a Whale Rover for Biologging**

Kosuke Tsuchiya<sup>1</sup>, Yuichi Tsumaki<sup>1</sup>, Kyoichi Mori<sup>2</sup>

*1 Graduate School of Science and Engineering, Yamagata Univ., Yonezawa, Yamagata, Japan*

*2 Faculty of Life and Environmental Sciences, Teikyo Univ. of Science, Uenohara, Yamanashi, Japan*

### **P2 Study on the small and lightweight data logger separator for wild sea birds**

Takuma Abe<sup>1</sup>, Satoshi Suzuki<sup>1</sup>, Kazuki Abe<sup>1</sup>, Natsumi Kubo<sup>1</sup>, Hirokazu Suzuki<sup>2</sup>, Takashi Yamamoto<sup>2</sup>, Ken Yoda<sup>2</sup>, Riichiro Tadakuma<sup>1</sup>, Yuichi Tsumaki<sup>1</sup>

*1 Department of Mechanical Systems Engineering, Yamagata Univ., Jonan, Yonezawa-shi, Yamagata, Japan*

*2 School of Informatics and Sciences, Nagoya Univ., Furo-cho, Chikusa-ku, Nagoya, Japan*

### **P3 Do humpback whales use islands and undersea volcanoes in their navigation?**

Kyoichi Mori<sup>1</sup>, Keiko Sekiguchi<sup>2</sup>, Saeko Kumagai<sup>1</sup>

*1 Department of Animal Sciences, Teikyo Univ. of Science, Uenohara, Yamanashi, Japan*

*2 Graduate school of Arts and Science, International Cristian Univ., Mitaka, Tokyo, Japan*

### **P4 A high-pattern-rate photostimulation system capable of low-latency geometrical control for bio-navigation studies**

Shingo Kagami, Koichi Hashimoto

*Graduate School of Information Sciences, Tohoku Univ., Sendai, Japan*

### **P5 Path Key Points for Context-based Semantical Vector Representations of Birds' Trajectories**

Ilya Ardakani<sup>1</sup>, Koichi Hashimoto<sup>1</sup>, Ken Yoda<sup>2</sup>

*1 Department of System Information Sciences, Graduate School of Information Sciences, Tohoku University, Sendai, Japan*

*2 Department of Behavior and Evolution, Graduate School of Environmental Studies Nagoya University, Furo-cho, Chikusa-ku, Nagoya, 464-8601, Japan*

### **P6 Output power maximization of a vibration power generation system by extremum seeking control**

Tatsuya Take<sup>1</sup>, Yohei Kindaichi<sup>1</sup>, Shigeru Yamamoto<sup>2</sup>

*1 Graduate School of Natural Science and Technology, Kanazawa University, Kanazawa, Ishikawa, Japan*

*2 Faculty of Frontier Engineering, Kanazawa University, Kanazawa, Ishikawa, Japan*

**P7 An endless flat surface system**

Yasushi Iwatani<sup>1</sup>, Kaori Tsurui<sup>2</sup>, Atsushi Honma<sup>3,4</sup>

*1 Department of Science and Technology, Hirosaki Univ., Hirosaki, Aomori, Japan*

*2 Center for Strategic Research Project, Univ. of the Ryukyus, Nishihara, Okinawa, Japan*

*3 Okinawa Prefectural Plant Protection Center, Naha, Okinawa, Japan*

*4 Graduate School of Agriculture, Univ. of the Ryukyus, Nishihara, Okinawa, Japan*

**P8 Animal Touch 'n Go: Contactless Charging Mechanism for Wildlife Wearable Device with Surrounding Tangible Stimulus**

Hill Hiroki Kobayashi<sup>1</sup>, Atsuya Makita<sup>1</sup>, Miho Nagasawa<sup>2</sup>, Kenji Kikusui<sup>2</sup> and Hiromi Kudo<sup>1</sup>

*1 Center for Spatial Information Science, the University of Tokyo, Chiba, Japan*

