Hideaki Shimazaki, Ph.D

Program-specific Associate Professor
Dept. of Intelligence Science and Technology
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Education

***Doctor of Philosophy*, Kyoto University** **2004 Apr - 2007 Mar**

Department of Physics, Graduate School of Science, Kyoto University, Kyoto, Japan.
Supervisor: Prof. Shigeru Shinomoto
Thesis title: Recipes for selecting the bin size of a histogram.

***Master of Arts (Neuroscience),* Johns Hopkins University** **2000 Aug - 2003 Nov**

Department of Neuroscience, School of Medicine, Baltimore, MD, USA.
Supervisor: Prof. Ernst Niebur
Thesis title: Communication over distributed neural systems.

***Bachelor of Engineering,* Keio University** **1996 Apr - 2000 Mar**

Department of Applied Physics and Physico-Informatics, Yokohama, Japan.
Supervisor: Prof. Yutaka Tomita, Prof. Takeshi Aihara, and Prof. Minoru Tsukada
Dissertation title: Identification of characteristic curve of synaptic modification by spike timing: approach with optical recording method.

Research Experience

Kyoto University **2017 Apr - Present**

Project-specific Associate Professor

Honda Research Institute Japan Co., Ltd. **2016 Aug - Present**

Senior Scientist

RIKEN Brain Science Institute, Research Scientist **2011 Apr - 2016 Jul**

Postdoctral researcher at Taro Toyoizumi lab

Massachusetts Institute of Technology, Visiting Researcher **2009 Dec - 2011 Mar**

Postdoctral researcher at Emery N. Brown lab

RIKEN Brain Science Institute, Visiting Researcher **2007 Aug - 2011 Mar**

Postdoctral researcher at Sonja Gruen lab

JSPS* Research Fellow at RIKEN Brain Science Institute **2008 Apr - 2011 Mar**

JSPS* Research Fellow at Kyoto University **2006 Apr - 2008 Mar**

* Japan Society for the Promotion of Science

Teaching Experience

Lectures

The Institute of Statistics and Mathematics, Tokyo, Japan **2016 Feb**

A fee-charging extension course for businesspersons and scholars on "**Introduction to statistical analysis of point process networks**" at the Institute of Statistics and Mathematics with Prof. Shinsuke Koyama. More than 72 people participated in this course.

International Christian University, Tokyo, Japan **2014 Dec – Present**

An undergraduate course on "**Statistical Physics"** at the Department of Material Science of the International Christian University. The course provides concepts in statistical physics including laws of thermodynamics, state functions, and the canonical ensemble formalism.

RIKEN Brain Science Institute, Saitama, Japan **2014 Dec – Present**

An introductory course on statistics titled "**Statistics for Neuroscience I and II**" as a part of lecture courses of the RIKEN Brain Science Training Program for selected graduate students. The course covers classical statistical tests and multivariate analysis. Lecture notes are available at http://goo.gl/gPLDG0.

Graduate School of Science and Technology at Meiji University, Tokyo, Japan **2013 May**

Introductory courses of Neuroscience. Course titles: "**Introduction to sensory systems, perception and neural coding studies**" and "**Introduction to neural decoding**".

The Institute for Research in Fundamental Sciences (IPM), Tehran, Iran **2013 Mar**

Invited two-week lecture course titled "**Introduction to statistical models of neural spike train data**" at School of Cognitive Sciences, IPM. This course covered recent modeling approaches for neuroscientific data with an introduction to a point process theory, generalized linear modeling, and adaptive filtering theory. The course materials are available at http://goo.gl/vXuGOH.

