CURRICULUM VITAE

Dong Song

Department of Biomedical Engineering
Neuroscience Graduate Program
University of Southern California

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Professional Experience

2013–Present	Research Associate Professor Department of Biomedical Engineering University of Southern California, Los Angeles, California
2018–Present	Director of USC Neural Modeling and Interface Laboratory University of Southern California, Los Angeles, California
2017–Present	Faculty Member Neuroscience Graduate Program University of Southern California, Los Angeles, California
2006–Present	Co-Director of Laboratory of Neural Engineering University of Southern California, Los Angeles, California
2006–2013	Research Assistant Professor Department of Biomedical Engineering University of Southern California, Los Angeles, California
2004–2006	Post-Doctoral Research Associate Department of Biomedical Engineering University of Southern California, Los Angeles, California

Education

1999–2004	University of Southern California, Los Angeles Ph.D. degree: Biomedical Engineering Dissertation: *Parametric and non-parametric models of short-term synaptic plasticity* Advisor: Dr. Theodore W. Berger
1989–1994	University of Science and Technology of China, Hefei, China B.S. degree: Biological Sciences (Biophysics)

Scientific Consultant

2016–2017	Kernel LLC

Research Interests

- Hippocampal memory prosthesis
- Combined mechanistic and input-output modeling of the brain
- Experimental, theoretical and computational studies of the hippocampus
- Next generation neural interface technology

- Large-scale multi-region flexible conformal multi-electrode array
- Ultraminiaturized wireless bioelectronics systems for neural recording and stimulation

Honors and Awards

2020	Dornsife Neuroscience Faculty Award
2018	Young Investigator Award, Society for Brain Mapping and Therapeutics
2018	IEEE Senior Member, IEEE
2013	Outstanding Paper Award, IEEE Transactions on Neural Systems and Rehabilitation Engineering
2008	James H. Zumberge Individual Award, USC
2008	NIH/NIBIB EMBC08 conference support award, NIH Grant No. 1R3EB008957-01
2001	First Place Award for Platform Presentation, Fifth Annual Grodins Graduate Research Symposium, Department of Biomedical Engineering, University of Southern California
1992	Outstanding Student Award, University of Science and Technology of China, Hefei, China

Research Grants Received as PI, Co-PI, and Co-I

PI: Combined mechanistic and input-output modeling of the hippocampus during spatial navigation (1RF1DA055665, former 1R01EB031680), NIH/NIDA, RF1, $1,198,121, (PI: Song), 09/01/2021–08/31/2024.

PI: Sub-Award of “FMRP-mediated Regulation in Human Brain Development and Therapeutic Advancement (P50HD104458)”, NIH/NICHD, P50, $10,307,638 ($233,320, USC allocation), (MPI: Jin/Warren, Emory University, USC Sub-Award PI: Song), 12/01/2020–11/30/2025.

MPI: A Technology Resource for Polymer Microelectrode Arrays (1U24NS113647), NIH/NINDS, U24, $6,126,596, (MPI: Song, Contact PI: Meng), 09/30/2019–07/31/2024.

PI: Sub-Award of “Human Agency and Brain-Computer Interfaces: Understanding Users’ Experiences and Developing a Tool for Improved Consent (NOT-AG-20-008)”, NIH, RF1, $46,159, (PI: Goering, University of Washington, USC Sub-Award PI: Song), 09/01/2020–08/31/2021.

Co-PI: An Endovascular Device for Transvenous Electroencephalography, University of Southern California, Provost’s New Direction in Research and Scholarship Award (PNDRSA), $250,000, (PI: Meng), 12/30/2019–12/31/2021.

PI: INSPIRE: Bioelectronic Systems for Investigating Neural Plasticity (CBET-1343193), NSF, $2,999,995, (PI: Song), 08/15/2014–09/30/2020.

Joint PI: RAM: Development of a Human Memory Prosthetic (N66001-14-C-4016), Extension, DARPA, $121,800, (Joint PIs: Deadwyler, Hampson, Berger, Song), 07/01/2019–08/31/2020.

PI: Deep Learning for Hippocampal Spiking Activities, NVIDIA GPU Grant, $1,200, (PI: Song), 12/18/2017.

Joint PI: RAM: Development of a Human Memory Prosthetic (N66001-14-C-4016), DARPA, $4,812,860, (Joint PIs: Deadwyler, Hampson, Berger, Song), 12/21/2016–06/30/2019.

Co-PI: Flexible Neural Probe Arrays for Large-Scale Cortical and Subcortical Recording (1U01NS099703), NIH, U01, $1,206,249, (PI: Meng), 09/30/2016–06/30/2021.

Co-PI:Lyse-and-Attract Cuff Electrodes (LACE) (HR011-15-2-0005), DARPA, $663,806, (PI: Meng), 03/31/2015–03/31/2019.

Co-I: Predictive Modeling of Bioelectric Activity on Mammalian Multilayered Neuronal Structures in the Presence of Supraphysiological Electric Fields, NIH/NIBIB, U01 (9U01EB025830), $2,100,000, (Contact PI: Lazzi), 09/15/2018–05/31/2022.

Co-PI: Human Memory Prosthesis, Musk Foundation, (PI: Berger), 2016–2019.

Co-PI: Human Memory Prosthesis, OS Fund, (PI: Berger), 2016–2017.

Co-I: Predictive Modeling of Bioelectric Activity on Mammalian Multilayered Neuronal Structures in the Presence of Supraphysiological Electric Fields, NIH, U01 (U01GM104604), $2,041,888, (Contact PI: Lazzi, MPI: Berger), 09/15/2012–08/31/2017.

Co-I: A Nonlinear Model of Hippocampus, NIBIB Biomedical Simulations Resource (Resource Directors: Marmarelis and D'Argenio), 2013–2018

Co-PI: Follow-on REMIND Project for Development of a Human Memory Prosthetic (N66001-14-C-4016), DARPA, $774,053, (PIs: Deadwyler and Berger), 10/01/2015–03/31/2016.

Co-PI: Development of a Human Memory Prosthetic (N66001-14-C-4016), DARPA, $999,567, (PIs: Deadwyler and Berger), 10/01/2014–09/30/2015.

Co-PI: REMIND: Restorative Encoding Memory Integration Neural Device, Option II, DARPA, $2,388,408, (PIs: Deadwyler and Berger), 10/01/2012–09/30/2013.

Co-PI: REMIND: Restorative Encoding Memory Integration Neural Device, DARPA, $9,457,200, (PIs: Deadwyler and Berger), 10/01/2009–09/30/2012.

PI: Nonlinear Dynamic Modeling of Hippocampal System Function during Learned Behavior and Memory Formation, Zumberge Individual Award, USC, $27,000, 07/01/2008–06/30/2009.

Research Grants Participated as Senior Personnel

Senior Personnel: Engineering Research Center for Biomimetic MicroElectronics Systems (EEC-0310723), NSF, $17,000,000, (PI: Humayun), 2003–2013.

Senior Personnel: A Nonlinear Model of Hippocampus, NIBIB Biomedical Simulations Resource (5-P41-EB001978), $5,854,519, (Resource Directors: Marmarelis and D'Argenio), 2003–2013.

Non-Research Grants Received

Event Producer: Livewire—A Stimulating Night of Neurotechnology, USC Visions and Voices Grant, $20,901, (Event Producer: Song; Co-Producers: Flynn and Fletcher), 2020–2021.

PI: Narratives and Neural Implants: A Workshop on the Ethical Portrayal of Advanced Technologies, USC Annenberg Graduate Fellows Micro Seminar Series Research Grant, $2,500, (PI: Song), 09/27/2019.

Grant Reviews

2021	NSF, Integrative Strategies for Understanding Neural and Cognitive Systems (NCS)
2021	NSF, Graduate Research Fellowship Program (GRFP)
2020	NSF, Graduate Research Fellowship Program (GRFP)
2018	Medical Research Council (MRC), United Kingdom, Research Grant
2015	University of Texas Systems Neuroscience and Neurotechnology Research Institute Seed Grants (UT BRAIN)

Teaching as Sole Instructor

2018 BME 402: Control and Communication in the Nervous System (4.0 units), Biomedical Engineering, USC

2013 BME 402: Control and Communication in the Nervous System (3.0 units), Biomedical Engineering, USC

2012 BME 502: Advanced Studies of the Nervous System (4.0 units), Biomedical Engineering, USC

Teaching as Co-Instructor

BME 522: Neural Implant Engineering (4.0 units), Biomedical Engineering, USC, (2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021)

NSCI 525: Advanced Overview of Neurosciences II (4.0 units), Neuroscience Graduate Program, USC, (2019, 2020, 2021)

NEUR 524: Advanced Overview of Neuroscience (4.0 units), Neuroscience Graduate Program, USC, (2018, 2020)

Teaching as Guest Lecturer

MEDS 330: Bionics: Solutions to Enable the Disabled, USC, (2020)

Teaching Cognitive Psychology Through Science Fictions, University of California, Riverside, (2020, 2021)

BME 533: Seminar in Bioengineering, Biomedical Engineering, USC, (2015, 2020)

BME 452: Introduction to Biomimetic Neural Engineering, Biomedical Engineering, USC, (2007, 2008, 2009, 2012, 2014, 2015, 2019)

BME 201: Biomedical Engineering Practice, Biomedical Engineering, USC, (2013, 2018)

BME 599: Neural Implant Engineering, Biomedical Engineering, USC, (2005)

Postdoctoral Fellows Advised

Huijing Xu, 2020–present
Samuel Shin, 2015–2016
Min-Chin Hsiao, 2009–2016
Yi Guo, 2015–2016

Ph.D. Student Supervision

Haoyu Lan, 2021 (rotation)
Zhouxiao Lu, 2021–Present
Timothy Fanelle, 2020 (rotation)
Arthur Shao, 2019–2020 (rotation)
Christopher Girard, 2018–Present
Bryan Moore, 2018–Present
Zane Chou, 2017–2019
Sahar Elyahoodayan, 2016–2020
Shokofeh Naiini, 2015–2016 (rotation)
Jeffrey Tanedo, 2013–2014
Tassanai Parittotokkaporn , 2011
Gene Yu, 2011–2019
Shane Roach, 2010–2014
Phillip Hendrickson, 2005–2015
Ude Lu, 2005–2011
Hesam Azadjou, 2021 (rotation)
Kevin Delao, 2021 (rotation)
Xuechuan Wang, 2018 (rotation)
Haleh Akrami, 2018–Present
Wenxuan Jiang, 2017–Present
Xiwei She, 2016–Present
Clayton Bingham, 2015–2019
Andrea Ezis, 2014–2015 (rotation)
Sara Madaan, 2012–2013 (rotation)
Huijing Xu, 2011–2019
Brian Robinson, 2011–2016
Pen-Ning Yu, 2009–2020
Rosa H. M. Chan, 2005–2011
Min-Chi Hsiao, 2005–2009

Masters Student Supervision

Robert Sutherland, 2021
Jiaxin Zhou, 2020
Siddharth Bhonge, 2018–2019
Joomyung Song, 2015–2016
Shuang Wei, 2020
Amirhossein Forouzani, 2018–2019
Clayton Bingham, 2013–2015

Madhuri Harway, 2013–2014
Andrea Ezis, 2013–2014
Jonathan Arteaga, 2010
Nelson Jen, 2008
Adam Mergenthal, 2013–2014
Eric Cabral, 2010–2011
Samuel Felix, 2010
Alexandar Taghva, 2007–2009

Undergraduate Student Supervision

John Pace, 2021–Present
Kevin Shu, 2020–2021
Natalie Kistler, 2020–Present
Tiffani Szeto, 2018
Kevin Xu, 2012
Dea Flores, 2010
Nathalie H. Pelka, 2007–2009
Patrick Carriere, 2008
Yilei Dong, 2020–Present
Garrett Flynn, 2018–2021
Kang Woo Lee, 2012
Christopher Girard, 2011
Adam Baybutt, 2010
Nora Shnorhokian, 2007
Anne Huang, 2007
Zixin Chen, 2020
Betelhem Alemu, 2018
Allison Wilson, 2012
Richard Ponce, 2011
Alex Katz, 2010–2011
Andrew Barajas, 2008
Shengqi Ye, 2007

Highschool Student Supervision

Sophie Wang, 2020
Austen Yun, 2021
Kevin (Yiyan) Rao, 2020
Daniel Delgado, 2018
Diana Salcedo-Pierce, 2018
Molina Zhang, 2017–2018
Brian Li, 2016–2017
Jamie Chen, 2015
Bobby Zhu, 2021
Benjamin Hong, 2020
Miranda Zhang, 2019
Diego Domez-Ruiz, 2018
Alice Wang, 2018
Ryan Li, 2017 / 2019
Sophia Chen, 2016
Helen Song, 2015
Stephanie Wang, 2020
Elle Yokota, 2019
Gordon Giang, 2018
Tianyi Shao, 2018
Yeer Jin, 2017–2018
Jane Jing, 2016
Joanna Hao, 2014

Ph.D. Dissertation Committees

2020	Penning Yu	Chair	Biomedical Engineering, USC
2020	Sahar Elyahoodayan	Chair	Biomedical Engineering, USC
2020	Madison Longeuay	Committee	Biomedical Engineering, USC
2019	Enrique Arguelles	Committee	Biomedical Engineering, USC
2019	Huijing Xu	Chair	Biomedical Engineering, USC
2018	Gene Yu	Co-Advisor	Biomedical Engineering, USC
2018	Ahuva Weltman	Committee	Biomedical Engineering, USC
2016	Kunling Geng	Committee	Biomedical Engineering, USC
2016	Brian S. Robinson	Co-Advisor	Biomedical Engineering, USC
2015	Boshuo Wang	Committee	Biomedical Engineering, USC
2015	Phillip Hendrickson	Co-Advisor	Biomedical Engineering, USC
2015	Roman Sandler	Committee	Biomedical Engineering, USC
2014	Nadav Ivzan	Committee	Biomedical Engineering, USC
2013	Arvind Iyer	Committee	Biomedical Engineering, USC
2011	Rosa H. M. Chan	Co-Advisor	Biomedical Engineering, USC
2011	Ude Lu	Co-Advisor	Biomedical Engineering, USC
2009	Min-Chi Hsiao	Co-Advisor	Biomedical Engineering, USC

