

CURRICULUM VITAE

April 1, 2018

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EDUCATION

| <i>Degree</i> | <i>Institute</i> | <i>Year</i> |
|---------------|-------------------------------------------------------------------|-------------|
| Ph.D. | Department of Multidisciplinary Studies, University of Tokyo | 1997 |
| M.S. | Department of Multidisciplinary Studies, University of Tokyo | 1992 |
| B.A. | Department of Natural and Artificial Systems, University of Tokyo | 1990 |

RESEARCH EXPERIENCE

| <i>Position</i> | <i>Institute</i> | <i>Period</i> |
|--------------------------------------------|---------------------------------------------------------------------------------------------|-----------------|
| Team Leader | RIKEN Center for Brain Science <i>Laboratory for Integrated Theoretical Neuroscience</i> | 04/2018–present |
| Senior Team Leader | RIKEN Brain Science Institute <i>Laboratory for Integrated Theoretical Neuroscience</i> | 04/2014–03/2018 |
| Team Leader | RIKEN Brain Science Institute <i>Laboratory for Integrated Theoretical Neuroscience</i> | 01/2006–03/2014 |
| Staff Scientist | RIKEN Brain Science Institute <i>Laboratory for Mathematical Neuroscience</i> | 04/2005–12/2005 |
| Research Scientist | RIKEN Brain Science Institute <i>Laboratory for Mathematical Neuroscience</i> | 04/2000–03/2005 |
| Special Postdoctoral Researcher | RIKEN Brain Science Institute <i>Laboratory for Information Synthesis</i> | 04/1997–03/2000 |
| Visiting Graduate | University of California, San Diego <i>Department of Cognitive Science</i> | 12/1993–04/1996 |

TEACHING EXPERIENCE (Selected)

| <i>Position</i> | <i>Institute</i> | <i>Period</i> |
|--------------------------|------------------|-----------------|
| Adjunct Professor | Kyoto University | 06/2015–present |

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|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------|
| | <i>Graduate School of Informatics, Department of Intelligence Science and Technology</i> | |
| Visiting Lecturer | Tokyo Medical and Dental University | 04/2013–03/2015 |
| | <i>Graduate School of Medical and Dental Sciences</i> | |
| Adjunct Professor | Tokyo Institute of Technology | 10/2007–03/2012 |
| | <i>Interdisciplinary Graduate School of Science and Engineering, Department of Computational Intelligence and Systems Science</i> | |
| Visiting Lecturer (Professor status) | Waseda University | 09/2007–07/2009 |
| | <i>Department of Life Science and Medical Bioscience</i> | |
| Visiting Associate Professor | Japan Advanced Institute of Science and Technology | 10/2000–03/2003 |
| | <i>Department of Knowledge System Science, School of Knowledge Science</i> | |
| Visiting Lecturer | Meiji University | 04/1998–03/2001 |
| | <i>Graduate School of Science and Technology</i> | |
| Teaching Assistant | University of Tokyo | 09/1992–09/1993 |
| | <i>Department of Natural and Artificial Systems</i> | |

AWARDS and FELLOWSHIPS (Selected)

| <i>Award/Fellowship</i> | <i>Organization</i> | <i>Year/Period</i> |
|------------------------------------------------|-----------------------------------------------------------------|--------------------|
| Young Investigator Award | Japan Neuroscience Society | 2004 |
| Special Postdoctoral Fellowship | RIKEN | 1997–2000 |
| JSPS Research Fellowship | Japan Society for the Promotion of Science for Young Scientists | 1996–1997 |
| Rotary International Ambassadorial Scholarship | Rotary One Foundation | 1994–1995 |
| Study Abroad Fellowship | University of Tokyo | 1993–1994 |

SERVICES (Selected)

| <i>External</i> | <i>Year/Period</i> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| The Japanese Society for Artificial Intelligence, Council member | 2017/04–present |
| Human Imaging Study Group (in Japan), Committee member | 2017/04–present |
| RLDM2017 (The University of Michigan, Ann Arbor, Michigan, USA) Program (Reviewing) Committee member | 2017–present |
| A section writer for the report “Panoramic View of the Systems and Information Science and Technology Field (2017)” by Center for Research and Development Strategy Japan Science and Technology Agency | 2016 |
| A guest talk and discussion on artificial intelligence and a brain science for a meeting of Ministry of Internal Affairs and Communications | 2016/04 |
| The 40th Annual Meeting of the Japan Neuroscience Society, Program Committee member | 2016–2017 |