Supervision of graduate students

Ms. Safura Rashid Shomali (IPM, Tehran) **2013 Dec – Present**

Co-supervision of Ph.D. thesis with Prof. Majid Nili-Ahmadabadi. Ms. Shomali is a graduate student at IPM in Tehran, Iran. I met her when I gave a lecture course at her institute in March 3-12, 2013. Later she asked for my supervision, and I was officially appointed as a co-supervisor for her PhD thesis with Prof. Majid Nili- Ahmadabadi on Dec 4, 2013. She visited RIKEN during July 23- September 23 in 2014. I am supervising her project on theoretical analysis of the impact of a presynaptic input on a leaky integrate-and-fire neuron receiving noisy balanced inputs.

Mr. Christian Donner (BCCN Berlin) **2014 Jun – 2015 Apr**

Superviser of a summer-intern project at RIKEN Brain Science Institute and co-superviser of his master thesis at Bernstein Center for Computational Neuroscience (BCCN) Berlin with Prof. Klaus Obermayer. During 5/26-8/29 in 2014, Mr. Donner stayed at RIKEN BSI to study the dynamic model of neural interactions under my supervision, as one of three lab-rotation projects required for his Master's degree at BCCN Berlin. During his stay, he introduced an analytical approximation method to make the model applicable to large-scale analysis. Motivated by his

achievement, he selected this topic as his Master thesis, and I co-supervise his project with Prof. Klaus Obermayer.

Publications

Preprint

MaBouDi H, Shimazaki H, Soltanian-Zadeh H, Amari S. Learning Complex Representations from Spatial Phase Statistics of Natural Scenes. bioRxiv doi: https://doi.org/10.1101/112813

Shimazaki H. Neurons as an Information-theoretic Engine. *arXiv*:1512.07855, 2015.

Journal

Kass RE, Amari S, Arai K, Diekman CO, Diesmann M, Doiron B, Fairhall A, Fiddyment GM, Fukai T, Grün S, Harrison MT, Helias M, Nakahara H, Teramae J, Thomas PJ, Reimers M, Rodu J, Rotstein HG, Shea-Brown E, **Shimazaki H**, Shinomoto S, Yu BM, Kramer MA. Computational Neuroscience: Mathematical and Statistical Perspectives. Annual Review of Statistics and Its Application. in press

MaBouDi H, **Shimazaki H**, Giurfa M, Chittka L. Olfactory learning without the mushroom bodies: Spiking neural network models of the honeybee lateral antennal lobe tract reveal its capacities in odour memory tasks of varied complexities. PLoS Computational Biology (2017) 13(6): e1005551.

Donner C, Obermeyer K, **Shimazaki H.** Approximate Inference for Time-varying Interactions and Macroscopic Dynamics of Neural Populations. PLoS Computational Biology (2017) 13(1): e1005309

Mochizuki Y, Onaga T, **Shimazaki H**, Shimokawa T, Tsubo Y, Kimura R, Saiki A, Sakai Y, Isomura Y, Fujisawa S, Shibata K, Hirai D, Furuta T, Kaneko T, Takahashi S, Nakazono T, Ishino S, Sakurai Y, Kitsukawa T, Lee JW, Lee H, Jung MW, Babul C, Maldonado PE, Takahashi K, Arce-McShane FI, Ross CF, Sessle BJ, Hatsopoulos NG, Brochier T, Riehle A, Chorley P, Gruen S, Nishijo H, Ichihara-Takeda S, Funahashi S, Shima K, Mushiake H, Yamane Y, Tamura H, Fujita I, Inaba N, Kawano K, Kurkin S, Fukushima K, Kurata K, Taira M, Tsutsui K, Ogawa T, Komatsu H, Koida K, Toyama K, Richmond BJ, and Shinomoto S. Similarity in Neuronal Firing Regimes across Mammalian Species. Journal of Neuroscience 36:5736-5747, 2016.