Ph.D. Qualifying Exam Committees

2021	Victoria Wolseley	Committee	Physiology and Biophysics, USC
2021	Xuechun Wang	Committee	Biomedical Engineering, USC
2021	Xiwei She	Chair	Biomedical Engineering, USC
2020	Penning Yu	Chair	Biomedical Engineering, USC
2020	Aria Samiei	Committee	Electrical Engineering, USC
2020	Chuanmeizhi Wang	Committee	Electrical Engineering, USC

2019	Eugene Yoon	Committee	Biomedical Engineering, USC
2019	Peter Luu	Committee	Biomedical Engineering, USC
2019	Sahar Eyahoodayan	Chair	Biomedical Engineering, USC
2018	Enrique Arguelles	Committee	Biomedical Engineering, USC
2017	Ahuva Weltman	Committee	Biomedical Engineering, USC
2017	Huijing Xu	Co-Advisor	Biomedical Engineering, USC
2017	Madison Zitting	Committee	Biomedical Engineering, USC
2017	Alex Baldwin	Committee	Biomedical Engineering, USC
2016	Gene Yu	Co-Advisor	Biomedical Engineering, USC
2015	Brian S. Robinson	Co-Advisor	Biomedical Engineering, USC
2015	Kunling Geng	Committee	Biomedical Engineering, USC
2014	Roman Sandler	Committee	Biomedical Engineering, USC
2014	Arvind Iyer	Committee	Biomedical Engineering, USC
2014	Boshuo Wang	Committee	Biomedical Engineering, USC
2013	Nadav Ivzan	Committee	Biomedical Engineering, USC
2013	Curtis D. Lee	Committee	Biomedical Engineering, USC
2013	Phillip Hendrickson	Co-Advisor	Biomedical Engineering, USC
2009	Rosa H. M. Chan	Co-Advisor	Biomedical Engineering, USC
2009	Ude Lu	Co-Advisor	Biomedical Engineering, USC

Services in Scientific Communities

2019–2021	Scientific Committee, Society for Brain Mapping and Therapeutics (SBMT)
2019	International Committee, International Symposium on Translational Research in Brain Stimulation, Institute of Science and Technology for Brain-Inspired Intelligence, Fudan University

Services in University

2021	USC BME Non-Tenure Track Faculty Merit Review Committee
2020	USC BME RTPC Faculty Appointment Renewal Review Committee
2020	USC BME Non-Tenure Track Faculty Merit Review Committee
2019	USC BME Screening Committee
2019	USC BME Faculty Merit Evaluation Committee
2016–2017	USC Engineering Faculty Council
2017	USC BME Non-Tenure Track Faculty Merit Review Committee

Affiliation in Scientific Societies

2017–present	Organization for Computational Neurosciences
2017–present	National Academy of Inventors
2017–present	Society for Brain Mapping and Therapeutics (SBMT)
2014–2015	International Chinese Statistical Association (ICSA), Member
2008–present	American Statistical Association (ASA), Member
2002–present	IEEE, Senior Member
2002–present	IEEE Engineering in Medicine and Biology Society (EMBS), Member
2002–present	Biomedical Engineering Society (BMES), Member
1999–present	Society for Neuroscience, Member

Editorial Roles

Associate Editor	Journal of Neuroscience Methods	2020–Present
Associate Editor	Frontiers in Neuroscience, Brain Imaging Methods	2019–Present
Guest Associate Editor	Frontiers in Neuroscience, Brain Imaging Methods	2019
Editorial Board Member	Journal of Neuroscience Methods	2018–Present

Guest Associate Editor	Frontiers in Neuroscience, Neuroprosthetics	2017–Present
Associate Editor	IEEE Engineering in Medicine and Biology Conference	2015–Present
Editor	Computational and Mathematical Methods in Medicine	2014–Present
Guest Associate Editor	Frontiers in Neurology	2013
Guest Associate Editor	Frontiers in Neuroscience	2013
Review Editor	Frontiers	2013–Present

Special Issues Edited

Methods for Interfacing with the Peripheral Nervous System, Journal of Neuroscience Methods, Managing Editor, 2018–2020

Futuristic Neural Prostheses, Frontiers in Neuroscience, Editor, 2016–2019

Journal, Conference and Book Refereeing

Behavioral Brain Research
Brain and Neuroscience Advances
Brain Research
Cancer Informatics
Cognitive Computation
Cognitive Neurodynamics
Cognitive Systems Research
Computational Intelligence and Neuroscience
Computational and Mathematical Methods in Medicine
Computers in Biology and Medicine
CRC Press Book Proposal
Entropy
Frontiers in Computational Neuroscience
Frontiers in Human Neuroscience
Frontiers in Physiology
Frontiers in Neuroengineering
Frontiers in Neuroscience
Frontiers in Systems Neuroscience
IEEE Signal Processing Letters
IEEE Transactions on Biomedical Engineering
IEEE Transactions on Circuits and Systems II
IEEE Transactions on Communications
IEEE Transactions on Control Systems Technology
IEEE Transactions on Emerging Topics in Computational Intelligence
IEEE Transactions on NanoBioscience
IEEE Transactions on Neural Systems and Rehabilitation Engineering
IEEE Transactions on Signal Processing
IEEE EMBC Annual Conference
IEEE EMBC Annual Conference on Neural Engineering
International Conference on Biomedical Engineering and Biotechnology
ISA Transactions
Journal of Computational Neuroscience
Journal of Indian Mathematical Society
Journal of Neurophysiology
Journal of Neuroscience Methods
Journal of Neural Engineering
Journal of Personalized Medicine
Journal of Process Control
Microelectronics Journal

Micromachines
Neural Computation
Neural Networks
Neurocomputing
Neuroscience Letters
Physica A: Statistical Mechanics and Its Applications
PLOS ONE
Progress in Neuro-Psychopharmacology & Biological Psychiatry
Scientific Reports
Synapse

Editorial Activities and Peer Review at Publons

https://publons.com/researcher/1541393/dong-song/

Invited Talks and Panel Discussions

Next-generation interface systems for supporting cortical prostheses. 2021 Society for Brain Mapping and Therapeutics, online, July 11, 2021.

Computational models for hippocampal memory prostheses. 2021 Society for Brain Mapping and Therapeutics, online, July 9, 2021.

Computational models and neural interfaces for hippocampal memory prostheses. Waterloo International Workshop on Neural Engineering and Rehabilitation, University of Waterloo, online, July 8, 2021.

Panelist on "Updating the Roadmap to Whole Brain Emulation, Neural Modeling, Part II", Carboncopies Foundation Workshop, online, March 28, 2021.

Computational models and neural interface technologies for hippocampal memory prostheses. Biomedical Engineering Seminar, American University of Beirut, online, March 8, 2021.

The past, present, and future of neural prostheses. Livewire: A Stimulating Night of Neurotechnology, USC Visions & Voices, online, March 5, 2021.

Panelist on "Updating the Roadmap to Whole Brain Emulation, Neural Modeling, Part I", Carboncopies Foundation Workshop, online, December 20, 2020.

Interface with the nervous system. Monthly Bridge Faculty Research Forum, USC Michelson Center, Bridge Institute, February 19, 2020.

Computational models and neural interface technologies for hippocampal memory prostheses. International Symposium on Translational Research in Brain Stimulation, Fudan University, Shanghai, China, November 09, 2019.

Narratives and neural implants: a workshop on the ethical portrayal of advanced technologies. University of Southern California Annenberg Graduate Fellows Micro Seminar Series, Los Angeles, USA, September 27, 2019.

Panelist on "Updating the roadmap to whole brain emulation, part 2: where we go from here", Carboncopies Foundation 2019 Summer Event, online, September 21, 2019.

Hippocampus, episodic memory, and hippocampal memory prosthesis. Grand Rounds Conference, Harbor UCLA Medical Center, Neurology Department, Los Angeles, USA, September 06, 2019.

Input-output modeling of the hippocampus for developing memory prostheses. IEEE EMBC Conference Invited Session on Neural Coding and Rehabilitation Using Brain-Machine Interfaces, Berlin, Germany, July 26, 2019.

Computational models for hippocampal memory prosthesis. IAS Workshop on Neural Engineering and Rehabilitation, Hong Kong University of Science and Technology, Hong Kong, China, June 3, 2019.

Building hippocampal prosthesis based on computational modeling of memory codes. Carboncopies Workshop on: Roadmap on Whole Brain Emulation, online, June 1, 2019.

Panelist on "Why not craft better humans?", Moral Code Conference, Thomas Mann House and UCLA, Los Angeles, USA, May 28, 2019,

Input-output modeling (machine learning) for hippocampal memory prosthesis. 2019 Society for Brain Mapping and Therapeutics, Los Angeles, USA, March 15, 2019.

Hippocampal memory prosthesis. Institute of Science and Technology for Brain-Inspired Intelligence, Fudan University, Shanghai, China, February 21, 2019.

Building hippocampal memory prosthesis. University of Southern California Nu Pho Psi Guest Lecture Series, Los Angeles, USA, February 7, 2019.

Panelist on "Almost total recall—the science and ethics of brain implants", USC Sidney Harman Academy for Polymathic Study, Los Angeles, USA, November 8, 2018.

Toward a clinical hippocampal memory prosthesis. Jinan Qilu Hospital, Jinan, China, September 27, 2018.

Toward a clinical hippocampal memory prosthesis. International Symposium on Translational Research in Brain Stimulation, Fudan University, Shanghai, China, September 20, 2018.

Toward a clinical hippocampal memory prosthesis. Carboncopies Workshop on: From Brain Preservation to Reconstruction, San Francisco, USA, April 29, 2018.

Nonlinear dynamical modeling for hippocampal memory prosthesis. 2018 Society for Brain Mapping and Therapeutics, Los Angeles, USA, April 14, 2018.

Computational models of the hippocampus for memory prostheses. 2017 International Conference on Brain and Brain-Inspired Science, Qingdao, China, Aug 12, 2017.

Building hippocampal prostheses for restoring and enhancing memory functions. School of Computer Science and Technology, Shandong University, Jinan, China, Aug 08, 2017.

Understanding and facilitating neural codes underlying memory. DBS Think Tank V, Atlanta, USA, May 20, 2017.

Engineering memories: a brain-implantable cognitive prosthesis to restore human memory. Berger, T.W., and Song, D. Jinan Qilu Hospital, Jinan, China, March 14, 2017.

Engineering memories: a brain-implantable cognitive prosthesis to restore human memory. Berger, T.W., and Song, D. Jinan Qilu Hospital, Qingdao, Qingdao, China, March 15, 2017.

Engineering memories: a brain-implantable cognitive prosthesis to restore human memory. Berger, T.W., and Song, D. Sanbo Hospital, Beijing, China, March 16, 2017.

Engineering memories: a brain-implantable cognitive prosthesis to restore human memory. Berger, T.W., and Song, D. The 304 Hospital of the PLA, Beijing, China, March 17, 2017.

Recent progress in brain research and neural engineering. Jinan Central Hospital, Jinan, China, May 24, 2016.

Understand brain functions from spikes: a nonlinear dynamical system identification approach. Computational Neuroscience (CNS) 2015 Workshop on: Methods of System Identification for Studying Information Processing in Sensory Systems, Prague, Czech Republic, July 22, 2015.

Building hippocampal memory prosthesis. Keynote Speech at 1st MMVR/IFCARS Joint Conference on Human Machine Interface, Computer Assisted Radiology and Surgery (CARS) 2015, 29th International Congress and Exhibition, Barcelona, Spain, June 24, 2015.

Hippocampal memory prostheses. Jinan Central Hospital, Jinan, China, May 20, 2015.

Identification of synaptic learning rule from ensemble spiking activities. 2014 ICSA/KISS Applied Statistics Symposium, Portland, USA, 2014.

Nonlinear dynamic modeling of neural population activity for the development of hippocampal prostheses. Institute of Biomedical and Health Engineering, Shenzhen Institutes of Advanced Technology, Shenzhen, China, Jan 4, 2013.

Functional and mechanistic modeling of the hippocampal neuronal network. Society for Neuroscience Satellite Symposium on Whole Brain Circuit Reconstruction, New Orleans, USA, Oct 16, 2012.

Nonlinear dynamic modeling of neural population activity for the development of hippocampal prostheses. Neural Interface & Rehabilitation Tech Research Center, Huazhong University of Science and Technology, Wuhan, China, Dec 6, 2011.

Nonlinear Modeling of neural population dynamics for hippocampal prostheses. Department of Statistics, Colorado State University, Fort Collins, USA, March 29, 2010.

Multiple-input multiple-output nonlinear dynamic models of spike train transformation for hippocampal prostheses. IJCNN Workshop on Innovation in Computational Approaches for Brain-Machine Interfaces, Orlando, USA, August 17, 2007.

Chairing and Organization of Sections in Scientific Meetings

2021 Organizing Chair of the "Neural Engineering III: Computational Models for Neural Prosthesis" session at the Society for Brain Mapping and Therapeutics 17 Annual Congress, Los Angeles, USA.

2021 Organizing Chair of the "Neural Engineering VII: New Neural Interface for Recording and Stimulation" session at the Society for Brain Mapping and Therapeutics 17 Annual Congress, Los Angeles, USA.

2020 Program Committee of "HBAI 2020: Joint Workshop on Human Brain and Artificial Intelligence", Yokohama, Japan.

2019 Chair of Session IV at the IAS Workshop on Neural Engineering and Rehabilitation, The Hong Kong University of Science and Technology, Hong Kong, China, 2019.

2019 Chair of the "Bionic Brain" session at the Society for Brain Mapping and Therapeutics 16 Annual Congress, Los Angeles, USA.

2018 Chair of the "Time-Frequency Analysis of Neural Signals" session at the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology, Honolulu, USA.

2018 Co-Chair of the "Signal Processing and Classification for BCIs and Motor Imagery" session at the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology, Honolulu, USA.