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| RLDM2015 (The University of Alberta., Edmonton, Alberta, Canada), Program (Reviewing) Committee member | 2015 |
| Mechanism of Brain and Mind Workshop, Deputy Chair | 2015–present |
| Mechanism of Brain and Mind Workshop, Planning Committee | 2014–2015 |
| The 21st International Conference on Neural Information Processing (Kuching, Sarawak, Malaysia) Program Committee | 2014 |
| Shonan meeting ("Deep Learning: Theory, Algorithms, and Applications"), Neurobiology section chair | 2014 |
| RLDM2013 (the 1st Multidisciplinary Conference on Reinforcement Learning and Decision Making; Princeton Univ., New Jersey, USA), Program (Reviewing) Committee member | 2013 |
| The 20th International Conference on Neural Information Processing (Daegu, Korea) Program member | 2013 |
| International workshop "Modeling Neural Activity: Statistics, Dynamical Systems, and Networks" (Hawaii, USA) Co-organizer | 2013/06 |
| Board Member of the Japanese Neural Network Society | 2013–2017 |
| 1st-stage Referee for Grant-in-Aids for Scientific Research and for Young Scientists in the field, Basic / Social brain science | 2012–2013, 2013–2014 |
| Symposium Organizer ("Functional architecture of collective neural activities and their networks: new advances in experimental and theoretical approaches"), Japanese Neuroscience Society Meeting | 2012 |
| Fellowship Review Committee Member for the Human Frontier Science Program | 2011–2012 |
| Symposium Organizer ("New perspectives on value-based decision making"), Japanese Neuroscience Society Meeting | 2010 |
| 1st-stage Referee for doctoral/postdoctoral fellowships by Japan Society for The Promotion Science (JSPS) | 2010–2011 |
| 1st-stage Referee for Grant-in-Aid for Scientific Research on Innovative Areas (Research in a Proposed Research Project) | 2009 |
| Planning Group Member (Medical/Neuroscience Section), the 3rd Japanese-French Frontiers of Science Symposium | 2009 |
| Co-organizer of the International Workshop "Open Problems in Neuroscience of Decision Making," OIST, Okinawa | 2008 |
| Editor for <i>Neural Networks</i> | 2003–2005, 2008–present |
| Editor for <i>Biological Cybernetics</i> | 2007–2017 |
| Editor for <i>Computational Intelligence and Neuroscience</i> | 2006–present |
| Committee member of the Neurocomputing Technical Group, Information and Systems Society, The Institute of Electronics, Information, and Communication Engineers | 2002–2008 |
| Assistant Secretary of the Neurocomputing Technical Group, Information and Systems Society, The Institute of Electronics, Information, and Communication Engineers | 2000–2002 |

Internal (RIKEN Brain Science Institute, or related to RIKEN)

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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| Organizing a summer school (domestic in Japan) on artificial intelligence and brain science at RIKEN BSI, under a grant group organization (“Correspondence and Fusion of Artificial Intelligence and Brain Science”) | 08/2017 (planned) |
| Preparation Member for RIKEN BSI—Omron Collaboration Center | 12/2016–present |
| 3 rd BSI panel talk session in 20 th anniversary memorial event (public event) | 11/2016 |
| Brain Science Café talk (public lecture on a RIKEN open day) | 04/2016 |
| Member for BSI Future Strategic Planning Discussion Group | 05/2015–02/2016 |
| Organizing mini-symposium series on Cognition, Decision-making and Social function (2014/10, 2015/01, 2015/04, 2016/10) | 2014–present |
| Organizing mini-symposium series on Computations, Brains and Machines (2014/07, 2015/07, 2016/03, 2016/07) | 2014–present |
| Brain Science Training Program lecture | 2012, 2013, 2014, 2015, 2016 |
| Referee Member for "Special Postdoctoral Researchers" fellowships | 2007 |
| BSI International Summer School lecture (BSI lecture) | 2006, 2012 |
| BSI Tutorial Series lecture | 2006, 2007, 2008 |
| BSI Retreat Organizing Committee | 2001, 2010, 2011 |
| BSI International Summer School, Organizing Committee Member | 2000 |

JOURNAL PUBLICATIONS

Kass RE, Amari S, . . . , **Nakahara H**, . . . , Kramer MA. [25 authors in total] (2018) Computational neuroscience: Mathematical and statistical perspectives. *Annual Review of Statistics and Its Application*. 5: 183-214.

Terada S, Sakurai Y, **Nakahara H**, Fujisawa S. (2017) Temporal and rate coding for discrete event sequences in the hippocampus. *Neuron*. 94(6): 1248-1262.

Kaveri S, **Nakahara H**. (2014) Dual reward prediction components yield pavlovian sign- and goal-tracking. *Plos One*. 9(10): e108142.

Nakahara H. (2014) Multiplexing signals in reinforcement learning with internal models and dopamine. *Current Opinion in Neurobiology*. 25: pp.123-129.

Kim CH, Tsujino H, **Nakahara H**. (2013) Reinforcement learning system based on heuristics free state focusing. *Advanced Robotics*. 27(10): 749-758.