Chou M.Y., Amo R., Kinoshita M., Cherng B.W., **Shimazaki H.**, Agetsuma M., Shiraki T., Aoki T., Takahoko M., Yamazaki M., Higashijima S., and Okamoto H. Social conflict resolution regulated by two dorsal habenular subregions in zebrafish. Science 352(6281) 87-90, 2016

MaBouDi H., **Shimazaki H.**, Amari S., Soltanian-Zadeh H., Representation of higher-order statistical structures in natural scenes via spatial phase distributions. Vision Research, Vol. 120, 61-73, 2016

Shimazaki H., Sadeghi K., Ishikawa T., Ikegaya Y., Toyoizumi T., Simultaneous silence organizes structured higher-order interactions in neural populations. Scientific Reports, 5, 9821, 2015.

Shimazaki H., Amari S., Brown E. N., and Gruen S., State-space analysis of time-varying higher-order spike correlation for multiple neural spike train data. PLOS Computational Biology, 8(3): e1002385, 2012.

Shimazaki H., Analysis of multiple neural spike train data using the log-linear model. (In Japanese) The brain and neural networks, 1(4), 194-203, 2011.

Shimazaki H. and Shinomoto S. Kernel bandwidth optimization in spike rate estimation. Journal of Computational Neuroscience, 29 (1-2) 171-182, 2010.

Shimazaki H. and Shinomoto S. A method for selecting the bin size of a time histogram. Neural Computation, Vol. 19(6), 1503-1527, 2007.

Shimazaki H. and Niebur E. Phase transitions in multiplicative competitive processes. Physical Review E, 72(1), 011912, 2005.

Tsukada M., Aihara T., Kobayashi Y., and **Shimazaki H.** Spatial analysis of spike-timing-dependent LTP and LTD in the CA1 area of hippocampal slices using optical imaging, Hippocampus, 15(1), 104-109, 2005.

Kobayashi Y, **Shimazaki H.**, Aihara T., Tsukada M. Spatial distributions of hippocampal LTP/LTD induced by electrically from schaffer collaterals and stratum oriens with relative timing. (In Japanese) The brain and neural networks, 8 (2), 57-64, 2001.

Refereed conference proceedings

Donner C. and **Shimazaki H.** Approximate inference method for dynamic interactions in larger neural populations. ICONIP 2016, Part III, LNCS 9949, 104–110, 2016

Shimazaki H. Single-trial estimation of stimulus and spike-history effects on time-varying ensemble spiking activity of multiple neurons: a simulation study. Journal of Physics: Conference Series, 473 012009, 2013.

Shimazaki H., Amari S., Brown E. N., and Gruen S. State-space Analysis on Time-varying Correlations in Parallel Spike Sequences. Proc. IEEE ICASSP, 3501-3504, 2009.

Shimazaki H. and Shinomoto S. A recipe for optimizing a time-histogram. Advances in Neural Information Processing Systems, Vol. 19, 1289-1296, 2007.

Shimazaki H. and Niebur E. Correlated multiplicative modulation in coupled oscillator systems: a model of selective attention. Progress of Theoretical Physics Supplement, No.161 336-339, 2006.

Book Chapter

Shimazaki H. Japanese translation of **Principles of Neural Science 5th ed.** Kandel E.R. et al. editors, Appendix F: Theoretical Approaches to Neuroscience: Examples from Single Neurons to Networks by Abbott L.F., Fusi S., and Miller K.D., p1567-1583, Medical Science International Inc., 2014. Original: p1601-1618, McGraw-Hill, 2012.

Selected invited talks

Queen Mary University of London, UK. Jul 4, 2016. Host Prof. Lars Chittka.
Title: Population coding of neurons: Dynamics, higher-order interactions, and mechanisms.

Bernstein Center of Computational Neuroscience Berlin, Berlin, Germany. Apr 2015. Host Prof. Klaus Obermayer.
Title: Simultaneous silence explains structured higher-order interactions of neural populations.

ELC International Meeting on "Inference, Computation, and Spin Glasses" (ICSG2013), Sapporo, Japan. Jul 2013.
Title: State-space analysis of time-varying higher-order interactions: its applications to neuroscience.