*2 Department of Veterinary Medicine, Azabu University, Kanagawa, Japan*

**P9 Multimode Quasistatic Cavity Resonators for Wireless Power Transfer: Towards Empowering Freely Moving Animal Experiments in 3-D Environments**

Takuya Sasatani<sup>1,2</sup>, Yoshihiro Kawahara<sup>1</sup>

*1 Graduate School of Information Science and Technology, The Univ. of Tokyo, Tokyo, Japan*

*2 JSPS Research Fellow, Tokyo, Japan*

**P10 Preliminary Investigation of a Method for Supporting Discovery of Numeric Attribute-dependent Differences for Animal Behavior Analysis**

Daiki Higashide, Takuya Maekawa, Daichi Amagata, Takahiro Hara<sup>1</sup>, Yuichi Mizutani, Hirokazu Suzuki, Ken Yoda<sup>2</sup>

*1 Graduate School of Information Science and Technology, Osaka University*

*2 Graduate School of Environmental Studies, Nagoya University*

**P11 3D Localization of a bat in 3D from 20ch sound signal spectrograms**

Kazuki Fujimori<sup>1</sup>, Daisuke Ogawa<sup>1</sup>, Bisser Raytchev<sup>1</sup>, Kazufumi Kaneda<sup>1</sup>, Takara Miyamoto<sup>2</sup>,

Emyo Fujioka<sup>2</sup>, Shizuko Hiryu<sup>2</sup>, Toru Tamaki<sup>1</sup>

*1 Hiroshima University, Hiroshima, Japan*

*2 Doshisha University, Kyoto, Japan*

**P12 Random Global Pooling for Action Recognition**

Masashi Nishikawa, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda

*Graduate School of Engineering, Hiroshima University, Hiroshima, Japan*

**P13 Extraction frequent co-occurrence rule from multi-modal animal locomotion data using feature learning**

Yiming Tian<sup>1</sup>, Takuya Maekawa<sup>1</sup>, Daichi Amagata<sup>1</sup>, Takahiro Hara<sup>1</sup>, Sakiko Matsumoto, Ken Yoda<sup>2</sup>, Emyo Fujioka<sup>3</sup>, Fumiya Hamai<sup>4</sup>, Dai Fukui<sup>5</sup>, Shizuko Hiryu<sup>6</sup>

*1 Graduate School of Information Science and Technology Osaka University*

*2 Graduate School of Environmental Studies Nagoya University*

*3 Organization for Research Initiatives and Development, Doshisha University*

*4 Graduate School of Life and Medical Sciences Doshisha University*

*5 Graduate School of Agricultural and Life Sciences, The University of Tokyo*

*6 Doshisha University Faculty of Life and Medical Sciences*

**P14 Active learning based adaptive annotation for animal trajectory data analysis**

Tomomichi Shinkai<sup>1</sup>, Hirokazu Suzuki<sup>2</sup>, Masayuki Karasuyama<sup>1,3,4</sup>, Ken Yoda<sup>2</sup>, Ichiro Takeuchi<sup>1,3,5</sup>

*1 Department of Computer Science, Nagoya Institute of Technology, Nagoya, Aichi, Japan*

*2 Graduate School of Environmental Studies, Nagoya University, Nagoya, Aichi, Japan*

*3 Center for Materials Research by Information Integration, National Institute of Materials Science, Sengen, Tsukuba, Japan*

*4 PRESTO, JST, Kawaguchi, Saitama, Japan*

*5 RIKEN Center for Advanced Intelligence Project, Nihonbashi, Tokyo, Japan*

**P15 Comparative Pattern Mining of Human Trajectory Data**

Shinsuke Kajioka, Takahiro Uchiya

*Department of Computer Science, Nagoya Institute of Technology, Gokiso-cho, Showa ward, Nagoya, Aichi, Japan*

**P16 Efficient Searching Algorithm for Sequential Pattern Mining to Comparative Animal Trajectory Data Analysis**

Takuto Sakuma<sup>1</sup>, Ichiro Takeuchi<sup>2,3,4</sup>

*1 Dept. of Computer Science, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, Japan*