2017 Session Chair of the 2017 International Conference on Brain and Brain-Inspired Science, Qingdao, China.

2017 Co-Chair of the "Implantable Sensors I" session at the 39th Annual International Conference of the IEEE Engineering in Medicine and Biology, Jeju Island, Korea.

2015 Chair of the "Brain Physiology and Modeling II" session at the 37th Annual International Conference of the IEEE Engineering in Medicine and Biology, Milan, Italy.

2014 Co-Organizer (with Dr. Haonan Wang) of the "Statistical Analysis on Massive Data from Point Processes" session at the 2014 Joint Applied Statistics Symposium of International Chinese Statistical Association (ICSA) and Korean International Statistical Society (KISS), Portland, Oregon.

2012 Chair of the "Brain Physiology and Modeling I" session at the 34th Annual International Conference of the IEEE Engineering in Medicine and Biology, San Diego, California.

2012 Co-Chair of the "Epilepsy" session at the 34th Annual International Conference of the IEEE Engineering in Medicine and Biology, San Diego, California.

2011 Organizer (with Dr. Haonan Wang) of the "Statistical Modeling of Neural Spikes" session at the 2011 Joint Statistical Meetings, Miami Beach, Florida.

Patents

1. Closed-Loop Multi-Channel Asynchronous Neurostimulator to Mimic Neural Code for Cognitive Prosthesis. Inventors, Song, D., Berger, T.W., and Elyahoodayan, S. US Patent App. 16/656,478, 2020.
2. Apparatus and Method for Decoding and Restoring Cognitive Functions. Inventors, Song, D., and Berger, T.W. Publication No.: WO2019035887A1, US Patent App. 16/639,556, 2020.
3. Non-Stationary MIMO Model for Prostheses. Inventors, Song, D., Robinson, B.S., and Berger, T.W. U.S. Publication No.: US2018/0357529 A1, US Patent App. 16/005,613, 2018.
4. A Closed-Loop Multi-Channel Asynchronous Neurostimulator to Mimic Neural Code for Cognitive Prosthesis. Inventors, Song, D., Berger, T.W., and Elyahoodayan, S. Provisional filing date: Oct 17, 2018.
5. Large-Scale Sparse MIMO for Prostheses. Inventors, Song, D., and Berger, T.W. Provisional filing date: Aug 16, 2017.
6. Memory Decoding Model for Prostheses. Inventors, Song, D., and Berger, T.W. Provisional filing date: Aug 16, 2017.
7. Modeling Nonlinear Systems. Inventors: Song, D., Marmarelis, V.Z., and Berger, T.W. US Patent No.: US 8,463,582 B2, Date of Patent: Jun 11, 2013.

Publications–List of Published Work at Google Scholar

https://scholar.google.com/citations?user=noJkQ7wAAAAJ&hl=en

Publications–Peer-Reviewed Journal Articles

1. She, X., Robinson, B.S., Flynn, G., Berger, T.W., and Song, D. Accelerating input-output model estimations with parallel computing for testing hippocampal memory prostheses in human. *Under review*.
2. She, X., Berger, T.W., and Song, D. A double-layer multi-resolution classification model for decoding spatio-temporal patterns of spikes. Neural Computation, 2021, *In Press*.
3. Ammothumkandy, A., Ravina, K., Wolseley, V., Tartt, A.N., Yu, P-N., Corona, L., Zhang, N., Nune, G., Kalayjian, L., Mann, J.J., Rosoklija, G.B., Arango, V., Dwork, A.D., Lee, B., Smith, J.A.D., Song, D., Berger, T.W., Heck, C.N., Chow, R.H., Boldrini, M., Liu, C.Y., Russin, J.J., and Bonaguidi, M.A. Altered adult neurogenesis and gliogenesis in mesial temporal lobe epilepsy patients. Nature Neuroscience, 2021, *In Press*.
4. Elyahoodayan, S., Jiang, W., Lee, C., Shao, A., Weiland, G., Whalen, J., Petrossians, A., and Song, D. Stimulation and recording of the hippocampus using the same Pt-Ir Coated Microelectrodes. Frontiers in Neuroscience, 2021, DOI: 10.3389/fnins.2021.616063.
5. Yu, P-N., Liu, C.Y., Heck, C.N., Berger, T.W. and Song, D. A Sparse multiscale nonlinear autoregressive model for seizure prediction. Journal of Neural Engineering, 2021, DOI: 10.1088/1741-2552/abdd43.
6. Chowdhury, M.H., Elyahoodayan, S., Song, D., and Cheung, R.C.C. An FPGA-based neuron activity extraction unit for wireless neural interface. Electronics, 2020, 9(11), 1834, DOI: 10.3390/electronics9111834.
7. Bingham, C.S., Paknahad, J., Girard, C.B.C., Loizos, K., Bouteiller, J-M.C., Song, D., Gianluca, L., and Berger, T.W. Admittance method for estimating local field potentials generated in a multi-scale neuron model of the hippocampus. Frontiers in Computational Neuroscience, 2020, DOI: 10.3389/fncom.2020.00072.

8. Scholten, K., Larson, C., Xu, H., Song, D., and Meng, E. A 512-channel multi-layer polymer-based neural probe array. IEEE Journal of Microelectromechanical Systems, 2020, 29(5), 1054-1058, DOI: 10.1109/JMEMS.2020.2999550.

9. Wang, X., Hirschberg, A.W., Xu, H., Slingsby-Smith, Z., Lecomte, A., Scholten, K., Song, D., and Meng, E. A Parylene neural probe array for multi-region deep brain recordings. IEEE Journal of Microelectromechanical Systems, 2020, 29(4), 499-513, DOI: 10.1109/JMEMS.2020.3000235.

10. Scholten, K., Meng, E., Knaack, G., and Song, D. Editorial: interfacing with the peripheral nervous system. Journal of Neuroscience Methods, 2020, 340, 108745, DOI: 10.1016/j.jneumeth.2020.108745.

11. Elyahoodayan, S., Larson, C., Cobo, A., Meng, E., and Song, D. Acute *in vivo* testing of a polymer cuff electrode with integrated microfluidic channels for stimulation, recording, and drug delivery on rat sciatic nerve. Journal of Neuroscience Methods, 2020, 336, 108634, DOI: 10.1016/j.jneumeth.2020.108634.

12. Bingham, C.S., Mergenthal, A., Bouteiller, J-M.C., Song, D., Gianluca, L., and Berger, T.W. ROOTS: An algorithm to generate biologically realistic cortical axons and an application to electroceutical modeling. Frontiers in Computational Neuroscience, 2020, DOI: 10.3389/fncom.2020.00013.

13. Elyahoodayan, S., Jiang, W., Xu, H., and Song, D. A multi-channel asynchronous neurostimulator with artifact suppression for neural code-based stimulations. Frontiers in Neuroscience, 2019, DOI: 10.3389/fnins.2019.01011.

14. Geng, K., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. Multi-input, multi-output neuronal mode network approach to modeling the encoding dynamics and functional connectivity of neural systems. Neural Computation, 2019, 31, 1-29, DOI: 10.1162/NECO_a_01204.

15. Yu, G., Bouteiller J-M.C., Song, D., and Berger, T.W. Axonal anatomy optimizes spatial encoding in the rat entorhinal-dentate system: a computational study. IEEE Transactions on Biomedical Engineering, 2019, 66(10), 2728-2739, DOI: 10.1109/TBME.2019.2894410.

16. Cobo, A.M., Larson, C., Scholten, K., Miranda, J.A., Elyahoodayan, S., Song, D., Pikov, V., and Meng, E. Parylene-based cuff electrode with integrated microfluidics for peripheral nerve recording, stimulation and drug delivery. Journal of Microelectromechanical Systems, 2019, 38, 36-49, DOI: 10.1109/JMEMS.2018.2881908.

17. Hu E., Bouteiller J-M.C., Song D., and Berger T.W. Simulated postsynaptic calcium dynamics using an integrated model of spine properties, membrane channels, and pumps: validation, and an extension towards multi-scale calcium modeling. Frontiers in Computational Neuroscience, 2018, DOI: 10.3389/fncom.2018.00058.

18. Qiao, Z., Han, Y., Han, X., Xu, H., Li, W.X.Y., Song, D., Berger, T.W., and Cheung, R.C.C. ASIC implementation of a nonlinear dynamical model for hippocampal prosthesis. Neural Computation, 2018, 30, 2472-2499, DOI:10.1162/neco_a_01107.

19. Hampson, R.E., Song, D., Robinson, B.S., Fetterhoff, D., Dakos, A.S., Roeder, B.M., Wicks, R.T., Witcher, M.R., Couture, D.E., Laxton, A.W., Munger-Clary, H., Popli, G., Sollman, M.J., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. A hippocampal neural prosthetic for restoration of human memory function. Journal of Neural Engineering, 2018, 15, 036014, DOI: 10.1088/1741-2552/aaaed7.

20. Song, D., Robinson, B.S., Hampson, R.E., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Sparse large-scale nonlinear dynamical modeling of human hippocampus for memory prostheses. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2018, 26(2), 272-280, DOI: 10.1109/TNSRE.2016.2604423.

21. Bingham, C.S., Loizos, K., Yu, G., Gilbert, A., Bouteiller, J-M.C., Song, D., Gianluca, L., and Berger, T.W. Model-based analysis of electrode placement and pulse amplitude for hippocampal stimulation. IEEE Transactions on Biomedical Engineering, 2018, DOI: 10.1109/TBME.2018.2791860.

22. Ramirez-Zamora, A., Giordano, J., Gunduz, A., Brown, P., Sanchez, J., Foote, K.D., Almeida, L., Starr, P., Bronte-Stewart, H.M., Hu, W., McIntyre, C., Goodman, W., Kumsa, D., Grill, W.M., Walker, H., Johnson, M., Vitek, J.L., Greene, D., Rizzuto, D.S., Song, D., Berger, T.W., Hampson, R.E., Deadwyler, S.A., Hochberg, L., Schiff, N., Stypulkowski, P., Worrell, G., Tiruvadi, V., Mayberg, H., Jimenez-Shahed, J., Pranav, N., Sheth, S., Gross, R., Lempka, S.F., Deeb, W., and Okun, M.S. Evolving applications, technological challenges and future opportunities in neuromodulation: Proceedings of the Fifth Annual Deep Brain Stimulation Think Tank. Frontiers in Neuroscience, 2018, DOI: 10.3389/fnins.2017.00734.

23. Xu, H., Hirschberg, A.W., Scholten, K., Berger, T.W., Song, D., and Meng, E. Acute *in vivo* testing of a conformal polymer microelectrode array for multi-region hippocampal recording. Journal of Neural Engineering, 2018, 15, 016017, DOI: 10.1088/1741-2552/aa9451.

24. Geng, K., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. Mechanism-based and input-output modeling of the key neuronal connections and signal transformations in the CA3-CA1 regions of the hippocampus. Neural Computation, 2017, 30, 149-183, DOI: 10.1162/NECO_a_01031.

25. Sienkiewicz, E., Song, D., Breidt, F.J., Wang, H. Sparse functional dynamical model—a big data approach. Journal of Computational and Graphical Statistics, 2017, 26(2), 319-329, DOI: 10.1080/10618600.2016.1222292.

26. Robinson, B.S., Berger, T.W., and Song, D. Identification of stable spike-timing-dependent plasticity from spiking activity with generalized multilinear modeling. Neural Computation, 2016, 28:11, 2320-2351, DOI: 10.1162/NECO_a_00883.

27. Deadwyler, S.A., Hampson, R.E., Song, D., Opris, I., Gerhardt, G.A., Marmarelis, V.Z., and Berger, T.W. A cognitive prosthesis for memory facilitation by closed-loop functional ensemble stimulation of hippocampal neurons in primate brain. Experimental Neurology, 2016, DOI: 10.1016/j.expneurol.2016.05.031.

28. Li, W.X.Y., Cheung, R.C.C., Xin, Y., Song, D., and Berger, T.W. An FPGA-based high-performance neural ensemble spiking activity simulator utilizing generalized Volterra kernel and complexity analysis. Journal of Circuits, Systems, and Computers, 2016, 25(1), 164004.

29. Hendrickson, P., Yu, G., Song, D., and Berger, T.W. Interactions between inhibitory interneurons and excitatory associational circuitry in determining spatio-temporal dynamics of hippocampal dentate granule cells: a large-scale computational study. Frontiers in Systems Neuroscience, 2015, DOI: 10.3389/fnsys.2015.00155.

30. Opris, I., Santos, L., Gerhardt, G.A., Song, D., Berger, T.W., Hampson, R.E., and V.Z., Deadwyler, S.A. Distributed encoding of spatial and object categories in primate hippocampal microcircuits. Frontiers in Neuroscience, 2015, DOI: 10.3389/fnins.2015.00317.

31. Hu, E, Bouteiller, J-M.C., Song, D., Baudry, M., and Berger, T.W. Volterra representation enables modeling of complex synaptic nonlinear dynamics in large-scale simulations. Frontiers in Computational Neuroscience, 2015, DOI: 10.3389/fncom.2015.00112.

32. Sandler, R., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. Hippocampal closed-loop modeling and implications for seizure stimulation design. Journal of Neural Engineering, 2015, 12, 056017.

33. Hendrickson, P., Yu, G., Song, D., and Berger, T.W. A million-plus neuron model of the hippocampal dentate gyrus: critical role for topography in determining spatio-temporal network dynamics. IEEE Transactions on Biomedical Engineering, 2015, 63, 199-209. DOI: 10.1109/TBME.2015.2445771.

34. Song, D., Chan, R.H.M., Robinson, B.S., Marmarelis, V.Z., Opris, I., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Identification of functional synaptic plasticity from spiking activities using nonlinear dynamical modeling. Journal of Neuroscience Methods, 2015, 244, 123-135, DOI: 10.1016/j.jneumeth.2014.09.023.

35. Hsiao, M-C., Yu, P-N., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. An *in vitro* seizure model from human hippocampal slices using multi-electrode arrays. Journal of Neuroscience Methods, 2015, 244, 154-163, DOI: 10.1016/j.jneumeth.2014.09.010.