The 3rd Mathematical Neuroscience Workshop in School of Mathematics, Institute for Research in Fundamental Sciences (IPM). Tehran, Iran. Mar 2013. Title: The simultaneous silence of neurons explains higher-order interactions in ensemble spiking activity.

Workshop on Neural Information Flow, Kyoto University, Kyoto, Japan. Jun 2012. Title: Tracking dynamic neural interactions in awake behaving animals.

Neurostatistics Working Group Seminar, Dept. of Biostatistics, Harvard University, Dec 2010. Title: Analysis of dynamic neural spike data: from firing rates to spike correlations.

IEEE ICASSP2009, Special Session on `Signal Processing for Neural Spike Trains', Taipei, Taiwan. Apr 2009. Title: State-space analysis on time-varying correlations in parallel spike sequences.

NIPS 2008, Workshop on `Statistical Analysis and Modeling of Response Dependencies in Neural Populations', Whistler, Canada. Dec 2008. Title: State-space analysis on time-varying higher-order spike correlations.

Riken Brain Science Institute Forums, Wako, Japan. Host: Dr. Sonja Gruen. Apr 2007. Title: A recipe for optimizing a time histogram of spike data.

The Boadian Seminar at Mind/Brain Institute, Johns Hopkins University. Baltimore, USA. Host: Dr. Ernst Niebur. Mar 2007. Title: A recipe for constructing a peri-stimulus time histogram.

Awards

Excellent paper award at The 23rd International Conference on Neural Information Processing (ICONIP2016)	**2016 Oct**
Letter of Appreciation from the RIKEN president	**2009 Oct**
Japanese Neural Network Society Research Award 2009	**2009 Sep 26**
Japanese Neural Network Society Young Researcher Award 2007	**2007 Nov 15**

Research Grants and Fellowships

Excellent Young Researchers Overseas Visit Program by JSPS	**2009 Dec-2011 Mar**
Research Fellowship for Young Scientists by JSPS PD	**2008 Apr-2011 Mar**
Research Fellowship for Young Scientists by JSPS DC	**2006 Apr-2008 Mar**
Japan Student Services Organization (Fellowship)	**2004-2006**
Solo Snyder Foundation, Johns Hopkins University (Fellowship)	**2002-2004**
Murata Overseas Scholarship (Fellowship and Research Grant)	**2000-2002**

Travel Award

The 21st Century COE Center for Diversity and Universality in Physics.	**2006 Dec**
Tamura Memorial Foundation	**2006 May**
Japanese Neural Network Society	**2006 Jan**

Academic service

Journals reviewed for: PLOS Computational Biology (3 times), Neural Networks (3), Springer Encyclopedia (3), Computational Intelligence and Neuroscience (3), Journal of Computational Neuroscience, Neural Computation, Journal of Neuroscience Methods, Physical Review E, PLOS ONE, Cognitive Neurodynamics, Applied Mathematical Modeling, PeerJ.

Proceedings reviewed for: IEEE ICASSP (4 times), ICONIP, Journal of Physics: Conference Series, Progress of Theoretical Physics.

References

Prof Shigeru Shinomoto — PhD supervisor

Department of Physics, Graduate School of Science, Kyoto University
Email: shinomoto@scphys.kyoto-u.ac.jp Tel: 075-753-3778

Prof Ernst Niebur — MA supervisor

Department of Neuroscience, Johns Hopkins University
Email: niebur@jhu.edu Tel: 075-753-3778

Prof Sonja Grün — Postdoc supervisor

Research Center Juelich, Juelich, Germany
RTWH Aachen University, Aachen, Germany
Email: s.gruen@fz-juelich.de Tel: +49-(0)2461-61-4748

Prof Emery N. Brown — Postdoc supervisor

Massachusetts Institute of Technology
Warren M. Zapol Professor of Anesthesia, Harvard Medical School
Email:enb@neurostat.mit.edu Tel: +1-617-324-1879