*2 Dept. of Computer Science/Research Institute for Information Science, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya, Japan*

*3 RIKEN Center for Advanced Intelligence Project, 1-4-1 Nihonbashi, Chuo-ku, Tokyo, Japan, 4*

*Center for Materials Research by Information Integration, National Institute for Materials Science, 1-2-1 Sengen, Tsukuba, Japan*

**P17 Image-based Small Object Detection and Tracking for Navigation Analysis**

Hitoshi Habe<sup>1</sup>, Kei Terayama<sup>2,3</sup>, Issei Murata<sup>4</sup>, Kyosuke Koyama<sup>1</sup>

*1 Faculty of Science and Technology, Kindai Univ., Higashi-Osaka, Osaka, Japan*

*2 RIKEN Center for Advanced Intelligence Project, Chuo-ku, Tokyo, Japan*

*3 Graduate school of Medicine, Kyoto University, Sakyo-ku, Kyoto, Japan*

*4 Graduate School of Science and Technology, Kindai Univ., Higashi-Osaka, Osaka, Japan*

**P18 Deep Learning on Mobile Devices and its Applications to Animal Video Analysis**

Yuki Izumi, Yuta Ide, Taketo Araki, Keiji Yanai  
*The University of Electro-Communication, Tokyo, Japan*

**P19 Extracting a process of obtaining route information in a situation without locality**

Kyosuke Futami<sup>1</sup>, Kazuya Murao<sup>1</sup>, Tsutomu Terada<sup>2</sup>  
*1 College of Information Science and Engineering, Ritsumeikan Univ., Kyotanabe, Shiga, Japan*  
*2 Graduate School of Engineering, Kobe Univ., Hyogo, Japan*

**P20 Biologging of daily movement of echolocating bats, *Rhinolophus ferrumequinum* Nippon and *Nyctalus aviator***

Genki Nakai<sup>1</sup>, Emyo Fujioka<sup>2</sup>, Olga Heim<sup>3</sup>, Dai Fukui<sup>4</sup>, Shizuko Hiryu<sup>1,5</sup>  
*1 Faculty of Life and Medical Sciences, Doshisha Univ., Kyotanabe, Kyoto, Japan*  
*2 Organization for Research Initiatives and Development, Doshisha Univ., Kyotanabe, Kyoto, Japan*  
*3 Leibniz Institute for Zoo and Wildlife Research., Berlin, Germany*  
*4 Graduate School of Agricultural and Life Sciences, The University of Tokyo., Yamabe-Higashimachi, Furano, Hokkaido, Japan*  
*5 JST PROJECT, Kawaguchi, Saitama, Japan*

**P21 Groups of bats mitigate signal jamming from conspecifics by decreasing vocal similarities between individuals**

Kazuma Hase<sup>1, 2</sup>, Yukimi Kadoya<sup>1</sup>, Yosuke Maitani<sup>1</sup>, Takara Miyamoto<sup>1</sup>, Takafumi Furuyama<sup>1</sup>, Kohta I. Kobayasi<sup>1</sup>, and Shizuko Hiryu<sup>1</sup>  
*1 Neuroethology and Bioengineering laboratory, Doshisha Univ., Kyotanabe, Kyoto, Japan*  
*2 Research Fellow of Japan Society for the Promotion of Science, Chiyoda-ku, Tokyo, Japan*

**P22 Echolocating bats repeatedly stay on the flyway of a nightly large-scale navigation flight**

Emyo Fujioka<sup>1</sup>, Dai Fukui<sup>2</sup>, Ken Yoda<sup>3</sup> and Shizuko Hiryu<sup>4</sup>  
*1 Organization for Research Initiatives and Development, Doshisha Univ., Kyotanabe, Kyoto, Japan*  
*2 Graduate School of Agricultural and Life Sciences, the University of Tokyo, Furano, Hokkaido, Japan*  
*3 Graduate School of Environmental Studies, Nagoya Univ., Nagoya, Aichi, Japan*  
*4 Faculty of Life and Medical Sciences, Doshisha Univ., Kyotanabe, Kyoto, Japan*