Nakamura K, Santos GS, Matsuzaki R, **Nakahara H**. (2012) Differential reward coding in the subdivisions of the primate caudate during an oculomotor task. *The Journal of Neuroscience*. 32(45): 15963–15982.

Nakahara H, Hikosaka O. (2012) Learning to represent reward structure: a key to adapting to complex environments. *Neuroscience Research*. 74(3-4): 177–183.

Suzuki S, Harasawa H, Ueno K, Gardner JL, Ichinohe N, Haruno M, Cheng K, **Nakahara H**. (2012) Learning to simulate others’ decisions. *Neuron*. 74: 1125–1137.

- Santos GS, Nagasaka Y, Fujii N, **Nakahara H**. (2012) Encoding of social state information by neuronal activities in the macaque caudate nucleus. *Social Neuroscience*. 7(1): 42–58.
- Yu S, Yang H, **Nakahara H**, Santos GS, Nikolić D, Plenz D. (2011) Higher-order interactions characterized in cortical activity. *The Journal of Neuroscience*. 31(48): 17514–17526.
- Nakahara H**, Kaveri S. (2010) Internal-time temporal difference model for neural value-based decision making. *Neural Computation*. 22(12): 3062–3106.
- Bromberg-Martin ES, Matsumoto M, **Nakahara H**, Hikosaka O. (2010) Multiple timescales of memory in lateral habenula and dopamine neurons. *Neuron*. 67(3): 499–510.
- Santos GS, Gireesh ED, Plenz D, **Nakahara H**. (2010) Hierarchical interaction structure of neural activities in cortical slice cultures. *The Journal of Neuroscience*. 30(26): 8720–8733.
- Bissmark F, **Nakahara H**, Doya K, Hikosaka O. (2008) Combining modalities with different latencies for optimal motor control. *Journal of Cognitive Neuroscience*. 20(11): 1966–1979.
- Plessy C, Fagiolini M, Wagatsuma A, Harasawa N, Kuji T, Asaka-Obam A, Kanzaki Y, Fujishima S, Waki K, **Nakahara H**, Hensch TK, Carninci P. (2008) A resource for transcriptomic analysis in the mouse brain. *PLoS ONE*. 3(8): e3012.
- Takenaka K, Nagasaka Y, Hihara S, **Nakahara H**, Iriki A, Kuniyoshi Y, Fujii N. (2007) Linear discrimination analysis of monkey behavior in an alternative free choice task. *Journal of Robotics and Mechatronics*. 19(4): 416–422.
- Nakahara H**, Nakamura K, Hikosaka O. (2006) Extended LATER model can account for trial-by-trial variability of both pre- and post-processes. *Neural Networks*. 19(8): 1027–1046.
- Nakahara H**, Morita K, Wurtz RH, Optican LM. (2006) Saccade-related spread of activity across superior colliculus may arise from asymmetry of internal connections. *Journal of Neurophysiology*. 96(2): 765–774.
- Amari S, **Nakahara H**. (2006) Correlation and independence in the neural code. *Neural Computation*. 18(6): 1259–1267.
- Hikosaka O, Nakamura K, **Nakahara H**. (2006) Basal ganglia orient eyes to reward. *Journal of Neurophysiology*. 95(2): 567–584.
- Nakahara H**, Amari S, Richmond BJ. (2006) A comparison of descriptive models of a single spike train by information-geometric measure. *Neural Computation*. 18(3): 545–568.
- Nelson B, Nishimura S, Kanuka H, Kuranaga E, Inoue M, Hori G, **Nakahara H**, Miura M. (2005) Isolation of gene sets affected specifically by polyglutamine expression: Implication of the TOR signaling pathway in neurodegeneration. *Cell Death and Differentiation*. 12(8): 1115–1123.
- Amari S, **Nakahara H**. (2005) Difficulty of singularity in population coding. *Neural Computation*. 17(4): 839–858.
- Inoue M, Nishimura S, Hori G, **Nakahara H**, Saito M, Yoshihara Y, Amari S. (2004) Improved parameter estimation for variance-stabilizing transformation of gene-expression microarray data. *Journal of Bioinformatics and Computational Biology*. 2(4): 669–679.

