

Curriculum Vitae

Name: Yoko Yamaguchi

Born: Feb. 1955, in Nagano, Japan

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Education:

Graduated from Faculty of Pharmaceutical Sciences, University of Tokyo, in March 1978

Graduated from Master program of Graduate School, University of Tokyo, in March 1980

Thesis: "Theoretical studies of synchronization as a coordinative mechanism

in biological rhythms", Doctor of Pharmaceutical Sciences

(University of Tokyo), in February 1986

Occupation:

1982 Jan. ~ 1993 Feb. Research Instructor at Faculty of Pharmaceutical Sciences, University of Tokyo

1993 Mar. ~ 1993 Mar. Lecturer at Faculty of Pharmaceutical Sciences, University of Tokyo

1993 Apr. – 1996 Sep. Associate Professor at Department of Information Sciences, College of Science and Engineering, Tokyo Denki University

1993 Apr. -1995 Mar. Guest Associate Professor at Division of Biocybernetics, Medical Research Institute, Tokyo Medical and Dental University

1996 Oct. ~ 2000 Sep. Professor at Department of Information Sciences, College of Science and Engineering, Tokyo Denki University

2000 Oct. ~ Laboratory Head, Laboratory for Dynamics of Emergent Intelligence, Brain Science Institute (BSI), RIKEN

Concurrent Post:

1982 Atom Researcher at Institute of Fundamental Physics, Kyoto University

1991~1992, 1995~1996 Lecturer at College of Arts and Sciences, University of Tokyo

1995~1996 Lecturer at Graduate School , University of Tokyo

1995 Lecturer at National Institute of Bioscience and Human-Technology, Agency of Industrial Science and Technology, Ministry of International Trade and Industry

1996 Jul. Visiting Researcher at Marburg University hosted by Prof. Eckhorn

1996~1997 Lecturer at Graduate School , Tokyo Institute of Technology

1998 Feb. ~ Ju. Visiting Researcher at the University of Arizona hosted by Prof. McNaughton

1998 Jul. ~ 2000 Mar. Visiting researcher at BSI RIKEN

1999 ~ 2000 Lecturer at College of Science, Ryukyu University

1999 ~ 2000 Lecturer at Toyohashi Technology and Science

1999 ~ 2001 Researcher at Frontier Research Center, Tokyo Denki University

1999~ 2004 Principal Investigator of Core Research Evolution of Science and Technology (CREST) Project, Japan Science and Technology agency

2000 Apr. ~ 2000 Sep. Visiting laboratory head , Laboratory for Dynamics of Emergent Intelligence, BSI RIKEN

2000 Oct. ~2011 Mar. Visiting Professor at Graduate School of Science and Engineering, Tokyo Denki University

2001 Oct. ~2002 Mar. Lecturer, Faculty of Pharmaceutical Sciences, University of Tokyo

2002 Oct. ~ 2003 Mar. Lecturer, Department of Engineering, Saitama University

2002 Oct. ~ 2003 Mar. Lecturer, Department of Engineering, Kagawa University

2003 Apr. ~ 2005 Mar. Lecturer, Graduate School, Program of Engineering, University of Tokyo

2003 Apr. ~ 2005 Mar. Lecturer, Faculty of Science, University of Tokyo

2004 Mar. Lecturer, Faculty of Science and Technology, Kinki University

2005 Nov. Lecturer, 21st Century COE Program, Kanazawa University

2006 Nov. Lecturer, Graduate School, Program of Engineering, Okayama University

2007 Nov. ~ 2011 Mar. Unit Leader, Rhythm-based Brain Computation Unit, RIKEN-Toyota Collaboration Center

2005 Apr. ~ Lecturer, Graduate School, Program of Science and Technology, Meiji University

2007 Nov. ~ Strategy Unit Member, RIKEN-Toyota Collaboration Center

2008 Apr. ~ Visiting Researcher, Research Center for Advanced Science and Technology, The University of Tokyo.

2011 Apr. ~ Research Scientist, Rhythm-based Brain Computation Unit, RIKEN-Toyota Collaboration Center.

2011 Apr. ~ Adjunctive Professor, Kyusyu Institute of Technology.

Award:

1995 The best paper in a year in Japan Neural Network Society.

2006 The best poster award , ICONIP2006

- 2007 Editors Choice Award on the recommendation of the Editorial Board, NeuroImage:
System Neuroscience Section
- 2008 The best paper award, IJCNN2008
- 2009 Runner-Up Student Paper Award IJCNN 2009
- 2011 The best poster award ICCN 2011