**P23 Annual comparison of foraging movement of streaked shearwaters**

Sakiko Matsumoto<sup>1</sup>, Maki Yamamoto<sup>2</sup>, Ken Yoda<sup>1</sup>  
*1 Graduate School of Environmental Studies, Nagoya Univ., Nagoya, Japan*  
*2 Department of BioEngineering, Nagaoka University of Technology, Niigata, Japan*

**P24 Age-related behavioral changes in black-tailed gulls; older gulls tend to use inland habitats, while younger gulls use ocean habitats**

Hirokazu Suzuki<sup>1</sup>, Yuichi Mizutani<sup>1</sup>, Akira Narita<sup>2</sup>, Ken Yoda<sup>1</sup>

*1 Graduate School of Environmental Studies, Nagoya University, Nagoya, Aichi, Japan*

*2 Aomori Prefectural Hachinohe Daiichi School for Special Needs Education, Hachinohe, Aomori, Japan*

**P25 Relationship between dispersal ability and sexual traits in the red flour beetle (*Tribolium castaneum*)**

Kentarou Matsumura, Takahisa Miyatake

*Graduate School of Environmental and Life Science, Okayama University, Okayama, Japan*

**P26 Short-tailed shearwaters fly and navigate efficiently under strong westerly winds over Southern Ocean**

Akinori Takahashi<sup>1</sup>, Kozue Shiomi<sup>1</sup>, Taiki Adachi<sup>2</sup>, Ken Yoda<sup>3</sup>, Fernando Arce Gonzalez<sup>4</sup>, Mary-Anne Lea<sup>4</sup>, Clive McMahon<sup>4,5</sup>, Mark Hindell<sup>4</sup>

*1 National Institute of Polar Research, Tachikawa, Tokyo, Japan*

*2 Graduate School of Science, University of Tokyo, Tokyo, Japan*

*3 Graduate School of Environmental Studies, Nagoya University, Nagoya, Japan*

*4 Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia*

*5 Sydney Institute of Marine Science, Mosman, 2088, New South Wales, Australia*

**P27 Honeybees choose their way to home using e-vector information from the sky**

Midori Sakura<sup>1</sup>, Haruka Onishi<sup>1</sup>, Akiko Okuyama<sup>1</sup>, Natsumi Matoba<sup>1</sup>, Norihiro Kobayasi<sup>1</sup>, Ryuichi Okada<sup>1,2</sup>

*1 Graduate School of Science, Kobe Univ., Kobe, Hyogo, Japan*

*2 School of Human Science and Environment, Univ. Hyogo, Himeji, Hyogo, Japan*

**P28 Place memory based on visual information in the cricket *Gryllus bimaculatus***

Nobuaki Matsubara<sup>1</sup>, Ryuichi Okada<sup>1,2</sup>, Midori Sakura<sup>1</sup>

*1 Graduate School of Science, Kobe Univ., Kobe, Hyogo, Japan*

*2 School of Human Science and Environment, Univ. Hyogo, Himeji, Hyogo, Japan*

**P29 Inside the compound eye of a migratory butterfly, *Parantica sita***

Nicolas Nagloo, Kentaro Arikawa, Michiyo Kinoshita

*Departments for Evolutionary Studies of Biosystems, SOKENDAI, Hayama, Japan*

**P30 The dorsal eye region in migratory butterfly *Parantica sita* is crucial for its phototactic behavior**

Michiyo Kinoshita, Nicolas Nagloo, Finlay Stewart

*Department of Evolutionary Studies of Biosystems, SOKENDAI, Hayama, Japan*

**P31 Are foraging areas of Adélie penguins affected by neighboring colonies?**

Kentaro Ito<sup>1</sup>, Yuuki Y. Watanabe<sup>1,2</sup>, Nobuo Kokubun<sup>1,2</sup> and Akinori Takahashi<sup>1,2</sup>

*1 Department of Polar Science, SOKENDAI (The Graduate University for Advanced Studies), Tokyo, Japan*