Prof Taro Toyoizumi — Postdoc supervisor

RIKEN Brain Science Institute, Saitama, Japan
Email: taro.toyoizumi@brain.riken.jp Tel: +81-48-467-9644

List of all presentations

■ 2016

Donner C. and Shimazaki H., Estimating dynamic functional networks of larger neural populations. Society for Neuroscience 2016. Nov 16, 2016

Shomali S.R., Ahmadabadi M.N., Rasuli N. S., Shimazaki H., Exact analysis of spike-timing and higher-order interactions of neurons at the threshold regime suggests network architecture underlying sparse population activity. Society for Neuroscience 2016. Nov 14, 2016

Donner C. and Shimazaki H., Large-scale inference of time-varying neural interactions. The 23rd International Conference on Neural Information Processing (ICONIP 2016). Kyoto, Japan. Oct 16, 2016 (Talk by Donner) **EXCELLENT PAPER AWARD**

MaBouDi H., Shimazaki H., Lars Chittka L. Modelling elemental learning of honeybees by spiking neural networks. EURBEE 2016. Cluj-Napoca, Romania. Sep 7, 2016 (Talk by MaBouDi)

Shimazaki H. Toward thermodynamic principles of consciousness. University of Sussex, UK. Jul 7, 2016. **INVITED TALK**

Shimazaki H. Higher-order interactions of neural populations. University College London, UK. Jul 5, 2016. **TALK**

Shimazaki H. Population coding of neurons: Dynamics, higher-order interactions, and mechanisms. Queen Mary University of London, UK. Jul 4, 2016. **INVITED TALK**

Shomali S.R., Ahmadabad M.N., Shimazaki H., Rasuli SN. Exact spike-timing distribution reveals higher-order interactions. CNS*2016. Jeju, South Korea. Jul 2, 2016 (Poster by Shomali) **POSTER (Reviewed)**

Shimazaki H. Analysis of network activity of neurons by the dynamic Ising model. International Christian University, Tokyo, Japan. Feb 2, 2016 **INVITED TALK**

Shimazaki H. Simultaneous silence explains structured higher-order interactions of neural population. MONA2 - Modelling Neural Activity. Hawaii, USA. Jun 22, 2016 **TALK**

Shimazaki H., Peters A.J., Komiyama T., Toyoizumi T. Redundant coding by layer 2/3 neurons of motor cortex during initial motor learning. Mechanism of Brain and Mind, Rusutsu, Hokkaido, Japan. Jan 6-8, 2016 **POSTER**

■ 2015

Donner C. and Shimazaki H., Approximation methods for inferring time-varying interactions of a large neural population. Workshop in Statistical Methods for Understanding Neural Systems at Neural Information Processing Systems (NIPS) 2015. Montreal Canada, Dec 11, 2015 **POSTER (Reviewed)**

Shimazaki H. Simultaneous silence explains structured higher-order interactions of neural populations. Juelich Research Center. Juelich, Germany. May 5, 2015 **INVITED TALK**

Shimazaki H. Simultaneous silence explains structured higher-order interactions of neural populations. Bernstein Center of Computational Neuroscience Berlin. Berlin, Germany. Apr 28, 2015 **TALK**

■ 2014

Sharp T., Shimazaki H., Isomura Y., Fukai T. State-space analysis of behaviour- and layer-dependent synchrony in motor cortex during volitional arm movement. Society for Neuroscience (SfN) 2014, Washinton DC, USA. Nov 16, 2014. **POSTER**

Sharp T., Shimazaki H., Isomura Y., Fukai T. Behaviour- and layer-dependent synchrony in motor cortex during volitional arm movement. Neuro2014, Yokohama, Japan. Sep 11, 2014. **POSTER**

Shomali S.R., Ahmadabadi M.N., Shimazaki H., Rasuli N. S. Theoretical study on spike-timing probability in a pair of pre-post synaptic neurons. Neuro2014, Yokohama, Japan. Sep 11,2014. **POSTER**