36. Xin, Y., Li, W.X.Y., Zhang, Z., Cheung, R.C.C., Song, D., and Berger, T.W. An application specific instruction set processor (ASIP) for adaptive filters in neural prosthetics. IEEE/ACM Transactions on Computational Biology and Bioinformatics, 2015, DOI: 10.1109/TCBB.2015.2440248.

37. Ghaderi, V., Song, D., Choma, J., and Berger, T.W. Nonlinear cognitive signal processing in ultra-low-power programmable analog hardware. IEEE Transaction on Circuits and Systems II, 2015, 62(2), 124-128.

38. Deadwyler, S.A., Berger, T.W., Opris, I., Song, D., and Hampson, R.E. Neurons and networks organizing and sequencing memories. Brain Research, 2015, DOI: 10.1016/j.brainres.2014.12.037.

39. Song, D., Harway, M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Extraction and restoration of hippocampal spatial memories with nonlinear dynamical modeling. Frontiers in Systems Neuroscience, 2014, DOI: 10.3389/fnsys.2014.00097.

40. Sandler, R., Deadwyler, S.A., Hampson, R.E., Song, D., Berger, T.W., and Marmarelis, V.Z. System identification of point-process neural systems using probability based Volterra kernels. Journal of Neuroscience Methods, 2015, 179-192, DOI: 10.1016/j.jneumeth.2014.11.013.

41. Sandler, R., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. Model-based assessment of an in-vivo predictive relationship from CA1 to CA3 in the rodent hippocampus. Journal of Computational Neuroscience, 2015, 38, 89-103, DOI: 10.1007/s10827-014-0530-8.

42. Xin, Y., Li, W.X.Y., Cheung, R.C.C., Chan, R.H.M., Yan, H., Song, D., and Berger, T.W. An FPGA based scalable architecture of a stochastic state point process filter (SSPPF) to track the nonlinear dynamics underlying neural spiking. Microelectronics Journal, 2014, 45(6), 690-701.

43. Song, D., Wang, H., Tu, C.Y., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Identification of sparse neural functional connectivity using penalized likelihood estimation and basis functions. Journal of Computational Neuroscience, 2013, 35, 335-357.

44. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. On parsing the neural code in the prefrontal cortex of primates using principle dynamic modes. Journal of Computational Neuroscience, 2013, DOI: 10.1007/s10827-013-0475-3.

45. Deadwyler, S.A., Berger, T.W., Sweat, A., Song, D., Chan, R.H.M., Opris, I., Gerhardt, G.A., Marmarelis, V.Z., and Hampson, R.E. Donor/recipient enhancement of memory in rat hippocampus. Frontiers in Systems Neuroscience, 2013, DOI: 10.3389/fnsys.2013.00120.

46. Hampson, R.E., Song, D., Opris, I., Santos, L., Shin, D., Gerhardt, G.A., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Facilitation of memory encoding in primate hippocampus by a neuroprosthesis that promotes task specific neural firing. Journal of Neural Engineering, 2013, 10, 066013.

47. Opris, I., Santos, L., Gerhardt, G.A., Song, D., Berger, T.W., Hampson, R.E., and V.Z., Deadwyler, S.A. Prefrontal cortical microcircuits bind perception to executive control. Scientific Reports, 2013, DOI: 10.1038/srep02285.

48. Li, W.X.Y., Chan, R.H.M., Song, D., Berger, T.W., and Cheung, R.C.C. Real-time prediction of neuronal population spiking activity using FPGA. IEEE Transactions on Biomedical Circuits and Systems, 2013, 7, 489-498.

49. Hsiao, M-C., Song, D., and Berger, T.W. Nonlinear dynamical model based control of in vitro hippocampal output. Frontiers in Neural Circuits, 2013, 7: Article 20, 1-14.

50. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear modeling of dynamic interactions within neuronal ensembles using principal dynamic modes. Journal of Computational Neuroscience, 2013, 34(1): 73-87.

51. Marmarelis, V.Z., Shin, D., Hampson, R.E., Deadwyler, S.A., Song, D., and Berger, T.W. Design of optimal stimulation patterns for neuronal ensembles based on Volterra-type hierarchical modeling. Journal of Neural Engineering, 2012, 9, 066003.

52. Berger, T.W., Song, D., Chan, R.H.M., Shin, D., Marmarelis, V.Z., Hampson, R.E., Sweatt, A.J., Heck, C.N., Liu, C.Y., Wills, J., LaCoss, J., Granacki, J.J., Gerhardt, G.A., and Deadwyler, S.A. Role of the hippocampus in memory formation: restorative encoding memory integration neural device as a cognitive neural prosthesis. IEEE Pulse, 2012, 3(5): 17-22.

53. Hampson, R.E., Gerhardt, G.A., Marmarelis, V.Z., Song, D., Opris, I., Santos, L., Berger, T.W., Deadwyler, S.A. Facilitation and restoration of cognitive function in primate prefrontal cortex by a neuroprosthesis that utilizes minicolumn-specific neural firing. Journal of Neural Engineering, 2012, 9(5): 056012.

54. Hampson, R.E., Song, D., Chan, R.H.M., Sweatt, A.J., Riley, M., Goonawardena, A., Marmarelis, V.Z., Gerhardt, G.A., Berger, T.W., and Deadwyler, S.A. Closing the loop for memory prostheses: detecting the role of hippocampal neural ensembles using nonlinear models. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2012, 20(4): 510-525.

55. Berger, T.W., Song, D., Chan, R.H.M., Marmarelis,V.Z., LaCoss, J., Wills, J., Hampson, R.E., Deadwyler, S.A., and Granacki, J.J. A hippocampal cognitive prosthesis: Multi-input, multi-output nonlinear modeling and VLSI implementation. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2012, 20(2): 198-211.

56. Hampson, R.E., Song, D., Chan, R.H.M., Sweatt, A.J., Fuqua, J., Gerhardt, G.A., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. A nonlinear model for cortical prosthetics: memory facilitation by hippocampal ensemble stimulation. IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2012, 20(2): 184-197.

57. Taghva, A., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Determination of relevant neuron-neuron connections for neural prosthetics using time-delayed mutual information: Tutorial and preliminary results. World Neurosurgery, 2012, doi: 10.1016/j.wneu.2011.09.002.

58. Lu, U., Roach, S.M., Song, D., and Berger, T.W. Nonlinear dynamic modeling of neuron action potential threshold during synaptically-driven broadband intracellular activity. IEEE Transactions on Biomedical Engineering, 2012, 59, 706-716.

59. Li, W.X.Y., Chan, R.H.M., Zhang, W., Cheung, R.C.C., Song, D., and Berger, T.W. High-performance and scalable system architecture of generalized Laguerre-Volterra MIMO models for neural population spiking activities. IEEE Journal on Emerging and Selected Topics in Circuits and Systems, 2011, 1(4): 489-501.

60. Berger, T.W., Hampson, R.E., Song, D., Goonawardena, A., Marmarelis, V.Z., and Deadwyler, S.A. A cortical neural prosthesis for restoring and enhancing memory. Journal of Neural Engineering, 2011, 8, 046017.

61. Hampson, R.E., Sweatt, A.J., Goonawardena, A.V., Song, D., Chan, R.H.M., Berger, T.W., and Deadwyler, S.A. Memory encoding in hippocampus is negatively influenced by cannabinoid CB1 receptors. Behavioural Pharmacology, 2011, 22(4): 335-346.

62. Lu, U., Song, D., and Berger, T.W. Nonlinear dynamic modeling of synaptically driven single hippocampal neuron intracellular activity. IEEE Transactions on Biomedical Engineering, 2010, 58, 1303-1313.

63. Berger, T.W., Song, D., Chan, R.H.W., and Marmarelis, V.Z. The neurobiological basis of cognition: Identification by multi-input, multi-output nonlinear dynamic modeling. Proceedings of the IEEE, 2010, 98, 356-374.

64. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear modeling of neural population dynamics for hippocampal prostheses. Neural Networks, 2009, 22, 1340-1351.

65. Song, D., Marmarelis, V.Z., and Berger, T.W. Parametric and non-parametric modeling of short-term synaptic plasticity. Part I: Computational study. Journal of Computational Neuroscience, 2009, 26, 1-19.

66. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Parametric and non-parametric modeling of short-term synaptic plasticity. Part II: Experimental study. Journal of Computational Neuroscience, 2009, 26, 21-37.

67. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamic modeling of spike train transformations for hippocampal-cortical prostheses. IEEE Transactions on Biomedical Engineering, 2007, 54, 1053-1066.

68. Gholmieh, G., Soussou, W., Han, M., Ahuja, A., Hsiao, M.-C., Song, D., Tanguay, Jr., A.R., and Berger, T.W. Custom-designed, high-density conformal planar multielectrode arrays for brain slice electrophysiology. Journal of Neuroscience Methods, 2006, 152, 116-129.

69. Berger, T.W., Ahuja, A., Courellis, S.H., Deadwyler, S.A., Erinjippurath, G., Gerhardt, G.A., Gholmieh, G, Granacki, J.J., Hampson, R., Hsiao, M-C., LaCoss, J., Marmarelis, V.Z., Nasiatka, P., Srinivasan, V., Song, S., Tanguay, Jr., A.R., and Wills, J. Restoring lost cognitive function: Hippocampal-cortical neural prostheses. IEEE Engineering in Medicine and Biology Magazine, 2005, 24, 30-44.

70. Song, D., Wang, Z., and Berger, T.W. Contribution of T-type VDCCs to TEA-induced long-term synaptic modification in hippocampal CA1 and dentate gyrus. Hippocampus, 2002, 12, 689-697.

71. Wang, Z., Song, D., and Berger, T.W. Contribution of NMDA receptor-channels to the expression of LTP in the hippocampal dentate gyrus. Hippocampus, 2002, 12, 680-688.

72. Song, D., Xie, X., Wang, Z., and Berger, T.W. Differential effect of TEA on long-term synaptic modification in hippocampal CA1 and dentate gyrus *in vitro*. Neurobiology of Learning and Memory, 2001, 76, 375-387.

Publications–Book Chapters

1. Elyahoodayan, S., Jiang, W., Xu, H., and Song, D. Neurostimulator for hippocampal memory prosthesis. In Opris, I., Lebedev, M., and Casanova, M. (Eds.), Modern Approaches to Augmentation of Brain Function. Berlin: Springer Nature, 2021, 39-56.

2. Song, D., Robinson, B.S., Chan, R.H.M., and Berger, T.W. Identification of Neural plasticity from spikes. In Manahan-Vaughan, D. (Ed.), Handbook of *in vivo* Neural Plasticity Techniques. Amsterdam: Elsevier, 2018, 135-151.

3. Song, D., Robinson, B.S., and Berger, T.W. Identification of short-term and long-term functional synaptic plasticity from spiking activities. In Comminiello, D., and Principe, J.C. (Eds.), Adaptive Learning Methods for Nonlinear System Modeling. Amsterdam: Elsevier, 2018, 289-312.

4. Yu, G.J., Hendrickson, P.J., Song, D., and Berger, T.W. Spatio-temporal patterns of granule cell activity revealed by a large-scale, biologically realistic model of the hippocampal dentate gyrus. In: Hippocampal Microcircuits, Vol. II (Eds. Cutsuridis V., Graham B.P., Cobb S., and Vida I.), New York: Springer, 2018, *in press*.

5. Song, D., and Berger, T.W. Nonlinear dynamical modeling for hippocampal memory prostheses. In Prescott, T., Lepora, N., and Verschure, P. (Eds.), Living Machines: A Handbook of Research in Biomimetic and Biohybrid Systems. Oxford: Oxford University Press, 2018, Section IV, 55.

6. Song, D., and Berger, T.W. Characterization of complex brain functions with sparse nonlinear dynamical modeling. In Opris, I., and Casanova, M. (Eds.), The Physics of the Mind and Brain Disorders—Integrated Neural Circuits Supporting the Emergence of Mind. New York, NY: Springer, 2017, 527-543.

7. Song, D., Hsiao, M-C., Opris, I., Hampson, R.E., Marmarelis, V.Z., Gerhardt, G.A., Deadwyler, S.A., and Berger, T.W. Hippocampal microcircuits, functional connectivity, and prostheses. In Opris, I., and Casanova, M. (Eds.), Recent Advances in the Modular Organization of the Cerebral Cortex. New York, NY: Springer, 2015, 385-405.

8. Deadwyler, S.A., Opris, I., Santos, L.M., Hampson, R.E., Gerhardt, G.A., Song, D., Marmarelis, V.Z., Berger, T.W. Extraction of cortical modularity patterns for neural prosthetics. In Opris, I., and Casanova, M. (Eds.), Recent Advances in the Modular Organization of the Cerebral Cortex. New York, NY: Springer, 2015, 367-384.

9. Li, W.X.Y., Chan, R.H.M., Zhang, W., Cheung, R.C.C., Song, D., and Berger, T.W. High-performance and scalable system architecture for hippocampal neural firing activity prediction based on FPGAs. In Vanderbauwhede W., and Benkrid, K. (Eds.), High-Performance Computing using FPGAs, New York, NY: Springer, 2013, 177-207.

10. Berger, T.W., Song, D., Chan, R.H.M., Marmarelis,V.Z., LaCoss, J., Wills, J., Granacki, J.J., Gerhardt, G.A., Hampson, R.E., and Deadwyler, S.A. Reverse Engineering the Brain: A Hippocampal Cognitive Prosthesis for Repair and Enhancement of Memory Function. In He, B. (Ed.), Neural Engineering. New York, NY: Springer, 2013, 725-764.

11. Tu, C.Y., Song, D., Breidt, F.J., Berger, T.W., and Wang, H. Functional Model Selection for Sparse Binary Time Series with Multiple Inputs. In Holan, S.H., Bell, W.R., and McElroy, T.S. (Eds.), Economic Times Series: Modeling and Seasonality. Boca Raton, FL: Chapman and Hall/CRC, 2012.

12. Hampson, R.E., Simeral, J.D., Berger, T.W., Song, D., Chan, H.M.R., and Deadwyler, S.A. Cognitively Relevant Recoding in Hippocampus: Beneficial Feedback of Ensemble Codes in a Closed-Loop Paradigm. In Vertes, R., and Stackman, R. (Eds.), Electrophysiological Recording Techniques. New York, NY: Springer, 2011, 215-240.