*2 National Institute of Polar Research, Tokyo, Japan*

**P32 Does movement pattern of Asiatic black bear *Ursus thibetanus* follow Levy walk or composite Brownian walk?**

Tomoko Naganuma<sup>1</sup>, Tetsuro Yoshikawa<sup>2</sup>, Kyohei Ando<sup>1</sup>, Chinatsu Kozakai<sup>3</sup>, Koji Yamazaki<sup>4</sup>, Shinsuke Koike<sup>1</sup>

*1 Tokyo University of Agriculture and Technology, Tokyo, Japan*

*2 National Institute for Environmental Studies, Tsukuba, Japan*

*3 National Agriculture and Food Research Organization, Tsukuba, Japan*

*4 Tokyo University of Agriculture, 1-1-1 Sakuragaoka, Setagaya, Tokyo, Japan*

**P33 Development of an analysis method for dog social network**

Ayumi Hirao<sup>1</sup>, Mayu Nishimoto<sup>1</sup>, Yuki Maruno<sup>1</sup>, Takatomi Kubo<sup>2</sup>, Kazushi Ikeda<sup>2</sup>, Takefumi Kikusui<sup>3</sup>, Miho Nagasawa<sup>3</sup>

*1 Faculty for the Study of Contemporary Society, Kyoto Women's Univ., Kyoto, Kyoto, Japan*

*2 Graduate School of Science and Technology, NAIST, Ikoma, Nara, Japan*

*3 School of Veterinary Medicine, Azabu Univ., Sagamihara, Kanagawa, Japan*

**P34 How do the departures begin in feral horse groups?**

Sota Inoue<sup>1</sup>, Colin Torney<sup>2</sup>, Shinya Yamamoto<sup>3</sup>, Monamie Ringhofer<sup>3</sup>, Renata Mendonça<sup>4</sup>, Satoshi Hirata<sup>1</sup>

*1 Wildlife Research Center, Kyoto Univ., Kyoto, Japan*

*2 School of Mathematics and Statistics, University of Glasgow, Glasgow, Scotland*

*3 Institute for Advanced Study, Kyoto university, Japan*

*4 Primates Research Institute, Kyoto university, Japan*

**P35 A deep-learning-based flexible pipeline for processing 3D whole brain imaging**

Chentao Wen<sup>1</sup>, Takuya Miura<sup>1</sup>, Yukako Fujie<sup>2</sup>, Takayuki Teramoto<sup>3</sup>, Takeshi Ishihara<sup>3</sup>, Koutarou D. Kimura<sup>1,2,4</sup>

*1 Graduate School of Science, Osaka Univ., Toyonaka, Osaka, Japan*

*2 RIKEN center for Advanced Intelligence Project, Tokyo, Japan*

*3 Department of Biology, Faculty of Sciences, Kyushu Univ., Fukuoka, Japan*

*4 Graduate School of Natural Sciences, Nagoya City Univ., Nagoya, Japan*

**P36 An unified method to analyze the behavioral states and features during animal's navigation by machine learning**

Shuhei J Yamazaki<sup>1</sup>, Kazuya Ohara<sup>2</sup>, Ken Yoda<sup>3</sup>, Takuya Maekawa<sup>2</sup>, Koutarou D. Kimura<sup>1,4</sup>

*1 Graduate School of Science, Osaka University, Toyonaka, Osaka, Japan*

*2 Department of Multimedia Engineering, Osaka University, Suita, Osaka, Japan*

*3 Graduate School of Environmental Studies, Nagoya University, Nagoya, Aichi, Japan*

*4 Graduate School of Natural Sciences, Nagoya City University, Nagoya, Aichi, Japan*

**P37 Auditory and visual virtual reality for the study on multisensory integration in insect navigation**

Noriyasu Ando<sup>1</sup>, Koki Makino<sup>1</sup>, Hisashi Shidara<sup>2</sup>, Naoto Hommaru<sup>3</sup>, Ryohei Kanzaki<sup>1</sup>, Hiroto Ogawa<sup>2</sup>