MaBouDi H., Shimazaki H., Abouzari M., Soltanian-Zadeh H., Amari S. Bimodal distributions of local phase variables in natural images. The 2014 Vision Sciences Society (VSS) Annual Meeting, St. Pete Beach, Florida, USA. May 18, 2014 **POSTER (Reviewed)**

Sharp T., Shimazaki H., Isomura Y., Fukai T. Behaviour- and layer-dependent synchrony in motor cortex during volitional arm movement. Workshop on data mining in neuroscience. National Institute of Informatics, Tokyo, Japan. May 28-29, 2014 **TALK**

MaBouDi H., Shimazaki H., Abouzari M., Amari S, Soltanian-Zadeh H. Statistical inference for directed phase coupling in neural oscillators. Computational and Systems Neuroscience (Cosyne) 2014. Salt Lake City, USA. Feb 27 **POSTER (Reviewed)**

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T. Structured higher-order interactions explain the simultaneous silence of neural populations. Mechanism of Brain and Mind, Rusutsu, Hokkaido, Japan. Jan 8-10, 2014 **POSTER**

■ 2013

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T., The simultaneous silence of neurons explains structured higher-order interactions in ensemble spiking activity. Society for Neuroscience (SfN). San Diego, USA. Nov 9-13 **POSTER**

Shimazaki H., State-space Analysis of Time-varying Higher-order Interactions: its Applications to Neuroscience. ELC International Meeting on "Inference, Computation, and Spin Glasses" (ICSG2013). Sapporo, Japan. Jul 28 **INVITED TALK**

Shimazaki H., Higher-order interactions in population activity of hippocampal CA3 neurons. Workshop on statistical analysis of neurophysiological and clinical data, Kyoto, Japan. Jul 8-9 **TALK**

Shimazaki H., Estimating Time-varying Higher-order Neuronal Interactions in Awake Behaving Animals. Modeling Neural Activity: Statistics, Dynamical Systems, and Networks, Lihue, Hawaii, USA. 2013 Jun 26-28 **TALK**

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T., The simultaneous silence of neurons explains higher-order interactions in ensemble spiking activity. Neuro2013, Kyoto, Japan. Jun 20 **POSTER**

Shimazaki H. Estimating dynamic neural interactions in awake behaving animals. The 3rd Mathematical Neuroscience Workshop in School of Mathematics, Institute for Research in Fundamental Sciences (IPM). Tehran, Iran. Mar 13 **INVITED TALK**

Shimazaki H. The Simultaneous Silence of Neurons Explains Higher-Order Interactions in Ensemble Spiking Activity. The 3rd Mathematical Neuroscience Workshop in School of Mathematics, Institute for Research in Fundamental Sciences (IPM). Tehran, Iran. Mar 14 **INVITED TALK**

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T. The simultaneous silence of neurons explains structured higher-order interactions in spontaneous spiking activity. Dialog between Neuroscience and Statistics, Institute of Mathematics and Statistics, Tokyo, Japan. Feb 18-19 **TALK**

■ 2012

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T. Joint inactivation statistics of population spiking activities. RIKEN BSI Retreat 2012, Karuizawa, Japan. Nov 12-13 **POSTER**

Shimazaki H. The simultaneous silence of neurons explains structured higher-order interactions in ensemble spiking activity. RIKEN BSI Lunch Seminar 2012, Wako, Japan. Nov 8 **TALK**

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T. Joint inactivation statistics of population spiking activities. Workshop on statistical aspects of neural coding. Nov 1-2. Kyoto University & Ritsumeikan University. **TALK**

Shimazaki H. Tracking Dynamic Neural Interactions in Awake Behaving Animals. Workshop on neural information flow, Kyoto University, Kyoto, Japan. Jun 20 **INVITED TALK**