13. Song, D., and Berger, T.W. Identification of nonlinear dynamics in neural population activity. In Oweiss, K.G. (Ed.), Statistical Signal Processing for Neuroscience and Neurotechnology. Amsterdam: Elsevier, 2010, 103-128.

14. Stephens, M.L., Spencer, D.D., Cavus, I., Hsiao, M-C., Song, D., Deadwyler, S.A., Hampson, R.E., Putz, D., Quintero, J.E., Bensalem-Owen, M.K., Hascup, K.N., Rutherford. E.C., Day, B.K., Nickell, J.R., Pomerleau, F., Huettl, P., Burmeister, J.J., Talauliker, P.M., Marmarelis, V.Z., Granacki, J.J., Berger, T.W., and Gerhardt, G.A. Microelectrode-based epilepsy therapy: A hybrid neural prosthesis incorporating seizure prediction and intervention with biomimetic maintenance of normal hippocampal function. In Soltesz, I., and Staley, K. (Eds.), Computational Neuroscience in Epilepsy. Amsterdam: Elsevier, 2008, 559-586.

15. Berger, T.W., Ahuja, A., Courellis, S.H., Erinjippurath, G., Gholmieh, G., Granacki, J.J., Hsiao, M-C., LaCoss, J., Marmarelis, V.Z., Nasiatka, P., Srinivasan, V., Song, D., Tanguay, A.R., Jr., and Wills, J. Brain-implantable biomimetic electronics as neural prostheses to restore lost cognitive function. In Akay, M. (Ed.), Neuro-Nanotechnology: Artificial Implants and Neural Prostheses. NY: Wiley/IEEE Press, 2007, 309-336.

16. Berger, T.W., Ahuja, A., Courellis, S.H., Erinjippurath, G., Gholmieh, G., Granacki, J.J., Hsiao, M-C., LaCoss, J., Marmarelis, V.Z., Nasiatka, P., Srinivasan, V., Song, D., Tanguay, A.R., Jr., and Wills, J. Brain-implantable biomimetic electronics as neural prostheses to restore lost cognitive function. In Baudry, M., Schreiber, S., and Bi, X. (Eds.), Synaptic Plasticity: From Basic Mechanisms to Clinical Applications. New York, N.Y.: Taylor and Francis, 2006, 423-457.

17. Soussou, W., Gholmieh, G., Han, M., Ahuja, A., Song, D., Hsiao, M-C., Wang, Z., Tanguay, A.R., Jr., and Berger, T.W. Mapping spatio-temporal electrophysiological activity in hippocampal slices with conformal planar multielectrode arrays. In Taketani, M., and Baudry, M. (Eds.), Advances In Network Electrophysiology Using Multi-Electrode Arrays. New York, NY: Springer, 2006, 127-152.

Publications–Encyclopedia Article

1. Song, D., and Berger, T.W. Hippocampal memory prosthesis (edition 2). Encyclopedia of Computational Neuroscience. New York, NY: Springer, 2021, DOI: 10.1007/978-1-4614-7320-6_558-2.

2. Song, D. Memory decoding model. Encyclopedia of Computational Neuroscience. New York, NY: Springer, 2021, DOI: 10.1007/978-1-4614-7320-6_100677-1.

3. Song, D., and Berger, T.W. Hippocampal memory prosthesis. Encyclopedia of Computational Neuroscience. New York, NY: Springer, 2014, DOI: 10.1007/978-1-4614-7320-6_558-1.

Publications–Magazine Article

1. Song, D. Ersatzteile für Gehirnareale ("Memory Implant in Fiction and Reality"). Schweizer Monat ("Swiss Month. Author magazine for Politics, Economy and Culture"). Feb 2020, 1073.

Publications–Peer-Reviewed Conference Papers

1. Jiang, W., Isenhart, R., Kistler, N., Lu, Z., Xu, H., Lee, D., Liu, C.Y., and Song, D. Low intensity repetitive transcranial magnetic stimulation modulates spontaneous spiking activities in rat cortex. Proceedings of the IEEE EMBC Conference, 2021, accepted.
2. Meng, E., Scholten, K., and Song, D. Parylene implantable microelectrode neural interfaces. 10th International IEEE/EMBC Conference on Neural Engineering, 2021, Invited 1-page minisymposia paper.
3. She, X., Berger, T.W., and Song, D. Accelerating estimation of a multi-input, multi-output model of the hippocampus with a parallel computing strategy. Proceedings of the IEEE EMBC Conference, 2020, 2479-2482.
4. Moore, B., Berger, T.W., and Song, D. Validation of a convolutional neural network model for spike transformation using a generalized linear model. Proceedings of the IEEE EMBC Conference, 2020, 3236-3239.
5. Song, D., She, X., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Input-output modeling of the hippocampus for developing memory prostheses. Proceedings of the IEEE EMBC Conference, 2019, Invited 1-page paper.
6. Xu, H., Scholten, K., Meng, E., Berger, T.W., and Song, D. Application of Parylene-based flexible multi-electrode array for recording from subcortical brain regions from behaving rats. Proceedings of the IEEE EMBC Conference, 2018, 4599-4602.
7. Elyahoodayan, S., Berger, T.W., and Song, D. A closed-loop multi-channel asynchronous neurostimulator to mimic neural code for cognitive prosthesis. Proceedings of the IEEE EMBC Conference, 2018, 1388-1391.
8. Meng, E., Hirschberg, A.W., Xu, H., Scholten, K., Berger, T.W., and Song, D. Towards high density Parylene neural probe arrays for large scale recording. Proceedings of the IEEE EMBC Conference, 2018.
9. Yu, G., Bouteiller, J-M.C., Song, D., and Berger, T.W. Decoding position to analyze spatial information encoding in a large-scale neuronal network model of rat dentate gyrus. Proceedings of the IEEE EMBC Conference, 2018, 6137-6140.
10. Bingham, C., Bouteiller, J-M.C., Song, D., and Berger, T.W. Graph-based models of cortical axons for the prediction of neuronal response to extracellular electrical stimulation. Proceedings of the IEEE EMBC Conference, 2018, 1380-1383.
11. Hu, E, Yu, G., Song, D., Bouteiller, J-M.C., and Berger, T.W. Modeling nonlinear synaptic dynamics: a Laguerre-Volterra network framework for improved computational efficiency in large scale simulations. Proceedings of the IEEE EMBC Conference, 2018, 6129-6132.

12. Yu, P-N., Heck, C.N., Liu, C.Y., Song, D., and Berger, T.W. Using lasso and group lasso techniques for seizure prediction. Proceedings of the IEEE EMBC Conference, 2018.

13. Song, D., She, X., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Multi-resolution multi-trial sparse classification model for decoding visual memories from hippocampal spiking activities. Proceedings of the IEEE EMBC Conference, 2017, 1046-1049.

14. Xu, H., Weltman, A., Scholten, K., Meng, E., Berger, T.W., and Song, D. Chronic multi-region recording from the rat hippocampus *in vivo* with a flexible Parylene-based multi-electrode array. Proceedings of the IEEE EMBC Conference, 2017, 1716-1719.

15. Elyahoodayan, S., Berger, T.W., and Song, D. A multi-channel asynchronous neurostimulator to mimic neural code for cognitive prosthesis. Proceedings of the IEEE EMBC Conference, 2017.

16. Hirschberg, A., Xu, H., Scholten, K., Berger, T.W., Song, D., and Meng, E. Development of an anatomically conformal parylene neural probe array for multi-region hippocampal recordings. Micro Electro Mechanical Systems (MEMS), 2017 IEEE 30th International Conference on, 2017, DOI: 11.1109/MEMSYS.2017.7863357.

17. Song, D., Hampson, R.E., Robinson, B.S., Marmarelis, V.Z., Deadwyler, S.A., Berger, T.W. Decoding memory features from hippocampal spiking activities using sparse classification models. Proceedings of the IEEE EMBC Conference, 2016, 1620-1623.

18. Xu, H., Hsiao, M.C., Meng, E., Berger, T.W., and Song, D. A flexible parylene probe for *in vivo* recordings from multiple sub-regions of the rat hippocampus. Proceedings of the IEEE EMBC Conference, 2016, 2806-2809.

19. Robinson, B.S., Berger, T.W., and Song, D. Monte Carlo validation of spike-timing-dependent plasticity identification from spiking activity. Proceedings of the IEEE EMBC Conference, 2016, 1624-1627.

20. Hendrickson, P., Bingham, C., Song, D., and Berger, T.W. A bi-directional communication paradigm between parallel NEURON and an external non-NEURON process. Proceedings of the IEEE EMBC Conference, 2016, 1413-1416.

21. Hu, E., Bouteiller, J-M.C., Song, D., and Berger, T.W. The development of a detailed model of calcium dynamics at the postsynaptic spine of an excitatory synapse. Proceedings of the IEEE EMBC Conference, 2016, 6102-6105.

22. Bingham, C., Loizos, K., Yu, G., Gilbert, A., Bouteiller, J-M.C., Song, D., Gianluca, L., and Berger, T.W. A large-scale detailed neuronal model of electrical stimulation of the dentate gyrus and perforant path as a platform for electrode design and optimization. Proceedings of the IEEE EMBC Conference, 2016, 2794-2797.

23. Yu, G., Song, D., and Berger, T.W. Place field detection using grid-based clustering in a large-scale computational model of the rat dentate gyrus. Proceedings of the IEEE EMBC Conference, 2016, 1405-1408.

24. Yu, P-N., Naiini, S., Heck, C.N., Liu, C.Y., Song, D., and Berger, T.W. A sparse Laguerre-Volterra autoregressive model for seizure prediction in temporal lobe epilepsy. Proceedings of the IEEE EMBC Conference, 2016, 1664-1667.

25. Weltman, A., Xu, H., Scholten, K., Berger, T.W., Song, D., and Meng, E. Deep brain targeting strategy for bare parylene neural probe arrays. Hilton Head Conference, 2016.

26. Song, D., Robinson, B.S., Hampson, R.E., Marmarelis, V.Z., Deadwyler, S.A., Berger, T.W. Sparse generalized Volterra model of human hippocampal spike train transformation for memory prostheses. Proceedings of the IEEE EMBC Conference, 2015, 3961-3964.

27. Robinson, B.S., Song, D., and Berger, T.W. Estimation of a large-scale generalized Volterra model for neural ensembles with group lasso and local coordinate descent. Proceedings of the IEEE EMBC Conference, 2015, 2526-2529.

28. Xu, H., Hsiao, M.C., Meng, E., Berger, T.W., and Song, D. Design of a flexible parylene-based multi-electrode array for multi-region recording from the rat hippocampus. Proceedings of the IEEE EMBC Conference, 2015, 7139-7142.

29. Yu, G., Hendrickson, P., Song, D., and Berger, T.W. Topography-dependent spatio-temporal correlations in the entorhinal-dentate-CA3 circuit in a large-scale computational model of the rat hippocampus. Proceedings of the IEEE EMBC Conference, 2015, 3965-3968.

30. Hendrickson, P., Yu, G., Robinson, Song, D., and Berger, T.W. A million-plus neuron model of the hippocampal dentate gyrus: dependency of spatio-temporal network dynamics on topography. Proceedings of the IEEE EMBC Conference, 2015, 4713-4716.

31. Hu, E, Bouteiller, J-M.C., Song, D., and Berger, T.W. The Volterra functional series is a viable alternative to kinetic models for synaptic modeling - calibration and benchmarking. Proceedings of the IEEE EMBC Conference, 2015, 3291-3294.

32. Song, D., Hampson, R.E., Robinson, B.S., Opris, I., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical modeling of human hippocampal CA3-CA1 functional connectivity for memory prostheses. Proceedings of the IEEE EMBC Neural Engineering Conference, 2015, 316-319.

33. Li, W.X.Y., Xin, Y., Song, D., Berger, T.W., and Cheung, R.C.C. VLSI architecture of a high-performance neural spiking activity simulator based on generalized Volterra kernels. 2014 International Symposium on Integrated Circuits (ISIC), 2014, 272-275.

34. Song, D., Robinson, B.S., Granacki, J.J., and Berger, T.W. Implementing spiking neuron model and spike-timing-dependent plasticity with generalized Laguerre-Volterra models. Proceedings of the IEEE EMBC Conference, 2014, 714-717.

35. Robinson, B.S., Song, D., and Berger, T.W. Generalized Volterra kernel model identification of spike-timing-dependent plasticity from simulated spiking activity. Proceedings of the IEEE EMBC Conference, 2014, 6585-6588.

36. Xu, H., Hsiao, M.C., Song, D., and Berger, T.W. Recording place cells from multiple sub-regions of the rat hippocampus with a customized micro-electrode array. Proceedings of the IEEE EMBC Conference, 2014, 4876-4879.

37. Hu, E, Bouteiller, J-M.C., Huang, M., Song, D., and Berger, T.W. A comparison between direct and indirect measurements of neurotransmitter vesicle release dynamics: a computational study. Proceedings of the IEEE EMBC Conference, 2014, 1155-1158.

38. Hsiao, M.C., Yu, P-N., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. A testbed to explore the optimal electrical stimulation parameters for suppressing inter-ictal spikes in human hippocampal slices. Proceedings of the IEEE EMBC Conference, 2014, 5792-5795.

39. Yu, P-N., Hsiao, M.C., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. Unstable periodic orbits in human epileptic hippocampal slice. Proceedings of the IEEE EMBC Conference, 2014, 5800-5803.

40. Li, W.X.Y., Xin, Y., Chan, R.H.M., Song, D., Berger, T.W., and Cheung, R.C.C. Laguerre-Volterra model and architecture for MIMO system identification and output prediction. Proceedings of the IEEE EMBC Conference, 2014, 4539-4542.

41. Yu, G., Song, D., and Berger, T.W. Implementation of the excitatory entorhinal-dentate-CA3 topography in a large-scale computational model of the rat hippocampus. Proceedings of the IEEE EMBC Conference, 2014, 6581-6584.