*1 Research Center for Advanced Science and Technology, Univ. of Tokyo, Meguro-ku, Tokyo, Japan*

*2 Department of Biological Sciences, Faculty of Science, Hokkaido Univ. Sapporo, Japan*

*3 Graduate School of Life Science, Hokkaido Univ. Sapporo, Japan*

**P38 Optogenetic intervention to parvalbumin-expressing interneurons in the motor cortex of behaving mice**

Kaoru Ide<sup>1</sup>, Kenta Kobayashi<sup>3</sup>, Fuyuki Karube<sup>2</sup>, Kazuya Ohara<sup>4</sup>, Takuya Maekawa<sup>4</sup>, Fumino Fujiyama<sup>2</sup>, Susumu Takahashi<sup>1</sup>

*1 Lab of Cognitive and Behavioral Neuroscience, Grad Sch of Brain Science, Doshisha Univ., Kyotanabe, Kyoto, Japan*

*2 Lab of Neural Circuitry, Grad Sch of Brain Science, Doshisha Univ., Kyotanabe, Kyoto, Japan*

*3 Sec Viral Vector Development, NIPS, Okazaki, Japan*

*4 Grad Sch of Information Science and Technology, Osaka Univ., Osaka, Japan*

**P39 The reconfigurable maze enables various tests to study neural mechanisms of spatial navigation**

Satoshi Hoshino, Kaoru Ide, Susumu Takahashi

*Lab of Cognitive and Behavioral Neuroscience, Grad Sch of Brain Science, Doshisha Univ., Kyotanabe, Kyoto, Japan*

**P40 Characterization of phonotactic behaviors in free-moving female crickets**

Hisashi Shidara<sup>1</sup>, Naoto Hommaru<sup>2</sup>, Noriyasu Ando<sup>3</sup>, Hiroto Ogawa<sup>1</sup>

*1 Department of Biological Sciences, Faculty of Science, Hokkaido Univ., Sapporo, Hokkaido, Japan*

*2 Graduate School of Life Science, Hokkaido Univ., Sapporo, Hokkaido, Japan*

*3 Research Center for Advanced Science and Technology, Univ. of Tokyo, Meguro-ku, Tokyo, Japan*

**P41 Functional neural circuits for the zebrafish foraging behavior**

Akira Muto

*Molecular and Developmental Biology, National Institute of Genetics, Mishima, Shizuoka, Japan*

**P42 Simultaneous measurement of whole-brain activity and behavior toward comprehensive understanding of salt chemotaxis of *C. elegans***

Yu Toyoshima<sup>1</sup>, Ken Sato<sup>1</sup>, Hideharu Mikami<sup>2</sup>, Stephen Wu<sup>3</sup>, Hirofumi Sato<sup>1</sup>, Moon-Sun Jang<sup>1</sup>, Manami Kanamori<sup>1</sup>, Suzu Oe<sup>4</sup>, Takayuki Teramoto<sup>4</sup>, Terumasa Tokunaga<sup>3,5</sup>, Osamu Hirose<sup>6</sup>, Keisuke Goda<sup>2</sup>, Takeshi Ishihara<sup>4</sup>, Ryo Yoshida<sup>3</sup>, Yuichi Iino<sup>1,7</sup>

*1 Department of Biological Sciences, Graduate School of Science, The University of Tokyo, Bunkyo-ku, Tokyo, Japan*

*2 Department of Chemistry, Graduate School of Science, The University of Tokyo, Bunkyo-ku, Tokyo, Japan*

*3 The Institute of Statistical Mathematics, Research Organization of Information and Systems, Tachikawa, Tokyo, Japan*

*4 Department of Biology, Faculty of Sciences, Kyushu University, Higashi-ku, Fukuoka, Japan*

*5 Department of Systems Design and Informatics, Faculty of Computer Science and Systems Engineering, Kyushu Institute of Technology, Iizuka-shi, Fukuoka, Japan*