Shimazaki H., Sadeghi K., Ikegaya Y., Toyoizumi T. The simultaneous silence of neurons explains higher-order interactions in ensemble spiking activity. Computational and Systems Neuroscience (Cosyne) 2012. Salt Lake City, USA. Feb 23-26 **POSTER (Reviewed)**

■ 2011

Shimazaki H., Amari S., Brown E. N., and Gruen S. Dynamics of Higher-order Spike Correlation in an Awake Behaving Monkey: Analysis by a State-space Model. RIKEN BSI Retreat, Karuizawa, Japan. Oct 31 **POSTER**

Shimazaki H., Ikegaya Y., and Toyoizumi T. A New Sparse Log-linear Model for Simultaneously Active and Inactive Neurons. RIKEN BSI Retreat, Karuizawa, Japan. Oct 31 **POSTER**

Shimazaki H. and Brown E.N. Copula-based Mixture Time-series Model of Continuous and Point Processes for Synthetic Analysis of Neural Signals. RIKEN BSI Retreat, Karuizawa, Japan. Oct 31 **POSTER**

Shimazaki H. and Brown E. N. Constructing a joint time-series model of continuous and Bernoulli/Poisson processes using a copula. Computational and Systems Neuroscience (Cosyne) 2011, Salt Lake City, USA. Feb 24-27 **POSTER (Reviewed)**

■ 2010

Shimazaki H. Analysis of Dynamic Neural Spike Data: From Firing Rates to Spike Correlations. Neurostatistics Working Group Seminar, Dept. of Biostatistics, Harvard University, Boston, USA. Dec 1 **INVITED TALK**

Shimazaki H. Detection of dynamic cell assemblies by the Bayes Factor. Workshop on spatio-temporal neuronal computation, Kyoto University, Kyoto, Japan. Sep 6-7 **INVITED TALK**

Shinomoto S*, Shimazaki H, and Shimokawa T. Characterizing neuronal firing with the rate and the irregularity. Neuro2010, Kobe, Japan. Sep 2 S3-10-1-3 **TALK**

Shimazaki H., Gruen S., and Amari S. Analysis of subsets of higher-order correlated neurons based on marginal correlation coordinates. Computational and Systems Neuroscience (Cosyne) 2010, Salt Lake City, USA. Feb 25-28 **POSTER (Reviewed)**

■ 2009

Shimazaki H., Amari S., Brown E. N., and Gruen S. State-space Model of Dynamic Spike Correlation. Japanese Neural Network Society 2009. Sendai, Japan. Sept. 24-26. TALK+POSTER **Japanese Neural Network Society 2009 Distinguished Research Award**

Shimazaki H. Analysis of Dynamic Spike Data: From Spike Rate to Multiple Neuron Spike Correlation. The 6th Brain Lunch Seminar. RIKEN Brain Science Institute, Saitama, Japan. Sep 8. **TALK**

Shimazaki H., Amari S., Brown E. N., and Gruen S. Bayes Factor Analysis for Detection of Time-dependent Higher-order Spike Correlations. CNS2009. Berlin, Germany. Jul 18-23 P99 **POSTER**

Shimazaki H. and Shinomoto S. Histogram binwidth and kernel bandwidth selection for the Spike-rate estimation. CNS2009. Berlin, Germany. Jul 18-23 P116 **POSTER**

Shimazaki H., Amari S., Brown E. N., and Gruen S. Estimating time-varying spike correlations from parallel spike sequences, German-Japanese Workshop "Computational and Systems Neuroscience", Berlin, Germany. May 25-28 **POSTER**

Shimazaki H., Amari S., Brown E. N., and Gruen S. State-space Analysis on Time-varying Correlations in Parallel Spike Sequences. IEEE ICASSP2009 Special Session on `Signal Processing for Neural Spike Trains', Taipei, Taiwan. Apr 24 SS-L10.4 **INVITED LECTURE**

Shimazaki H., Amari S., Brown E. N., and Gruen S. Detection of non-stationary higher-order spike correlation. Cosyne 2009, Salt Lake City, USA. Feb 26 -Mar 3 II-62 **POSTER (Reviewed)**