Main Public Committee:

- 1995~ Advisory Committee at Science and Technology Society, Saitama Prefecture.
- 1998~ Advisory Committee at Neurocomputing meeting, Society of Electyricity, Information and Communication.
- 1998~ Advisory Committee at Japanese Biophysical Society.
- 1999~ Principal Investigator of a CREST JST project.
- 1999~2001 Board of Japanese Neural Network Society.
- 2000~ Editor, Journal of Neural Networks.
- 2002 ~2004 Vice-Director of Editorial Board, The Brain and Neural Networks.
- 2002 ~ Editor, Journal of Integrative Neuroscience.
- 2006 ~ Cognitive Neurodynamics, Editor.
- 2006~ Human Frontier Science Program Long Term Fellowship Reviewing Committee.
- 2007~ 2010 Dynamic Brain platform, Vice Chair .
- 2007 Neuro 2007, Yokohama, Program Committee.
- 2007 ICONIP2007, Kitakyusyu, Track-co-chair, Special Session Organizer.
- 2007 ICCN2007, Shanghai, Advisory Committee.
- 2007 International School of Neural Nets "E.R.Caianiello"2007 Dynamic Brain,
Co-director.
- 2007 ~ Advisor, PRESTO, Japan Science and Techonology
- 2010 ~ Dynamic Brain Platform Chair
- 2011 General Chair of ICCN 2011, Hilton Niseko Village, Hokkaido.
- 2011 Wrokshop Chair of NBNI 2011.
- 2011 ~ Board of Japanese Neural Network Society.

Original papers since 2000:

1. Masahiro Kawasaki and Yoko Yamaguchi, Effects of Subjective Preference of Colors on Attention-related Occipital Theta Oscillations, *NeuroImage* (in press.)
2. Kitajo K, Miyota R, Shimono M, Yamanaka K, Yamaguchi Y "State-dependent cortical synchronization networks revealed by TMS-EEG recordings", *Advances in Cognitive Neurodynamics (II) - Proceedings of the 2nd International Conference on Cognitive Neurodynamics (ICCN 09)*, pp. 145-148(2011)
3. Kawasaki M, Yamaguchi Y, "Frontal theta for executive functions and parietal alpha for storage buffers in visual working memory", *Advances in Cognitive Neurodynamics (II) - Proceedings of the 2nd International Conference on Cognitive Neurodynamics (ICCN 09)*, pp. 107-110(2011)
4. Kawasaki M, Kitajo K, Yamaguchi Y, "Hierarchical Control Structures of the Frontal Theta and Alpha Activity for the Dual Auditory and Visual Working Memory Task", *International Journal of Psychophysiology, Vol. 77, No. 3*, pp305 (Sep. 2010)
5. Kawasaki M, Kitajo K, Yamaguchi Y, "Dynamic links between theta executive functions and alpha storage buffers in auditory and visual working memory", *European Journal of Neuroscience, Vol. 31*, pp. 1683-1689 (2010)
6. Sato N, Yamaguchi Y, "Simulation of Human Episodic Memory by Using a Computational Model of the Hippocampus", *Advances in Artificial Intelligence, Vol. 2010*, pp. 392868-1-392868-10 (2010)
7. Schuster A, Yamaguchi Y, "Application of Game Theory to Neuronal Networks", *Advances in Artificial Intelligence, Vol. 2010*, pp. 12 (2010)
8. Sato N, Ozaki T, Someya Y, Anami K, Ogawa S, Mizuhara H, Yamaguchi Y, "Subsequent memory-dependent EEG theta correlates to parahippocampal blood oxygenation level-dependent response", *NeuroReport, Vol. 21*, pp. 168-172 (2010)
9. Wu Z, Yamaguchi Y, "Independence of the unimodal tuning of firing rate from theta phase precession in hippocampal place cells", *Biological Cybernetics, Vol. 102*, pp. 95-107 (2010)
10. Schuster A, Yamaguchi Y, "The survival of the fittest and the reign of the most robust---in biology and elsewhere ", *Minds and Machines, Vol. 19*, pp. 361-389 (2009)
11. Sato N, Yamaguchi Y, "A Computational Predictor of Human Episodic Memory Based on a Theta Phase Precession Network", *PLoS One, Vol. 4 No. 10*, pp. e7536-1-e7536-9 (2009)
12. Islam T, Yamaguchi Y, "Some Computational Predictions on the Possibilities of