*6 Faculty of Electrical and Computer Engineering, Institute of Science and Engineering, Kanazawa University, Kakuma, Kanazawa, Japan*

*7 CREST, Japan Science and Technology Corporation, Bunkyo-ku, Tokyo, Japan*

**P43 The Hippocampal Engram Maps Experience But Not Place**

Kazumasa Z. Tanaka<sup>1</sup>, Hongshen He<sup>1,2</sup>, Anupratap Tomar<sup>1</sup>, Kazue Niisato<sup>1</sup>, Arthur J.Y. Huang<sup>1</sup>, Thomas J. McHugh<sup>1,2</sup>

*1 Laboratory for Circuit and Behavioral Physiology, RIKEN Brain Science Institute, 2-1 Hirosawa, Wakoshi, Saitama, Japan*

*2 Department of Life Sciences, Graduate School of Arts and Sciences, University of Tokyo, Tokyo, Japan*

**P44 Analyses of the mechanisms of information processing controlling behavior by whole-brain imaging in *C. elegans***

Suzu Oe<sup>1</sup>, Yuko Murakami<sup>1</sup>, Yuki Kawahara<sup>1</sup>, Takayuki Teramoto<sup>1</sup>, Yu Toyoshima<sup>2</sup>, Terumasa Tokunaga<sup>4</sup>, Stephan Wu<sup>3</sup>, Osamu Hirose<sup>5</sup>, Jang Moon-Sun<sup>2</sup>, Hirofumi Sato<sup>2</sup>, Hiroki Takizawa<sup>2</sup>, Sayuri Kuge<sup>1</sup>, Yuishi Iwasaki<sup>6,7</sup>, Ryo Yoshida<sup>3,7</sup>, Yuichi Iino<sup>2,7</sup>, Takeshi Ishihara<sup>1,7</sup>

*1 Dept of Biology, Fac of Sciences, Kyushu Univ.*

*2 Dept of Biological Sciences, Grad Sch of Sciences, Univ. of Tokyo*

*3 Inst of Statistical Mathematics, Research Organization of Information and Systems*

*4 Dept of Systems Design and Informatics, Fac of Computer Science and Systems Engineering, Kyushu Inst of Technology*

*5 Fac of Electrical and Computer Engineering, Inst of Science and Engineering, Kanazawa Univ.*

*6 Dept of Intelligent System Engineering, Ibaraki Univ.*

*7 CREST*

**P45 Hippocampus-dependent goal localization by head-fixed mice in virtual reality**

Masaaki Sato<sup>1,2,3</sup>, Masako Kawano<sup>3</sup>, Kotaro Mizuta<sup>4</sup>, Tanvir Islam<sup>3</sup>, Min Goo Lee<sup>5</sup>, Yasunori Hayashi<sup>4</sup>

*1 Grad. Sch. Sci. Eng., Saitama Univ., Saitama, Japan*

*2 Brain and Body System Science Institute, Saitama University, Saitama, Japan*

*3 RIKEN Center for Brain Science, Wako, Saitama, Japan.*

*4 Dept Pharmacol., Kyoto Univ. Grad. Sch. Med., Kyoto, Japan.*

*5 Dept. Pharmacol., Pharmacogenomic Res. Center for Membrane Transporters, Yonsei Univ. Col. Med., Seoul, Republic of Korea.*

**P46 Attempts to reveal the mechanisms of locomotor neural circuit for prey capture**

Shinichi Higashijima<sup>1</sup>, Nozomi Nishiumi<sup>2</sup>

*1 Exploratory Research Center on Life and Living Systems, Aichi, Japan*

*2 National Institute for Basic Biology, Aichi, Japan*

**P47 Large-scale extracellular recording to uncover the mechanism of generating spatial coding in the hippocampus**

Takuma Kitanishi<sup>1,2</sup>, Kenji Mizuseki<sup>1,2</sup>

*1 Department of Physiology, Osaka City University Graduate School of Medicine, Osaka, Japa*

*2 Center for Brain Science, Osaka City University Graduate School of Medicine, Osaka, Japan*