- Wu S, Amari S, **Nakahara H**. (2004) Information processing in a neuron ensemble with the multiplicative correlation structure. *Neural Networks*. 17(2): 205–214.
- Nakahara H**, Itoh H, Kawagoe R, Takikawa Y, Hikosaka O. (2004) Dopamine neurons can represent context-dependent prediction error. *Neuron*. 41(2): 269–280.
- Kasai H, Matsuzaki M, Noguchi J, Yasumatsu N, **Nakahara H**. (2003) Structure-stability-function relationships of dendritic spines. *Trends in Neurosciences*. 26(7): 360–368.
- Nakahara H**, Nishimura S, Inoue M, Hori G, Amari S. (2003) Gene interaction in DNA microarray data is decomposed by information geometric measure. *Bioinformatics*. 19(9): 1124–1131.
- Itoh H, **Nakahara H**, Hikosaka O, Kawagoe R, Takikawa Y, Aihara K. (2003) Correlation of primate caudate neural activity and saccade parameters in reward-oriented behavior. *Journal of Neurophysiology*. 89(4): 1774–1783.
- Amari S, **Nakahara H**, Wu S, Sakai Y. (2003) Synchronous firing and higher-order interactions in neuron pool. *Neural Computation*. 15(1): 127–142.
- Nakahara H**, Amari S. (2002) Information geometric measure for neural spikes. *Neural Computation*. 14(10): 2269–2316.
- Wu S, Amari S, **Nakahara H**. (2002a) Asymptotic behaviors of population codes. *Neurocomputing*. 44-46: 697–702.
- Wu S, Amari S, **Nakahara H**. (2002b) Population coding and decoding in a neural field: a computational study. *Neural Computation*. 14(5): 999–1026.
- Takikawa Y, Kawagoe R, Ito H, **Nakahara H**, Hikosaka O. (2002) Modulation of saccadic eye movements by predicted reward outcome. *Experimental Brain Research*. 142(2): 284–291.
- Nakahara H**, Amari S, Hikosaka O. (2002) Self-organization in the basal ganglia with modulation of reinforcement signals. *Neural Computation*. 14(4): 819–844.
- Nakahara H**, Amari S. (2002) Attention modulation of neural tuning through peak and base rate in correlated firing. *Neural Networks*. 15(1): 41–55.
- Hikosaka O, Nakamura K, Sakai K, **Nakahara H**. (2002) Central mechanisms of motor skill learning. *Current Opinion in Neurobiology*. 12(2): 217–222.
- Nakahara H**, Wu S, Amari S. (2001) Attention modulation of neural tuning through peak and base rate. *Neural Computation*. 13(9): 2031–2047.
- Wu S, **Nakahara H**, Amari S. (2001) Population coding with correlation and an unfaithful model. *Neural Computation*. 13(4): 775–797.
- Nakahara H**, Doya K, Hikosaka O. (2001) Parallel cortico-basal ganglia mechanisms for acquisition and execution of visuomotor sequences - a computational approach. *Journal of Cognitive Neuroscience*. 13(5): 626–647.
- Hikosaka O, **Nakahara H**, Rand MK, Sakai K, Lu X, Nakamura K, Miyachi S, Doya K. (1999) Parallel neural networks for learning sequential procedures. *Trends in Neurosciences*. 22(10): 464–471.

Nakahara H, Doya K. (1998) Near-saddle-node bifurcation behavior as dynamics in working memory for goal-directed behavior. *Neural Computation*. 10(1): 113–132.

BOOK CHAPTERS

Dayan P, **Nakahara H**. (in press) Models and Methods for Reinforcement Learning. *The Stevens' Handbook of Experimental Psychology*. Volume 5.

Sugiyama M, **Nakahara H**, Tsuda K. (2017) Tensor balancing on statistical manifold. *ICML2017* .

Bissmarck F, **Nakahara H**, Doya K, Hikosaka O. (2005) Responding to modalities with different latencies. In: Saul K, Weiss Y, Bottou L (Ed.), *Advances in Neural Information Processing*. 17: 169–176. Cambridge, MA: MIT Press.

Saïdo T, **Nakahara H**. (2003) Proteolytic degradation of A β by neprilysin and other peptidases. In T Saïdo (Ed.), *A β Metabolism and Alzheimer's Disease*. 61–80. Georgetown, TX: Landes Bioscience.

Nakahara H, Amari S. (2002) Information-geometric decomposition in spike analysis. In TG Dietterich, S Becker, Z Ghahramani (Eds.), *Advances in Neural Information Processing Systems*. 14: 253–260. Cambridge, MA: MIT Press.

Wu S, **Nakahara H**, Murata N, Amari S. (2000) Population decoding based on an unfaithful model. In SA Solla, TK Leen, and K Mueller (Eds.), *Advances in Neural Information Processing Systems*. 12: 192–198. Cambridge, MA: MIT Press.

Hikosaka O, Sakai K, **Nakahara H**, Lu X, Miyachi K, Nakamura K, Rand MK. (2000) Neural mechanisms for learning of sequential procedures. In MS Gazzaniga (Ed.), *The New Cognitive Neurosciences*. 553–572. Cambridge, UK: MIT Press.

Ikeda S, Amari S, **Nakahara H**. (1999) Convergence of the wake-sleep algorithm. In MS Kearns, SA Solla, DA Cohn (Eds.), *Advances in Neural Information Processing Systems*. 11: 239–245. Cambridge, MA: MIT Press.