42. Song, D., Robinson, B.S., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Identification of functional synaptic plasticity from ensemble spiking activities: a nonlinear dynamical modeling approach. Proceedings of the IEEE EMBC Neural Engineering Conference, 2013, 617-620.

43. Hampson, R.E., Fuqua, J., Huettl, P., Opris, I., Song, D., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G., and Deadwyler, S.A. Conformal multielectrode arrays (MEAs) for recording and stimulating in deep structures of nonhuman primates. Proceedings of the IEEE EMBC Neural Engineering Conference, 2013, Short Paper No. 0516.

44. Opris, I., Song, D., Shin, D., Gerhardt, G., Marmarelis, V.Z., Berger, T.W., Hampson, R.E., and Deadwyler, S.A. Hippocampal CA3-CA1 neural ensembles in nonhuman primates encode spatial and object features relevant for neural prosthetics. Proceedings of the IEEE EMBC Neural Engineering Conference, 2013, Short Paper No. 0517.

45. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Model-based design of optimal neurostimulation in the NHP hippocampus for enhancing behavioral task performance. Proceedings of the IEEE EMBC Neural Engineering Conference, 2013, 476-479.

46. Sandler, R., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. Closed-loop modeling of the hippocampus and design of neurostimulation patterns for suppressing seizures. Proceedings of the IEEE EMBC Neural Engineering Conference, 2013, 1143-1146.

47. Song, D., Wang, H., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Estimation of sparse dynamical model of neural functional connectivity using group Lasso and Laguerre basis functions. Transactions of Japanese Society for Medical and Biological Engineering, 2013, R-128.

48. Robinson, B.S., Song, D., and Berger, T.W. Laguerre-Volterra identification of spike-timing-dependent plasticity from spiking activity: a simulation study. Proceedings of the IEEE EMBC Conference, 2013, 5578-5581.

49. Ghaderi, V., Song, D., Bouteiller, J-M.C., Choma, J., and Berger, T.W. A programmable analog subthreshold biomimetic model for bi-directional communication with the brain. Proceedings of the IEEE EMBC Conference, 2013, 787-790.

50. Hampson, R.E., Fuqua, J., Huettl, P., Opris, I., Song, D., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G., and Deadwyler, S.A. Conformal ceramic electrodes that record glutamate release and corresponding neural activity in primate prefrontal cortex. Proceedings of the IEEE EMBC Conference, 2013, 5954-5957.

51. Yu, G., Hendrickson, P., Robinson, B.S., Song, D., and Berger, T.W. The role of topography in the transformation of spatiotemporal patterns by a large-scale, biologically realistic model of the rat dentate gyrus. Proceedings of the IEEE EMBC Conference, 2013, 5950-5953.

52. Hendrickson, P., Yu, G., Robinson, B.S., Song, D., and Berger, T.W. The contribution of relative activation levels between populations of cells to network activity in a large-scale biologically realistic model of the hippocampus. Proceedings of the IEEE EMBC Conference, 2013, 5962-5965.

53. Bouteiller, J-M.C., Hu, E., Allam, S., Ghaderi, V., Song, D., and Berger, T.W. Insights on synaptic paired-pulse response using parametric and non-parametric models. Proceedings of the IEEE EMBC Conference, 2013, 1041-1044.

54. Li, W.X.Y., Cheung, R.C.C., Chan, R.H.M., Song, D., and Berger, T.W. A reconfigurable architecture for real-time prediction of neural activity. IEEE International Symposium on Circuits and Systems, 2013, 1969-1872.

55. Song, D., Opris, I., Chan, R.H.M., Marmarelis, V.Z., Hampson, R., Deadwyler, S., and Berger, T.W. Functional connectivity between layer 2/3 and layer 5 neurons in prefrontal cortex of nonhuman primates during a delayed match-to-sample task. Proceedings of the IEEE EMBC Conference, 2012, 2555-2558.

56. Hsiao, M.C., Yu, P.N., Song, D., Liu, C.Y., Heck, C.N., Milet, D., and Berger, T.W. Spatio-temporal inter-ictal activity recorded from human epileptic hippocampal slices. Proceedings of the IEEE EMBC Conference, 2012, 5155-5169.

57. Li, W.X.Y., Chan, R.H.M., Song, D., Berger, T.W., and Cheung, R.C.C. A dual mode FPGA design for the hippocampal prosthesis. Proceedings of the IEEE EMBC Conference, 2012, 4579-4582.

58. Ghaderi, V., Roach, S., Song, D., Marmarelis, V.Z., Choma, J.Jr., and Berger, T.W. Analog low-power hardware implementation of a Laguerre-Volterra model of intracelular subthreshold neuronal activity. Proceedings of the IEEE EMBS Conference, 2012, 767-770.

59. Robinson, B.S., Yu, G., Hendrickson, P., Song, D., and Berger, T.W. Implementation of activity-dependent synaptic plasticity rules for a large-scale biologically realistic model of the hippocampus. Proceedings of the IEEE EMBC Conference, 2012, 1366-1369.

60. Roach, S., Lu, U., Song, D., and Berger, T.W. An Analysis of the expression locus of long-term potentiation in hippocampal CA1 neurons. Proceedings of the IEEE EMBC Conference, 2012, 5510-5513.

61. Yu, G., Robinson, B.S., Hendrickson, P., Song, D., and Berger, T.W. Implementation of topographically constrained connectivity for a large-scale biological realistic model of the Hippocampus. Proceedings of the IEEE EMBC Conference, 2012, 1358-1361.

62. Hendrickson, P., Yu, G., Robinson, B.S., Song, D., and Berger, T.W. Towards a large-scale biologically realistic model of the hippocampus. Proceedings of the IEEE EMBC Conference, 2012, 4595-4598.

63. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Estimation and statistical validation of event-invariant nonlinear dynamic models of hippocampal CA3-CA1 population activities. Proceedings of the IEEE EMBS Conference, 2011, 3330-3333.

64. Lu, U., Roach, S., Song, D., and Berger, T.W. A two-stage cascade nonlinear dynamic model of single neurons for the separation and quantification of pre- and post-synaptic mechanisms of synaptic transmission. Proceedings of the IEEE EMBS Conference, 2011, 1427-1430.

65. Chan, R.H.M., Song, D., Goonawardena, A., Bough, S., Sesay, J., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Tracking the changes of hippocampal population nonlinear dynamics in rats learning a memory-dependent task. Proceedings of the IEEE EMBS Conference, 2011, 3326-3329.

66. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Dynamic nonlinear modeling of interactions between neuronal ensembles using principal dynamic modes. Proceedings of the IEEE EMBS Conference, 2011, 3334-3337.

67. Hampson, R.E., Song, D., Chan, R.H.M., Sweatt, A., Shin, D., Marmarelis, V.Z., Gerhardt, G., Granacki, J., Berger, T.W., and Deadwyler, S.A.Restorative encoding memory integrative neural device: "REMIND". Proceedings of the IEEE EMBS Conference, 2011, 3338-3341.

68. Li, W.X.Y., Chan, R.H.M., Zhang, W., Cheung, R.C.C., Song, D., and Berger, T.W.A hardware-based computational platform for generalized Laguerre-Volterra MIMO model for neural activities. Proceedings of the IEEE EMBS Conference, 2011, 7282-7285.

69. Li, W.X.Y., Chan, R.H.M., Zhang, W., Yu, C., Cheung, R.C.C., Song, D., and Berger, T.W. FPGA architecture of generalized Laguerre-Volterra MIMO model for neural population spiking activities. Proceedings of the 21st International Conference on Field Programmable Logic and Applications (FPL11), 2011, 44-49.

70. Li, W.X.Y., Chan, R.H.M., Zhang, W., Cheung, R.C.C., Song, D., and Berger, T.W. FPGA architecture of generalized Laguerre-Volterra MIMO model for neural population spiking activities. Proceedings of the 19th IEEE Annual International Symposium on Field- Programmable Custom Computing Machines (FCCM11), 2011, 254-254.

71. Song, D., Wang, H., and Berger, T.W. Estimating sparse Volterra models using group *L*1-regularization. Proceedings of the IEEE EMBS Conference, 2010, 4128-4131.

72. Lu, U., Song, D., and Berger, T.W. Nonlinear dynamic analyses of single hippocampal neurons before and after long-term potentiation. Proceedings of the IEEE EMBS Conference, 2010, 2762-2765.

73. Chan, R.H.M., Song, D., Goonawardena, A.V., Bough, S., Sesay, J., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Changes of hippocampal CA3-CA1 population nonlinear dynamics across different training sessions in rats performing a memory-dependent task. Proceedings of the IEEE EMBS Conference, 2010, 5464-5467.

74. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Sparse generalized Laguerre-Volterra model of neural population dynamics. Proceedings of the IEEE EMBS Conference, 2009, 4555-4558.

75. Chan, R.H.M., Song, D., and Berger, T.W. Nonstationary modeling of neural population dynamics. Proceedings of the IEEE EMBS Conference, 2009, 4559-4562.

76. Hsiao, M., Song, D., and Berger, T.W. Using an open-loop inverse control strategy to regulate CA1 nonlinear dynamics for an in vitro hippocampal prosthesis model. Proceedings of the IEEE EMBS Conference, 2009, 1529-1532.

77. Lu, U., Song, D., and Berger, T.W. Nonlinear modeling of single hippocampal neurons with dynamic thresholds. Proceedings of the IEEE EMBS Conference, 2009, 3330-3334.

78. Song, D., Hendrickson, P., Marmarelis, V.Z., Aguayo, J., He, J., Loeb, G.E., and Berger, T.W. Predicting EMG with generalized Volterra kernel models. Proceedings of the IEEE EMBS Conference, 2008, 201-204.

79. Rosa H. M. Chan, Song, D., and Berger, T.W. Tracking Temporal Evolution of Nonlinear Dynamics in Hippocampus using Time-Varying Volterra Kernels. Proceedings of the 30th Annual International Conference of the IEEE EMBS, 2008, 4996-9.

80. Hsiao, M.-C., Song, D., and Berger, T.W. Control theory-based regulation of hippocampal CA1 nonlinear dynamics. Proceedings of the 30th Annual International IEEE EMBS Conference, 2008, 5535-5538.

81. Lu, U., Song, D., and Berger, T.W. Nonparametric modeling of single hippocampal neurons. Proceedings of the IEEE EMBS Conference, 2008, 2469-2472.

82. Song, D., Chan, R. H. M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Statistical selection of multiple-input multiple-output nonlinear dynamic models of spike train transformation. Proceedings of the IEEE EMBS Conference, 2007, 4727-4730.

83. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Physiologically plausible stochastic nonlinear kernel models of spike train to spike train transformation. Proceedings of the IEEE EMBS Conference, 2006, 6129-6132.

84. Xiaping, X., Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Interaction of short-term neuronal plasticity and synaptic plasticity revealed by nonlinear systems analysis in dentate granule cells. Proceedings of the IEEE EMBS Conference, 2006, 5543-5546.

85. Hsiao, M-C., Chan, C-H., Srinivasan, V., Ahuja, A., Erinjippurath, G., Zanos, T.P., Gholmieh, G., Song, D., Wills, J.D., LaCoss, J., Courellis, S., Tanguay, Jr., A.R., Granacki, J.J., Marmarelis, V.Z., and Berger, T.W. VLSI implementation of a nonlinear neuronal model: A “neural prosthesis” to restore hippocampal trisynaptic dynamics. Proceedings of the IEEE EMBS Conference, 2006, 4396-4399.

86. Berger, T.W., Gholmieh, G., Hsiao, M-C., Song, D., Granacki, J.J., Wills, J., LaCoss, J., Srinivasan, V., Marmarelis, V.Z., Courellis, S.H., Erinjippurath, G., Tanguay, A.R., Ahuja, A., Nasiatka, P., Deadwyler, S.A., Hampson, R.E., and Gerhardt, G.A. Implantable biomimetic electronics as neural prostheses for lost cognitive function. Proceedings of the 6th Asian-Pacific Conference on Medical and Biological Engineering, Tsukuba, Japan, 2005.

87. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. A Modeling paradigm incorporating parametric and non-parametric methods. Proceedings of the 26th Annual International Conference of the IEEE EMBS, 2004, 647-650.

88. Dibazar, A.A., Song, D., Yamada, W., and Berger, T.W. Speech recognition based on fundamental principles of the brain. Proceedings of the IEEE International Joint Conference on Neural Networks, Budapest, Hungary, 2004.

89. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Non-parametric interpretation and validation of parametric models of short-term plasticity. Proceedings of the IEEE EMBS Conference, 2003, 1901-1904.

90. Wang, Z., Xie, X., Song, D., and Berger, T.W. Probabilistic transformation of temporal information at individual synapses. Proceedings of the IEEE EMBS Conference, 2003, 1909-1912.

91. Gholmieh, G., Courellis, S.H., Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Characterization of short-term plasticity of the dentate gyrus-CA3 system using nonlinear systems analysis. Proceedings of the IEEE EMBS Conference, 2003, 1929-1932.

92. Dimoka, A., Courellis, S.H., Song, D., Marmarelis, V.Z., and Berger, T.W. Identification of lateral and medial perforant path using single- and dual-input random impulse train stimulation. Proceedings of the IEEE EMBS Conference, 2003, 1933-1936.

93. Song, D., Marmarelis, V.Z., and Berger, T.W. Parametric and non-parametric models of short-term plasticity. Proceedings of the Second Joint EMBS/BMES Conference, 2002, 1964-1965.

94. Wang, Z., Song, D., and Berger, T.W. Experimental and modeling studies of the contribution of NMDA receptor-channels to the expression of long-term potentiation. Proceedings of the Second Joint EMBS/BMES Conference, 2002, 1962-1963.

Selected Conference Abstracts and Presentations

1. Flynn, G., Gotsis, M., and Song, D. "'Browser-based brain-computer interfaces: What comes after true web access? Annual Meeting of the International Neuroethics Society, November 4-5, 2021.

2. Scholten, K., Ortigoza-Diaz, J., Xu, H., Song, D., and Meng, E. A 64-channel Parylene C neural probe array for (sub)/cortical recording in free-moving rodents. North American Neuromodulation / Neural Interfaces Conference (NANS-NIC), 2021.