■ 2008

Shimazaki H., Amari S., Brown E. N., and Gruen S. State-space Analysis on Time-varying Higher-order Spike Correlations. NIPS2008 Workshop on `Statistical Analysis and Modeling of Response Dependencies in Neural Populations', Whistler, Canada. Dec 13 **INVITED TALK**

Shimazaki H. and Gruen S. Selecting a state-space model of higher-order correlations in parallel spike trains from competing hierarchical log-linear models. RIKEN BSI Retreat 2008, Karuizawa, Japan. Nov 4-5 **POSTER**

Shimazaki H. and Shinomoto S. Spike-rate Estimation with Locally Adaptive Kernel Method. Japanese Neural Network Society 2008, Tsukuba, Japan (In Japanese). Sep 24-26 PS3-4 **SPOTLIGHT POSTER**

Shimazaki H. and Gruen S. Estimating time-dependent higher-order interactions in parallel spike trains. Neuro2008, Tokyo, Japan. Jul 9-11 **POSTER**

Shimazaki H., Brown E. N. and Gruen S. State-space Analysis on Time-dependent Correlation in Parallel Spike Trains. Statistical Analysis of Neuronal Data (SAND4), Pittsburgh, PA, USA. May 29-31 **POSTER**

■ 2007

Shimazaki H. and Gruen S. Estimation of Time-dependent Higher-Order Interactions in Parallel Spike Trains. Riken BSI Retreat, Karuizawa, Japan. Nov 26-28 **POSTER**

Shimazaki H. and Shinomoto S. Kernel Width Optimization in the Spike-rate Estimation. Neural Coding 2007, Montevideo, Uruguay. Nov 7 POSTER **BEST POSTER AWARD**

Shimazaki H. and Shinomoto S. Optimization of a Histogram of Spike Data. Neuro2007, Yokohama, Japan. Sep 11 P2-k22 **POSTER**

Shimazaki H. A Recipe for Optimizing a Time Histogram of Spike Data. Riken BSI Forums at RIKEN Brain Science Institute, Wako, Japan. Host: Sonja Gruen. Apr 17 **INVITED TALK**

Shimazaki H. A recipe for constructing a Peri-stimulus Time Histogram. The Boadian Seminar at Mind/Brain Institute. Johns Hopkins University, Baltimore, USA. Host: Ernst Niebur. Mar 1 **INVITED TALK**

Shimazaki H. and Shinomoto S. A recipe for optimizing a time-histogram with variable bin sizes. Computational and Systems Neuroscience 2007, Salt Lake City, USA. Feb 22-27 **POSTER (Reviewed)**

■ 2006

Shimazaki H. and Shinomoto, S. A recipe for optimizing a time-histogram. Neural Information Processing Systems, Whistler, B. C. Dec 4-9 **POSTER (Reviewed) selected as a SPOTLIGHT POSTER**

Shimazaki H. A method to optimize a time histogram by correcting onset latencies of spike sequences Japanese Neural Network Society 2006, Nagoya, Japan. Sep 1-2 (In Japanese) O4-1 **TALK＋POSTER**
Japanese Neural Network Society 2007 Young Researcher Award

Shimazaki H. Self-organized criticality by natural selection. Frontiers in Dynamics: Physical and Biological Systems Tokyo, Japan. May 22-24, 2006, **POSTER**

Shimazaki H. and Shinomoto S. Recipes for constructing an optimal time histogram. Statistical Analysis of Neuronal Data (SAND3) Pittsburgh, PA, USA. May 12-13, 2006, **POSTER**

■ 2005

Shimazaki H. and Shinomoto S. A Recipe for Making a Time Histogram with an Optimal Bin Width from Spike Sequences. Japanese Neural Network Society 2005, Kagoshima, Japan (In Japanese) **SPOTLIGHT POSTER**