Nakahara H, Doya, K. (1996) Dynamics of attention as near saddle-node bifurcation behavior. In DS Touretzky, MC Mozer, ME Hasselmo (Eds.), *Advances in Neural Information Processing Systems*. 8: 38–44. Cambridge, MA: MIT Press.

[Japanese publications, including articles for periodicals and the general public]

Nakahara H. (2017) Neural Computations Underlying Social Intelligence: Towards Realization of the Artificial Intelligence. *Journal of Japanese Society for Artificial Intelligence*. No. 32(6): pp.863-872.

Nakahara H. (2016) Neural computations for mind, emotion and social intelligence. *Human Mind*. Special issue 2016: 146-150. Tokyo, Japan: Hippon Hyron Sha co., Ltd.

Nakahara H. (2015) Reading others' minds: pursuit of social brain functions from computational perspective. *Seitai no Kagaku*. No. 66(1): 48-52. Tokyo, Japan: The Ichiro Kanehara Foundation for the Promotion of Medical Sciences and Medical Care.

Nakahara H. (2014) Perspective for neurobiology of others' minds: computational social neuroscience. *Seitai no Kagaku*. No. 65(5): 420-421. Tokyo, Japan: The Ichiro Kanehara Foundation for the Promotion of Medical Sciences and Medical Care.

- Nakahara H.** (2014) Computational theory of brain function: reinforcement learning and value-based decision-making. *Clinical Neuroscience*. No.32(1): 20-24. Tokyo, Japan: CHUGAI-IGAKUSHA.
- Nakahara H.** (2013) Social decision-making and theoretical neuroscience: prospects for human sciences and computational psychiatry. *Seitai no Kagaku*. No.64(4): 322–328. Tokyo, Japan: The Ichiro Kanehara Foundation for the Promotion of Medical Sciences and Medical Care.
- Nakahara H.** (2013) Reward structural learning by dopamine activity. *Brain & Nerve*. No.65(8): 973–982. Tokyo, Japan: Igaku-Shoin.
- Nakahara H.** (2011) Love as neural computation: from the perspective of value-based decision making. *Science Journal KAGAKU*. 81(1): 58–63. Tokyo, Japan: Iwanami Shoten.
- Nakahara H.** (2010) Computations and mathematics on neural networks. In S Kanba and T Kato (Eds.), *Brain Science Essentials: for the Biological Understanding of Mental Disease — Lumiere for Clinicians on Mental Disease as Medical Specialist vol 16*. 303–304. Tokyo, Japan: Nakayama Shoten.
- Nakahara H.** (2009) Population coding. In H Hironaka et al (Eds.), *Encyclopedia of Modern Mathematical Sciences (2nd Edition)*. 313–315. Tokyo, Japan: Maruzen Publishing.
- Nakahara H.** (2009) Decision making and its learning theory (Chapter 5). In S Amari, T Fukai (Eds.), *Computational Theories of the Brain (Brain Science series vol 1)*. 159–221. Tokyo, Japan: University of Tokyo Press.
- Nakahara H.** (2008) Computational models of the basal ganglia: reinforcement learning for reward prediction and acquisition. *Japanese Journal of Molecular Psychiatry*. 8(4): 307–313. Tokyo, Japan: Sentan Igaku-sya.
- Nakahara H.** (2007) Pleasure forms the brain (Chapter 11). In RIKEN BSI (Ed.), *Frontiers of Neuroscience Research (vol 2)*. 233–297. Tokyo, Japan: Kodansya.
- Nakahara H.** (2006) Inferring brain networks and gene networks. *Brain* 21. 9(3): 11–20. Kyoto, Japan: Kinpodo.
- Nakahara H.** (2005) Function of neurons and neural networks. In The Japanese Society for Artificial Intelligence (Ed.), *Encyclopedia of Artificial Intelligence*. 153–155. Tokyo, Japan: Kyoritsu Shuppan.
- Nakahara H.** (2005) Development and neural plasticity. In The Japanese Society for Artificial Intelligence (Ed.), *Encyclopedia of Artificial Intelligence*. 164–165. Tokyo, Japan: Kyoritsu Shuppan.
- Nakahara H.** (2005) Computational models of the basal ganglia (Chapter 11). In K Doya, H Gomi, Sakaguchi, and M Kawato (Eds.), *Computational Mechanisms of the Brain*. 140–161. Tokyo, Japan: Asakura Publishing.
- Nakahara H.** (2005) Dopamine activity for the appetitive system, as reinforcement learning signals. *Seitai no Kagaku*. 56(1): 17–25. Tokyo, Japan: IGAKU-SHOIN Ltd.
- Nakahara H.** (2005) Population coding, spike analysis and information geometry. *Mathematical Sciences*. 3(501): 32–38. Tokyo, Japan: Saiensu-sya.
- Nakahara H, Hori G, Inoue M, & Nishimura S.** (2002) Mathematical neuroscience and its relationship to gene data analysis. In S Amari (Ed.), *Progress in Neural Information and Mathematical Sciences (Mathematical Sciences separate volume)*. 133–143. Tokyo, Japan: Saiensu-sya.