Three-Dimensional Properties of Grid Cells in Entorhinal Cortex", *Lecture Notes in Computer Science*, Vol. 5863, pp. 26-33 (2009)

13. Sato N, Yamaguchi Y, "Spatial-area selective retrieval of multiple object-place associations in a hierarchical cognitive map formed by theta phase coding", *Cognitive Neuro dynamics*, Vol. 3 No. 2, pp. 131-140 (2009)
14. Colliaux D, Molter C, Yamaguchi Y, "Working memory dynamics and spontaneous activity in a flip-flop oscillations network model with the Milnor attractor", *Cognitive Neuro dynamics*, Vol. 3 No. 2, pp. 141-151 (2009)
15. Wagatsuma H, Yamaguchi Y, "Synchronized rhythmic signals effectively influence ongoing cortical activity for decision-making: A study of the biological plausible neural network model ", *Lecture Notes in Computer Science*, Vol. 5506, pp. 857-864 (2009)
16. Yoko Yamaguchi, Colin Molter, Zhihua Wu, Harshavardhan A Agashe, Hiroaki Wagatsuma: A computational model of formation of grid field and theta phase precession in the entorhinal cells. Proceedings of International Conference on Neural Information Processing (ICONIP) 2007, Kitakyusyu.
17. Molter Colin, Yamaguchi Yoko: "Entorhinal theta phase precession sculpts dentate gyrus place fields" *Hippocampus*, 18, 9, 919--930 (2008)
18. Colliaux David, Yamaguchi Yoko, Molter Colin, Wagatsuma Hiroaki: "Working Memory Dynamics in a Flip-Flop Oscillations Network Model with Milnor Attractor" *Lecture Notes in Computer Science*, 4984, 160--169 (2008)
19. Wagatsuma Hiroaki, Yamaguchi Yoko: "Context-Dependent Adaptive Behavior Generated in the Theta Phase Coding Network" *Lecture Notes in Computer Science*, 4985, 177--184 (2008)
20. Yamaguchi Yoko, Molter Colin, Wu Zhihua, Agashe Harshavardhan, Wagatsuma Hiroaki: "A Computational Model of Formation of Grid Field and Theta Phase Precession in the Entorhinal Cells" *Lecture Notes in Computer Science*, 4984, 151--159 (2008)
21. Naoyuki Sato and Yoko Yamaguchi (2007) EEG theta regulates eye saccade generation during human object-place memory encoding. Proceedings of the 1st International Conference on Cognitive Neurodynamics - 2007 (ICCN'07) and the 3rd Shanghai International Conference on Physiological Biophysics - Cognitive Neurodynamics. 3-06-0006 (SICPB'07).
22. Colin Molter and Yoko Yamaguchi (2007) The phase precession for spatial representation and memory formation, Proceedings of the 1st International Conference on Cognitive Neurodynamics - 2007 (ICCN'07) and the 3rd Shanghai International Conference on Physiological Biophysics - Cognitive Neurodynamics 2-09-0002(SICPB'07).