3. Yoo, J., Samiei, A., Jiang, W., Song, D., Hashemi, H., and Meng, E. Polymer ultrasonic bump (PUB) bonding integrated circuits to high-density polymer neural interfaces. North American Neuromodulation / Neural Interfaces Conference (NANS-NIC), 2021.

4. She, X., Moore, B., Roeder, B., Nune, G., Lee, B., Shaw, S., Nguyen, A., Heck, C., Liu, C., Deadwyler, S., Hampson, R., Berger, T., and Song, D. An ensemble classifier for decoding hippocampal spike patterns during a delayed match-to-sample task in humans. Society for Neuroscience Global Connectome Abstract, 2021, P320.01.

5. Moore, B., and Song, D. Modeling of neural spike pattern transformation as classification of binary images with a convolutional neural network. Society for Neuroscience Global Connectome Abstract, 2021, P388.19.

6. Jiang, W., Wang, X., Xu, H., Meng, E., and Song, D. Large-scale recordings from the rat hippocampus using a 3D Parylene-based multi-electrode array. Society for Neuroscience Global Connectome Abstracts, 2021, P381.04.

7. Scholten, K., Ortigoza-Diaz, J., Song, D., and Meng, E. Advances in polymer microelectrode array technology. Society for Neuroscience Global Connectome Abstract, 2021, P381.07.

8. Moore, B.J., and Song, D. Validation of a Convolutional Neural Network Model for Spike Transformation Using a Generalized Functional Additive Model. Neuromatch 3.0, 2020.

9. She, X., Berger, T.W., and Song, D. A Double-Layer Multi-Resolution Classification Model for Decoding Spatio-Temporal Patterns of Spikes. Neuromatch 3.0, 2020.

10. Yu, P-N., Berger, T.W., and Song, D. A Sparse Multiscale Nonlinear Autoregressive Model for Seizure Prediction. Neuromatch 3.0, 2020.
11. Flynn, G., Zhang, M., Rao, K., Klein, E., and Song, D. A systematic review of stakeholder perspectives on cognitive effects of brain stimulation. Neuromatch 3.0, 2020.
12. Jiang, W., Wang, X., Xu, H., Meng, E., and Song, D. A 3D Parylene-based multi-electrode array for large scale recordings from the rat hippocampus. Neuromatch 3.0, 2020.
13. Xu, H., Hirschberg, A., Jiang, W., Scholten, K., Wang, X., Meng, E., and Song, D. Chronic Recording from Multiple Hippocampal Sub-Regions in Free Moving Rats with a Flexible Parylene-Based Multi-Electrodes Array. Neuromatch 3.0, 2020.
14. Flynn, G., Rao, K., Zhang, M., Klein, E., and Song, D. A systematic review of stakeholder perspectives on cognitive effects of brain stimulation. Annual Meeting of the International Neuroethics Society, October 22-23, 2020.
15. Flynn, G., Goldstuck, J., Kuligowski, M., Diaz, D., Zacharia, K., Gotsis, M., and Song, D. "Livewire—A Stimulating Night of Neurotechnology" immersive brain-computer interface experience: Combining neuroscience, art and ethics for participatory technology assessment. Annual Meeting of the International Neuroethics Society, October 22-23, 2020.
16. Jiang, W., Wang, X., Xu, H., Scholten, K., Meng, E., and Song, D. Developing a 3D Parylene-based multi-electrode array for large-scale recordings from the rat hippocampus. Sixth Annual BRAIN Initiative Investigator Meeting, June 1-2, 2020.
17. Elyahoodayan, S., Jiang, W., Lee, C., Shao, A., Whalen, J., Petrossians, A., and Song, D. Bidirectional stimulation and recording with Pt-Ir coated microelectrodes in the hippocampus. Sixth Annual BRAIN Initiative Investigator Meeting, June 1-2, 2020.
18. Scholten, K., Ortigoza-Diaz, J., Xu, H., Song, D., and Meng, E. A shared technology resource for polymer microelectrode arrays. Sixth Annual BRAIN Initiative Investigator Meeting, June 1-2, 2020.
19. Scholten, K., Larson, C., Xu, H., Song, D., and Meng, E. A 512-channel multi-layer polymer-based neural probe array. Hilton Head MEMS, 2020.
20. Flynn, G., and Song, D. A multi-stakeholder review of neural prosthesis ethics. Annual Meeting of the International Neuroethics Society, October 17-18, 2019
21. Jiang, W., Xu, H., Wang, X., Meng, E., and Song, D. Developing a 3D Parylene-based multi-electrode array for large-scale recordings from the rat brain. Society for Neuroscience Abstracts, 2019, 430.07.
22. Elyahoodayan, S., Jiang, W., and Song, D. A multi-channel asynchronous neurostimulator with artifact suppression for neural code-based stimulations. Society for Neuroscience Abstracts, 2019, 797.05
23. Song, D., She, X., Moore, B., Roeder, B.M., Nune, G., Lee, B., Heck, C.N., Liu, C.Y., Deadwyler, S.A., Hampson, R.E., and Berger, T.W. Decoding memory–towards building patient common memory decoding model using a transfer learning approach. Society for Neuroscience Abstracts, 2019, 698.06.
24. She, X., Song, D., Moore, B., Roeder, B.M., Lee, B., Shaw, S.J., Nguyen, A., Heck, C.N., Liu, C.Y., Deadwyler, S.A., Hampson, R.E., and Berger, T.W. Decoding memory–Patient specific models for decoding memory categories from hippocampal spiking activities in epilepsy patients. Society for Neuroscience Abstracts, 2019, 698.03.
25. Hampson, R.E., Roeder, B.M., Dakos, A.S., She, X., Moore, B., Song, D., Berger, T.W., and Deadwyler, S.A. Decoding memory–Memory facilitation of category information for up to 75 minutes using hippocampal stimulation via a memory decoding model. Society for Neuroscience Abstracts, 2019, 698.04.

26. Deadwyler, S.A., Roeder, B.M., Dakos, A.S., She, X., Moore, B., Song, D., Berger, T.W., and Hampson, R.E. Decoding memory– "Write-in" of category information on ambiguous trials via human hippocampal memory decoding model. Society for Neuroscience Abstracts, 2019, 698.05.

27. Roeder, B.M., Dakos, A.S., She, X., Moore, B., Song, D., Berger, T.W., Deadwyler, S.A., and Hampson, R.E. Decoding memory–24 hour memory facilitation of category information via a memory decoding model of hippocampus. Society for Neuroscience Abstracts, 2019, 698.07.

28. Pham, D-T.J., Bouteiller, J-M.C., Yu, G., Song, D., and Berger, T.W. From artificial to biological neural networks: How machine learning facilitates simulation of nonlinear synaptic dynamics in large-scale models. Society for Neuroscience Abstracts, 2019, 431.10.

29. Bingham, C.S., Girard, C., Paknahad, J., Song, D., Bouteiller, J-M.C., Lazzi, G., and Berger, T.W. A numerical approach to calculating LFPs in multi-scale neural network models. Society for Neuroscience Abstracts, 2019, 431.11.

30. Yu, G., Bouteiller, J-M.C., Song, D., and Berger, T.W. A large-scale neuronal network model of the trisynaptic pathway of rat hippocampus. Society for Neuroscience Abstracts, 2019, 431.14.

31. Elyahoodayan, S., and Song, D. Design and testing of a multi-channel asynchronous neurostimulator with stimulation artifact rejection for cortical prosthesis. Society for Neuroscience Abstracts, 2018, 174.15.

32. Xu, H., Jiang, W., Hirschberg, A., Scholten, K., Meng, E., and Song, D. Long-term evaluation of a parylene-based multi-electrode array for recordings from the hippocampus of behaving rats. Society for Neuroscience Abstracts, 2018, 431.10.

33. Song, D., She, X., Hampson, R.E., Nune, G., Lee, B., Heck, C.N., Liu, C.Y., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Facilitating memory: Enhancing human memory function with endogenous hippocampal neural code predicted by a closed-loop nonlinear dynamical model. Society for Neuroscience Abstracts, 2018, 335.29.

34. She, X., Song, D., Hampson, R.E., Nune, G., Lee, B., Heck, C.N., Liu, C.Y., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Facilitating memory: An ensemble sparse classification model for decoding memory categories and features from hippocampal spike patterns recorded in epilepsy patients. Society for Neuroscience Abstracts, 2018, 335.28.

35. Roeder, B.M., Johnson, C.A., Dakos, A.S., She, X., Song, D., Berger, T.W., Deadwyler, S.A., and Hampson, R.E. Facilitating memory: Shared codes for prosthetic stimulation of memory categories. Society for Neuroscience Abstracts, 2018, 335.27.

36. Hampson, R.E., Roeder, B.M., Johnson, C.A., Dakos, A.S., She, X., Song, D., Berger, T.W., and Deadwyler, S.A. Facilitating memory: Individualized prosthetic stimulation for memory categories. Society for Neuroscience Abstracts, 2018, 335.26.

37. Bingham, C.S., Paknahad, J., Bouteiller, J-M.C., Song, D., Lazzi, G., and Berger, T.W. Admittance method for estimating local field potentials generated in a multi-scale model of the hippocampus. Society for Neuroscience Abstracts, 2018, 523.13.

38. Yu, G., Song, D., Bouteiller, J-M.C., and Berger, T.W. A generalized linear model to capture the nonlinear dynamics of neural ensembles within a large-scale neuronal network model of hippocampus. Society for Neuroscience Abstracts, 2018, 525.15.

39. Hu, E., Bouteiller, J-M.C., Yu, G., Song, D., Marmarelis, V.Z., and Berger, T.W. Multi-scale modeling of complex nonlinear synaptic dynamics using sparse Laguerre-Volterra network. Society for Neuroscience Abstracts, 2018, 525.16.

40. Larson, C., Elyahoodayan, S., Cobo, A., Scholten, K., Song, D., and Meng, E. Reliability and acute *in vivo* testing of the lyse-and-attract cuff electrode. Society for Neuroscience Abstracts, 2018, 700.15.

41. Elyahoodayan, S., Larson, C., Meng, E., and Song, D. Acute electrophysiological and drug delivery tests of Parylene cuff electrode with embedded microfluidic channels. Neural Interfaces Conference, Minneapolis, USA, 2018.

42. Larson, C., Elyahoodayan, S., Cobo, A., Scholten, K., Song, D., and Meng, E. Reliability and acute *in vivo* testing of the Lyse-and-Attract Cuff Electrode. Neural Interfaces Conference, Minneapolis, USA, 2018.

43. Scholten, K., Hirschberg, A., Xu, H., Song, D., and Meng, E. Fabrication and testing of a polymer-based microelectrode array for hippocampal recordings. Neural Interfaces Conference, Minneapolis, USA, 2018.

44. Song, D., Hampson, R.E., Robinson, B.S., She, X., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Fixing broken memory: Reinstating memory codes with multi-input, multi-output models of the hippocampus in human. Society for Neuroscience Abstracts, 2017, 168.17.

45. She, X., Song, D., Hampson, R.E., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Fixing broken memory: Decoding memories from human hippocampal spiking activities. Society for Neuroscience Abstracts, 2017, 168.16.

46. Hampson, R.E., Roeder, B.M., Dakos, A.S., Wicks, R.T., Witcher, M.R., Couture, D.E., Laxton, A.W., Munger-Clary, H., Popli, G., Sollman, M.J., Song, D., Robinson, B.S., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Fixing broken memory: Facilitation of delayed recognition short-term memory in human subjects via a neural prosthetic for human memory. Society for Neuroscience Abstracts, 2017, 168.14.

47. Deadwyler, S.A., Roeder, B.M., Dakos, A.S., Wicks, R.T., Witcher, M.R., Couture, D.E., Laxton, A.W., Munger-Clary, H., Popli, G., Sollman, M.J., Song, D., Robinson, B.S., Marmarelis, V.Z., Berger, T.W., and Hampson, R.E. Fixing broken memory: Facilitation of delayed match to sample working memory in human subjects via a neural prosthetic for human memory. Society for Neuroscience Abstracts, 2017, 168.18.

48. Xu, H., Hirschberg, A., Scholten, K., Meng, E., Berger, T.W., and Song, D. Multi-region recordings from the hippocampus of free-moving rats with a Parylene-based multi-electrode array. Society for Neuroscience Abstracts, 2017, 343.07.

49. Yu, G., Song, D., and Berger, T.W. Cellular and network contributions to place field formation and place encoding in the entorhinal-dentate system: A large-scale, computational, spiking neural network study. Society for Neuroscience Abstracts, 2017, 92.14.

50. Hu, E.Y., Bouteiller, J-M.C., Mergenthal, A., Song, D., and Berger, T.W. Mechanistic and input-output models of calcium dynamics at the postsynaptic spine to enable cross-scale investigations of their effects. Society for Neuroscience Abstracts, 2017, 92.16.

51. Yu, P-N., Heck, C.N., Liu, C.Y., Song, D., and Berger, T.W. Resampling technique effects for lasso in seizure prediction. Society for Neuroscience Abstracts, 2017, 665.12.

52. Bingham, C.S., Loizos, K., Yu, G.J., Bouteiller, J-M.C., Song, D., Lazzi, G., and Berger, T.W. Anatomic determinants of spatiotemporal patterns of activity in a NEURON-Admittance Method study of hippocampal prostheses. Society for Neuroscience Abstracts, 2017, 719.1.

53. Combs, M., Weltman, A., Xu, H., Scholten, K., Song, D., and Meng, E. Immunohistological image analysis of microprobe array targeting hippocampus. Biomedical Engineering Society Annual Meeting, 2017, P-SAT-456.

54. Song, D., Hampson, R.E., Robinson, B.S., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Decoding memory features from hippocampal CA3 and CA1 spike trains during a delayed match-to-sample task in human. Society for Neuroscience Abstracts, 2016, 637.22.

55. Xu, H., Weltman, A., Hsiao, M-C., Meng, E., Berger, T.W., and Song, D. The application of a parylene neural probe for *in vivo* recordings from multiple sub-regions of the rat hippocampus. Society for Neuroscience Abstracts, 2016, 838.04.