Nakahara H, Doya K, Hikosaka O. (2000) Computational theories of cortico-basal ganglia systems. *Brain* 21. 3(3): 29–34. Kyoto, Japan: Kinpodo.

Nakahara H, Doya K, Hikosaka O. (2000) Brain global networks for learning motor sequence control. *Brain Science*. 22(10): 101–111. Tokyo, Japan: Seiwa Shoten.

INVITED LECTURES /TALKS /SYMPOSIA (Selected)

| <i>Date</i> | <i>Location</i> |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10/2017 | The 44th Naito Conference “Sciences of Decision Making: Motivation, Prediction and Neural plasticity”, Sapporo, Japan. |
| 09/2017 | The 11th International Conference on Cognitive Science (ICCS 2017), Taipei, Taiwan. |
| 08/2017 | Summer School for Artificial Intelligence and Brain Science, RIKEN BSI, Wako, Japan (<i>in Japanese</i>). |
| 07/2017 | AI-Brain Workshop, Shanghai, China. |
| 06/2017 | Workshop “Deep Learning: Theory, Algorithms, and Applications”, Berlin, Germany. |
| 05/2017 | The Seventh International Symposium on “Biology of Decision Making” (SBDM), Bordeaux, France. |
| 05/2017 | Gatsby-Kaken Joint Workshop on AI and Neuroscience, London, Britain. |
| 12/2016 | Workshop “Arrowhead 10 years on: what have we learned and what is there still to learn about the neural bases of decision-making?” Sydney, Australia. |
| 11/2016 | Kyoto University, Graduate School of Medicine and Faculty of Medicine, Kyoto, Japan (<i>in Japanese</i>). |
| 06/2016 | Workshop “Modeling Neural Activity: Statistics, Dynamical Systems, and Networks (MONA-2)”, Hawaii, USA. |
| 11/2015 | University of Oxford, Department of Experimental Psychology, Oxford, UK. |
| 11/2015 | University College London, Max Planck UCL Centre for Computational Psychiatry and Ageing Research, London, UK. |
| 10/2015 | SAMSI-Boston University Workshop “Challenges in Linking Statistical and Mathematical Neuroscience 2015”, Boston, USA. |
| 07/2015 | Meeting by a chapter of the System and Information division, the Society of Instrument and Control Engineers (SICE), Tokyo, Japan (<i>in Japanese</i>). |
| 05/2015 | Kyoto University, Graduate School of Medicine and Faculty of Medicine, Kyoto, Japan (<i>in Japanese</i>). |
| 12/2014 | The Joint Symposium by “Prediction and Decision Making” & “The Science of the Mental Time,” Grant-in Aid for Scientific Research on Innovative Areas, Tokyo, Japan (<i>in Japanese</i>). |
| 11/2014 | Autumn School for Computational Neuroscience (ASCONE2014), Nagano, Japan (<i>in Japanese</i>). |
| 09/2014 | Workshop “One, two, and many brains”, Lisbon, Portugal. |
| 07/2014 | OIST Computational Neuroscience Course (OCNC2014), Okinawa, Japan. |