23. Hiroaki Wagatsuma and Yoko Yamaguchi: Context-dependent adaptive behaviors in the theta phase coding network, Proceedings of International Conference on Neural Information Processing (ICONIP) 2007, Kitakyusyu
24. David Colliaux, Yoko Yamaguchi, Colin Molter, Hiroaki Wagatsuma: Working memory dynamics in a flip-flop oscillation network model with Milnor attractor
25. Keiichi Kitajo, Takashi Ozaki and Yoko Yamaguchi, Large-scale neural synchrony associated with top-down selective attentional modulation of necker cube perception. Proceedings of the 23rd Annual Meetings of the International Society for Psychophysics, 345-350, 2007.
26. Yamaguchi Yoko, Sato Naoyuki, Wagatsuma Hiroaki, Wu Zhihua, Molter Colin, Aota Yoshito: A unified view of theta-phase coding in the entorhinal-hippocampal system, Current Opinion in Neurobiology, 17, 2, 197-204, 2007
27. Wagatsuma Hiroaki, Yamaguchi Yoko: Neural Dynamics of the Cognitive Map in the Hippocampus, Cognitive Neurodynamics, 1, 119-141, 2007
28. Sato Naoyuki, Yamaguchi Yoko: Theta synchronization networks emerge during human object-place memory encoding, NeuroReport, 18, 5, 419-424, 2007
29. Mizuhara Hiroaki, Yamaguchi Yoko: Human cortical circuits for central executive function emerge by theta phase synchronization, NeuroImage, 36, 1, 232--244, 2007
30. Molter Colin, Sato Naoyuki, Yamaguchi Yoko: Reactivation of behavioral activity during sharp waves A computational model for two stage hippocampal dynamics, Hippocampus, 17, 3, 201-209, 2007
31. Astolfi Laura, Bakardjian Hovagim, Cincotti Febo, Mattia Donatella, Grazina Marciani, Fallani Fabrizio De Vico, Colosimo Alfredo, Salinari Serenella, Miwakeichi Fumikazu, Yamaguchi Yoko, Vazquez Pablo Martinez, Cichocki Andrzej, Tocci Andrea, Babiloni Fabio: "Estimate of Causality Between Independent Cortical Spatial Patterns During Movement Volition in Spinal Cord Injured Patients" Brain Topography, 19, 107--123 (2007)
32. Wu Zhihua, Yamaguchi Yoko: Conserving total synaptic weight ensures one-trial sequence learning of place fields in the hippocampus, Neural Networks, 19, 547-563, 2006
33. Wagatsuma Hiroaki, Yamaguchi Yoko: Disambiguation in spatial navigation with theta phase coding, Neurocomputing, 69, 1228-1232, 2006
34. Bakardjian Hovagim, Cichocki Andrzej, Cincotti Febo, Mattia Donatella, Babiloni Fabio, Marciani Maria G., Fallani Fabrizio De V., Miwakeichi Fumikazu, Yamaguchi Yoko, Martinez Vazquez Pablo, Salinari Serenella, Tocci Andrea, Astolfi Laura: Estimate of Causality Between Cortical Spatial Patterns During Voluntary Movements in Normal Subjects, International Journal of Bioelectromagnetism, 8, 1, II/1--II/18, 2006

35. Molter Colin, Sato Naoyuki, Salihoglu Utku, Yamaguchi Yoko: How Reward Can Induce Reverse Replay of Behavioral Sequences in the Hippocampus, Proceedings of the 13th International Conference on Neural Information Processing (ICONIP'06), Springer, 1-10, Heidelberg, China, 10, 2006
36. Sato Naoyuki, Yamaguchi Yoko: On-line formation of a hierarchical cognitive map for object-place association by theta phase coding, *Hippocampus*, 15, 963-978, 2005
37. Mizuhara Hiroaki, Wang Li-Qun, Kobayashi Koichiro, Yamaguchi Yoko: Long-range EEG phase synchronization during an arithmetic task indexes a coherent cortical network simultaneously measured by fMRI, *NeuroImage*, 27, 553-563, 2005
38. Yamaguchi Yoko, Aota Yoshito, Sato Naoyuki, Wagatsuma Hiroaki, Wu Zhihua: Synchronization of neural oscillations as a possible mechanism underlying episodic memory: A study of theta rhythm in the hippocampus, *Journal of Integrative Neuroscience*, 3, 143--157, 2004
39. Wu Zhihua, Yamaguchi Yoko: Input-dependent learning rule for the memory of spatiotemporal sequences in hippocampal network with theta phase precession, *Biological Cybernetics*, 90, 113--124, 2004
40. Wagatsuma Hiroaki, Yamaguchi Yoko: Cognitive map formation through sequence encoding by theta phase precession, *Neural Computation*, 16, 2665-2697, 2004
41. Mizuhara Hiroaki, Wang Li-Qun, Kobayashi Koichiro, Yamaguchi Yoko: A long-range cortical network emerging with theta oscillation in a mental task, *NeuroReport*, 15, 1233-1238, 2004
42. Miwakeichi Fumikazu, Montes Eduardo Martinez, Valdes-Sosa Pedro, Nishiyama Nobuaki, Mizuhara Hiroaki, Yamaguchi Yoko: Decomposing EEG data into space-time-frequency components using parallel factor analysis, *NeuroImage*, 22, 1035-1045, 2004
43. A learning algorithm for solving maze tasks with episodic memory, *Information Processing Society, SIG Notes*, 2004, 42, 21-24, 2004 Sato Naoyuki, Yamaguchi Yoko: Memory encoding of object relocation in a hierarchical associative network with theta phase coding, Proceedings of International Joint Conference on Neural Networks (IJCNN 2004)/ IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2004), IEEE, 637-642, Piscataway, Hungary, 7, 2004
44. Yamaguchi Yoko, Aota Yoshito, Sato Naoyuki, Wagatsuma Hiroaki, Wu Zhihua: Hippocampal theta phase coding for instantaneous acquisition of experienced events, Proceedings of International Joint Conference on Neural Networks (IJCNN 2004)/ IEEE International Conference on Fuzzy Systems (FUZZ-IEEE 2004), IEEE, 3053-3058, Piscataway, Hungary, 7, 2004
45. Yamaguchi Yoko: A theory of hippocampal memory based on theta phase