- 05/2014 NII Shonan Meeting “Deep Learning: Theory, Algorithms, and Applications,” Kanagawa, Japan.
- 05/2014 National Yang-Ming University, Institute of Neuroscience, Taipei, Taiwan.
- 04/2014 National Taiwan University, Department of Economics, Taipei, Taiwan.
- 01/2014 Winter workshop “Mechanisms of Brain and Mind,” Hokkaido, Japan.
- 10/2013 International Symposium “Prediction and Decision Making,” Kyoto, Japan.
- 06/2013 Workshop “Modeling Neural Activity: Statistics, Dynamical Systems, and Networks,” Hawaii, USA.
- 06/2013 Tokyo Study Meeting on Clinical Brain Imaging, Tokyo, Japan.
- 05/2013 The University of Tokyo, Graduate School of Economics, Tokyo, Japan.
- 04/2013 BSI Brain Science Training Program, RIKEN Brain Science Institute, Wako, Japan.
- 03/2013 Workshop “Reward and Decision Making on Risk and Aversion” (in conjunction with Joint Tamagawa-Caltech Lecture Course 2013), Hawaii, USA.
- 02/2013 Memorial Symposium for Dr. Shun-ichi Amari as a Person of Cultural Merit at the University of Tokyo, Tokyo, Japan.
- 01/2013 The University of Tokyo, Graduate School of Arts and Science, Tokyo, Japan.
- 11/2012 California Institute of Technology, Division of Humanities & Social Sciences, Pasadena, USA.
- 11/2012 Stanford University, Department of Psychology, San Francisco, USA.
- 11/2012 Kyoto University, Department of Systems Science, Graduate School of Informatics, Integrated Systems Biology, Kyoto, Japan.
- 09/2012 Symposium “Functional architecture of collective neural activities and their networks: new advances in experimental and theoretical approaches,” Japanese Neuroscience Society Meeting (Neuro2012), Nagoya, Japan.
- 11/2011 Columbia University, Center for Theoretical Neuroscience, New York, USA.
- 11/2011 New York University, Center for Neural Science, New York, USA.
- 04/2011 University of Oxford, Department of Experimental Psychology, Oxford, UK.
- 04/2011 University College London, Gatsby Computational Neuroscience Unit, London, UK.
- 04/2011 University College London, Wellcome Trust Centre for Neuroimaging (*Emotion Club Seminar*), London, UK.
- 04/2011 Workshop on Geometric and Algebraic Statistics 3, University of Warwick, Coventry, UK.
- 11/2010 California Institute of Technology, Division of Biology (*Shimojo Psychophysics Laboratory Seminar*), Pasadena, USA.
- 10/2010 10th China-India-Japan-Korea Joint Workshop on Neurobiology and Neuroinformatics (NBNI 2010), Kunming, China.
- 09/2010 Symposium “New perspectives on value-based decision making,” Japanese Neuroscience Society Meeting (Neuro2010), Kobe, Japan.
- 08/2010 Bernstein Center for Computational Neuroscience, Berlin, Germany.
- 08/2010 Information Geometry and Its Applications III, Leipzig, Germany.

- 02/2010 Reward and Decision Making Batsheva Conference, Jerusalem, Israel.
- 05/2009 Waseda University, Institute for Research in Contemporary Political and Economic Affairs (Waseda Monday Seminar), Tokyo, Japan (*in Japanese*).
- 02/2009 Neuro Social Science Workshop, Osaka, Japan.
- 12/2008 EPSRC Workshop on Computational Neuroscience, University of Warwick, Birmingham, UK.
- 12/2008 RIKEN BSI Tutorial Series 2008, RIKEN BSI, Wako, Japan.
- 10/2008 Open Problems in Neuroscience of Decision Making, OIST Seaside House, Okinawa, Japan.
- 09/2008 Human Forum 2008, Honda Research Institute, Wako, Japan (*in Japanese*).
- 07/2008 The 3rd APCTP-KAIST Summer School for Brain Dynamics, Korea Advanced Institute of Science and Technology, Daejeon, South Korea.
- 01/2008 HFSP International Workshop on Neural Control of Attention, Perception, and Learning, OIST, Okinawa, Japan.
- 01/2008 University College London, Gatsby Computation Neuroscience Unit, London, UK.
- 01/2008 Paris College de France, Institut des Science Cognitives, Paris, France.
- 01/2008 The 2nd Japanese-French Frontiers of Science Symposium, Station Biologique, Roscoff, France.
- 01/2008 RIKEN BSI Tutorial Series 2007, RIKEN BSI, Wako, Japan.
- 11/2007 RIKEN BSI-MIT Picower Workshop 2007 (talk shared with Dr. N. Fujii), RIKEN BSI, Wako, Japan.
- 10/2007 Preparation Meeting for Japanese-French Frontiers of Science Symposium, Tokyo, Japan.
- 10/2007 Korea Advanced Institute of Science and Technology, Department of Bio and Brain Engineering, Daejeon, Korea.
- 10/2007 NIPS Workshop on Neural Mechanisms for Attention and Decision Making, National Institute for Physiological Sciences, Okazaki, Japan (*in Japanese*).
- 07/2007 International Conference Stochastic Processes and Applications (ICSPA 2007), Indian Institute of Science, Bangalore, India.
- 07/2007 Workshop on Mathematical Aspects of Neuroscience, Indian Institute of Science, Bangalore, India (two talks).
- 06/2007 The 3rd Technical Committee on Brain Communication, Tokyo, Japan (*in Japanese*).
- 04/2007 21st Century COE Program Center for Evolutionary Cognitive Sciences, The University of Tokyo, Tokyo, Japan (*in Japanese*).
- 03/2007 Spring School in Computational Neuroscience, Shanghai, China.
- 12/2006 NIPS Workshop on Neural Mechanisms with Cerebral Cortical Units, National Institute for Physiological Sciences, Okazaki, Japan (*in Japanese*).
- 11/2006 RIKEN BSI Tutorial Series 2006, RIKEN BSI, Wako, Japan.
- 11/2006 The 5th Study Meeting for “Neural mechanisms and computational processes for human motor control and language acquisition,” Kyoto University, Kyoto, Japan (*in Japanese*).
- 08/2006 RIKEN BSI International Summer School, RIKEN BSI, Wako, Japan.
- 07/2006 2006 “Wings of Mathematical Science” Workshop, Tokyo, Japan (*in Japanese*).