- precession, *Biological Cybernetics*, 89,1-9, 2003
46. Sato Naoyuki, Yamaguchi Yoko: Memory encoding by theta phase precession in the hippocampal network, *Neural Computation*, 15,2379-2397,2003
 47. Barakova Emilia, Lourens Tino, Yamaguchi Yoko, Mira Jose, Alvarez Jose R: Life-long learning: consolidation of novel events into dynamic memory representations, *Lecture Notes in Computer Science*, 2686, 1, 110-117, 2003
 48. Yamaguchi Yoko, Aota Yoshito, McNaughton Bruce L, Lipa Peter: Bimodality of theta phase precession in hippocampal place cells in freely running rats, *Journal of Neurophysiology*, 87,2629-2642,2002
 49. Yamaguchi Yoko: Theta phase dependent memory formation in the hippocampus, *Journal of Japan Pharmacological Society*, Vol.22, pp.169-173 (2002).
 50. Nishiyama Nobuaki, Mizuhara Hiroaki, Miwakeichi Fumikazu, Yamaguchi Yoko, Wang Lipo, Rajapakse Jagath C., Fukushima Kunihiro, others: Theta episodes observed in human scalp EEG during virtual navigation: Spatial distribution and task dependence, *Processing (ICONIP'02)*; 4th Asia-Pacific Conference on Simulated Evolution and Learning (SEAL'02); 1st International Conference on IEEE, program no.2195, Piscataway, Singapore, 2002
 51. Sato Naoyuki, Yamaguchi Yoko, Wang Lipo, others.: A neural network model of the hippocampus with theta phase precession for object-place memory, *Proceedings of the 9th International Conference on Neural Information Processing (ICONIP'02)(CD-ROM)*, IEEE, 1852-1--1852-5, Piscataway, Singapore, 11, 2002
 52. Wu Zhihua, Yamaguchi Yoko: Learning and retrieval of spatio-temporal sequences in the hippocampal network with theta phase precession, *Proceedings of 8th International Conference on Neural Information Processing (ICONIP-2001)*, Fudan University, 671-676, Shanghai, China, 11, 2001
 53. Nishiyama Nobuaki, Yamaguchi Yoko: Human EEG theta in the spatial recognition task, *Proceedings of 5th World Multiconf. on Systemics, Cybernetics and Informatics (SCI 2001)*, 7th Int. Conf. on Information Systems, Analysis and Synthesis (ISAS 2001), International Institute of Informatics and Systemics, 497-500, Orlando, USA, 7,2001
 54. Wagatsuma Hiroaki, Yamaguchi Yoko: Learning of the cognitive map in the hippocampal network, *Proceedings of 5th World Multiconf. on Systemics, Cybernetics and Informatics (SCI 2001)*, 7th Int. Conf. on Information Systems, Analysis and Synthesis (ISAS 2001), International Institute of Informatics and Systemics, 505-509, Orlando, USA, 7, 2001
 55. Yamaguchi Yoko: Synchronization in the hippocampus as a neural principle representing contextual information, *Proceedings of 5th World Multiconf. on Systemics, Cybernetics and Informatics (SCI 2001)*, 7th Int. Conf. on Information Systems, Analysis and Synthesis

(ISAS 2001), International Institute of Informatics and Systemics, 501-504, Orlando, USA, 7, 2001

56. Yamaguchi Yoko, Horikawa Junsei, Taniguchi Ikuo, Poznanski R.: Population network dynamics and modeling of vocal processing in the cortex, Biophysical Neural Networks, Mary Ann Liebert Inc., 343-361, 2001
57. N. Haga, Y. Yamaguchi: a Study of storage and retrieval of temporal sequence in the hippocampus by using a theta phase precession model, Technical report of IEICE NC99-124 51-58, 2000.
58. H. Wagatsuma, Y. Yamaguchi: Self-Organization of the cognitive map based on theta phase precession, Technical report of IEICE NC99-124 51-58, 2000.
59. Sato Naoyuki, Haga Noritoshi, Yamaguchi Yoko, Lee Soo-Young: The temporal structure of the memory storage in the theta phase precession model of the hippocampus, Proceedings of 7th International Conference on Neural Information Processing (ICONIP-2000), 1, 53-54, Taejon, Korea, 11, 2000