- 05/2006 RIKEN Joint Retreat, Shizuoka, Japan.
- 11/2004 Special Session, International Symposium on Nonlinear Theory and its Applications, Fukuoka, Japan.
- 09/2004 The US-Japan Brain Research Collaborative Program Workshop on Bioinformatic Analysis of Brain Function, Hawaii, USA.
- 09/2004 Symposium “Neural correlates of action selection based on reward and goal,” Japanese Neuroscience Society Meeting (Neuro2004), Osaka, Japan.
- 05/2004 Advanced Telecommunications Research Institute (ATR), Computational Neuroscience Laboratories, Kyoto, Japan.
- 04/2004 Honda Research Institute, Wako, Japan.
- 03/2004 The 31st NIPS International Symposium “Multidisciplinary Approaches to Sensorimotor Integration —Old Questions Meet New Concepts—,” NIPS, Okazaki, Japan.
- 08/2003 The 4th Summer Workshop for the Mechanism of the Brain and Mind, Echigoyuzawa, Japan (*in Japanese*).
- 02/2003 University of Tokyo, Graduate School of Medicine, Japan (*in Japanese*).
- 12/2002 National Cancer Institute (NIH), Laboratory of Population Genetics, Bethesda, USA.
- 11/2002 National Eye Institute (NIH), Laboratory of Sensorimotor Research, Bethesda, USA.
- 11/2002 Johns Hopkins University, Department of Biomedical Engineering, Baltimore, USA.
- 09/2002 The 7th Tamagawa Dynamic Brain Forum, Visegrad, Hungary.
- 09/2002 University of Freiburg, Department of Neurobiology and Biophysics, Freiburg, Germany.
- 09/2002 Technical University of Berlin, Department of Electrical Engineering and Computer Science, Berlin, Germany.
- 09/2002 Fraunhofer FIRST, The Intelligent Data Analysis Group, Berlin, Germany.
- 12/2001 Public Symposium on the Basal Ganglia and Cortical Areas for Motor Control, Tokyo, Japan (*in Japanese*).
- 09/2001 The 6th Tamagawa Dynamic Brain Forum, Breisach, Germany.
- 06/2001 NIPS Workshop on Visual and Perceptual Mechanisms, National Institute for Physiological Sciences, Okazaki, Japan (*in Japanese*).
- 01/2001 NIPS Workshop on Information Synthesis in the Brain for Motor Control, National Institute for Physiological Sciences, Okazaki, Japan (*in Japanese*).
- 08/2000 Neuroinformatics Summer School, Kanagawa, Japan (*in Japanese*).
- 10/1999 MIT, Department of Brain and Cognitive Sciences, Boston, USA.
- 09/1999 Satellite Symposium on Brain Sciences at the Biophysical Society of Japan Meeting, Wako, Japan (*in Japanese*).
- 06/1999 RIKEN BMC Forum, Nagoya, Japan (*in Japanese*).
- 08/1998 The 3rd Summer Workshop on System-Level Understandings of Higher-Order Brain Functions, Fujiyoshida, Japan (*in Japanese*).
- 02/1998 Workshop on “Present Homeostasis Approaches,” University of Tokyo, Tokyo, Japan (*in Japanese*).
- 04/1997 ATR, Human Information Processing Research Laboratories, Kyoto, Japan.

PATENTS

Kim CH, Tsujino H, **Nakahara H.** [inventor] (2010) Learning control system and learning control method. Series Code: 12, Serial No. 792853 (United States Patent; Application No. 20100318480. Filed date, 2010.6.3)

Kim, CH, Tsujino, H, **Nakahara, H.** [inventor] (2009) Learning control system and learning control method. Patent No. 5405252 (Japan Patent; Application No. 2009-217454; Application date, 2009.9.18; Registration date, 2013.11.8).

Kim, CH, Tsujino, H., **Nakahara, H.** [inventor] (2009) Learning control system and learning control method. Patent No. 5346701 (Japan Patent; Application No. 2009-141680; Application date, 2009.6.12; Registration date, 2013.8.23).

Hori G, **Nakahara H,** Inoue M, Nishimura S. [inventor] (2001) Chemical substance classification apparatus, chemical substance classification method, and program. Patent No. 381761 (Japan Patent; Application No. 2001-339396; Application date, 2001.11.5; Registration date, 2006.6.16).