56. Yu, G., Song, D., and Berger, T.W. Consequences of sparse activity in the ento-dentate-CA3 pathway: investigations using a large-scale, biologically realistic, computational model of the hippocampus. Society for Neuroscience Abstracts, 2016, 368.01.

57. Bingham, C.S., Bouteiller, J-M.C., Song, D., and Berger, T.W. A model of axonal branching for medium and long range fibers in a multi-scale model of hippocampal tissue. Society for Neuroscience Abstracts, 2016, 368.03.

58. Hu, E.Y., Mergenthal, A., Bouteiller, J-M.C., Song, D., and Berger, T.W. A detailed computational model of mechanisms underlying calcium regulation and dysregulation in glutamatergic postsynaptic spines. Society for Neuroscience Abstracts, 2016, 368.04.

59. Hendrickson, P., Loizos, K., Gilbert, A., Song, D., Lazzi, G., and Berger, T.W. A closed-loop multi-scale simulation paradigm for accurate modeling of electrical stimulation in hippocampus. Society for Neuroscience Abstracts, 2016, 368.05.

60. Robinson, B.S., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Identification of a functional spike-timing-dependent plasticity rule from ensemble hippocampal spiking activity with generalized multilinear modeling. Society for Neuroscience Abstracts, 2016, 401.08.

61. Yu, P-N., Heck, C.N., Liu, C.Y., Song, D., and Berger, T.W. A sparse autoregressive model as feature extraction for seizure prediction in temporal lobe epilepsy. Society for Neuroscience Abstracts, 2016, 691.10.

62. Wicks, R., Witcher, M., Couture, D., Laxton, A., Popli, G., Sollman, M., Song, D., Marmarelis, V.Z., Berger, T.W., Deadwyler, S.A., and Hampson, R.E. Human hippocampal recording and stimulation: validation of depth electrode placement through combined high-resolution imaging and electrophysiologic recordings. Society for Neuroscience Abstracts, 2016, 744.09.

63. Robinson, B.S., Berger, T.W., and Song, D. Identification of a stable STDP rule from spike timing with generalized multilinear modeling. COSYNE, 2016.

64. Song, D., Hampson, R.E., Robinson, B.S., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical model of human hippocampal CA3-CA1 spike transformation as the computational basis of memory prostheses. Society for Neuroscience Abstracts, 2015, 171.15.

65. Robinson, B.S., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical identification of a functional spike-timing-dependent plasticity rule from ensemble hippocampal spiking activities in rats learning a delayed nonmatch-to-sample task. Society for Neuroscience Abstracts, 2015, 171.16.

66. Hampson, R.E., Song, D., Robinson, B.S., Witcher, M.R., Couture, D.E., Laxton, A.M., Popli, G., Sollman, M.J., Petterhoff, D., Sexton, C.A., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Restoring active memory via CA3/CA1 recording and MIMO model-derived CA1 stimulation in human hippocampus. Society for Neuroscience Abstracts, 2015, 171.17.

67. Hendrickson, P., Yu, G., Song, D., and Berger, T.W. Critical role of topography in determining spatio-temporal network dynamics in a large-scale model of hippocampus. Society for Neuroscience Abstracts, 2015, 93.07.

68. Yu, G., Hendrickson, P., Song, D., and Berger, T.W. Emergent anatomical and functional organization of place bias cells in the dentate in a large-scale biologically realistic model of the rat hippocampus. Society for Neuroscience Abstracts, 2015, 93.19.

69. Hu, E.Y., Bouteiller, J-M.C., Song, D., Baudry, M., and Berger, T.W. Nonlinear modeling of calcium dynamics in glutamatergic postsynaptic spine for large scale simulations. Society for Neuroscience Abstracts, 2015, 93.20.

70. Bouteiller, J-M.C., Hu, E.Y., Somogyi, E.T., Guo, Y., Rousso, D., Zhang, Y., Chen, C., Venkatesh, J., Song, D., and Berger, T.W. MEMORY, A SBML based Multiscale simulation platform integrating both parametric and non-parametric modeling methodologies. Society for Neuroscience Abstracts, 2015, 451.25.

71. Hsiao, M-C., Yu, P-N., Song, D., Liu, C.Y., Heck, C.N., and Berger, T.W. Evaluating the seizure suppression effect induced by electrical stimulation: an *In vitro* study using human hippocampal tissue. Society for Neuroscience Abstracts, 2015, 498.02.

72. Sandler, R., Fetterhoff, D., Berger, T.W., Song, D., Hampson R.E., and Marmarelis, V.Z. Functional cannabinoid-induced isolation of CA1 from CA3 in rodent hippocampus. Society for Neuroscience Abstracts, 2015, 576.01.

73. Xu, H., Hsiao, M-C., Song, D., and Berger, T.W. The design and application of a flexible parylene-based multi-electrode array for *in vivo* recording from the rat hippocampus. Society for Neuroscience Abstracts, 2015, 625.05.

74. Cline, J.W., Loizos, K., Bingham, C.S., Yu, G.J., Hendrickson, P.J., Bouteiller, J-M.C., Song, D., Berger, T.W., and Lazzi, G. Estimation of local field potentials in a three-dimensional, computational model of the hippocampal dentate gyrus: a multiscale, multimodal framework, IMAG Multiscale Modeling Consortium Meeting, 2015.

75. Hsiao, M-C., Yu, P-N., Song, D., Berger, T.W., Millett, D., Heck, C.N., and Liu, C.Y. Characteristics of epileptiform activity recorded using MEA from human hippocampal slices in an in-vitro model for neurostimulation and epilepsy. 69th Annual meeting of American Epilepsy Society, 2015, 2327645.

76. Song, D., Harway, M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Hippocampal memory prosthesis: decoding and restoring hippocampal spatial memories with nonlinear dynamical modeling. Society for Neuroscience Abstracts, 2014, 264.18.

77. Sandler, R., Song, D., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. In-vivo predictive relationship from CA1 to CA3 in rodent hippocampus. Society for Neuroscience Abstracts, 2014, 264.03.

78. Robinson, B.S., Song, D., and Berger, T.W. Hippocampal memory prosthesis: enhancing nonlinear dynamical identification of spike-timing-dependent plasticity. Society for Neuroscience Abstracts, 2014, 264.17.

79. Hsiao, M-C., Yu, P-N., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. Electrical stimulation suppresses inter-ictal activity in human hippocampal slices. Society for Neuroscience Abstracts, 2014, 314.04.

80. Yu, G.J., Hendrickson, P., Bouteiller, J-M.C., Song, D., and Berger, T.W. Topography-dependent EC-DG-CA3 dynamics in a large-scale biologically realistic model of the rat hippocampus. Society for Neuroscience Abstracts, 2014, 372.15.

81. Hu, E.Y., Huang, M., Bouteiller, J-M.C., Song, D., Bischoff, S., Baudry, M., and Berger, T.W. An input-output model of the glutamatergic synapse for improved computational efficiency in multi-scale modeling. Society for Neuroscience Abstracts, 2014, 372.16.

82. Xu, H., Hsiao, M-C., Song, D., and Berger, T.W. Neural response in multiple hippocampal sub-regions to the manipulation of spatial cues in rats. Society for Neuroscience Abstracts, 2014, 463.21.

83. Yu, P-N., Hsiao, M-C., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. Unstable periodic orbits of interictal bursts in hippocampal slices from patients with epilepsy. Society for Neuroscience Abstracts, 2014, 485.13.

84. Opris, I., Fetterhoff, D., Sexton, C.A., Santos, L.M., Long, J.L., Noto, J.V., Parish, B.C., Jurchescu, O.D., Enachescu, M., Gerhardt, G.A., Song, D., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Integration of executive control signals across prefrontal cortical-striatal and hippocampal neural ensembles. Society for Neuroscience Abstracts, 2014, 844.16.

85. Berger, T.W., Yu, G., Hendrickson, P., Bouteiller, J-M.C., Song, D., Loizos, K., and Lazzi, G. Optimizing multi-electrode array design, placement, and stimulation patterns using a multiscale multimodal modeling framework. IMAG Multiscale Modeling Consortium Meeting, 2014.

86. Berger, T.W., Hu, E., Yu, G., Hendrickson, P., Bouteiller, J-M.C., and Song, D. Bridging biomolecular mechanisms to multicellular networks in a multiscale model of the hippcampus using input-output modeling. IMAG Multiscale Modeling Consortium Meeting, 2014.

87. Song, D., Hampson R.E., Opris, I., Marmarelis, V.Z., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical modeling of human hippocampus for memory prostheses. IEEE EMBS BRAIN Grand Challenge Conference Abstract, 2014, GC207.

88. Opris, I., Fetterhoff, D., Sexton, C.A., Song, D., Gerhardt, G.A., Marmarelis, V.Z., Hampson R.E., Berger, T.W. and Deadwyler, S.A. Integration of executive control signals between prefrontal cortical-striatal and hippocampal CA1-CA3 neural ensembles. IEEE EMBS BRAIN Grand Challenge Conference Abstract, 2014, GC105.

89. Sandler, R., Fetterhoff, D., Song, D., Hampson R.E., Berger, T.W., and Marmarelis, V.Z. Functional dynamical changes induced by cannabinoids in rodent hippocampus. IEEE EMBS BRAIN Grand Challenge Conference Abstract, 2014, GC130.

90. Robinson, B.S., Song, D., and Berger, T.W. Nonlinear identification of functional spike-timing-dependent plasticity from simulated spiking activity. BMES Annual Meeting, 2014, San Antonio, Texas.

91. Song, D., Robinson, B.S., Chan, R.H.M., Opris, I., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. REMIND: A non-stationary nonlinear dynamical modeling approach to the identification of functional synaptic plasticity in behaving animals. Society for Neuroscience Abstracts, 2013, 834.10.

92. Robinson, B.S., Song, D., and Berger, T.W. REMIND: Volterra estimation of a spike-timing-dependent plasticity learning rule from spiking data. Society for Neuroscience Abstracts, 2013, 834.09.

93. Hu, E.Y., Bouteiller, J-M.C., Allam, S.L., Ambert, N., Bischoff, S., Song, D., Baudry, M., and Berger, T.W. Analysis of drug-induced changes in synaptic and neuronal responses with parametric and nonparametric modeling. Society for Neuroscience Abstracts, 2013, 103.01.

94. Hendrickson, P., Yu, G., Robinson, B.S., Song, D., and Berger, T.W. Feed-forward and feedback inhibition in the hippocampal network: a large-scale modeling study. Society for Neuroscience Abstracts, 2013, 103.02.

95. Yu, G.J., Hendrickson, P., Robinson, B.S., Song, D., and Berger, T.W. Effects of topography on spatio-temporal network activity in the entorhinal-dentate-CA3 hippocampal circuit: a large-scale modeling study. Society for Neuroscience Abstracts, 2013, 103.09.

96. Yu, P-N., Hsiao, M-C., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. Phase resetting analysis of interictal bursts in hippocampal slices from patients with epilepsy. Society for Neuroscience Abstracts, 2013, 336.22.

97. Hsiao, M-C., Yu, P-N., Song, D., Liu, C.Y., Heck, C.N., Millett, D., and Berger, T.W. REMIND: Toward a REMIND prosthesis for the human hippocampus. Society for Neuroscience Abstracts, 2013, 834.01.

98. Hampson, R.E., Fuqua, J.L., Huettl, P.F., Opris, I., Santos, L.M., Song, D., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G.A., and Deadwyler, S.A. REMIND: Glutamate release in prefrontal cortex correlates with differential encoding of behavioral task in nonhuman primates. Society for Neuroscience Abstracts, 2013, 834.02.

99. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. REMIND: Parsing the neural code in the primate hippocampus via dynamic nonlinear modeling. Society for Neuroscience Abstracts, 2013, 834.04.

100. Sandler, R., Shin, D., Song, D., Opris, I., Hampson, R.E., Deadwyler, S.A., Berger, T.W., and Marmarelis, V.Z. REMIND: Closed-loop modeling of the hippocampus predicts theta-band resonances. Society for Neuroscience Abstracts, 2013, 834.06.

101. Opris, I., Santos, L.M., Song, D., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G.A., Hampson, R.E., and Deadwyler, S.A. REMIND: Hippocampal neural ensembles in nonhuman primates encode task-related features relevant to implementation of a neural prosthetic. Society for Neuroscience Abstracts, 2013, 834.08.

102. Xu, H., Hsiao, M-C., Song, D., and Berger, T.W. REMIND: Simultaneous place cells recording from dentate gyrus, CA3 and CA1 regions in rat with a triple-region electrode array. Society for Neuroscience Abstracts, 2013, 834.11.

103. Song, D., Wang, H., Marmarelis, V.Z., and Berger, T.W. Identification of neural functional connectivity using sparse generalized Volterra models. Society for Neuroscience Abstracts, 2012, 413.13.

104. Song, D., Opris, I., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical modeling of the functional connectivity in prefrontal cortex of nonhuman primates during a delayed match-to-sample task. Society for Neuroscience Abstracts, 2012, 480.03.

105. Hampson, R.E., Long, J.L., Noto, J.V., Parrish, B.C., Song, D., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G.A., and Deadwyler, S.A. Patterned stimulation of prefrontal cortex alters executive decision making by nonhuman primates performing a delayed match to sample task. Society for Neuroscience Abstracts, 2012, 480.02.

106. Xu, H., Hsiao, M-C., Song, D., and Berger, T.W. Simultaneous recording of unitary activities from dentate gyrus, CA3 and CA1 regions of the hippocampus in behaving rats with a customized multi-electrode array. Society for Neuroscience Abstracts, 2012, 504.08.

107. Yu, P-N., Hsiao, M-C., Song, D., Liu, C. Y., Heck, C. N., Millett, D., and Berger, T. W. A digital signal processor platform for testing the efficiency of electrical stimulation on suppressing epileptiform activity in hippocampal slices from epileptic patients. Society for Neuroscience Abstracts, 2012, 657.09.

108. Hsiao, M-C., Yu, P-N., Song, D., Liu, C. Y., Heck, C. N., Millett, D., and Berger, T. W. 4-aminopyridine induced inter-ictal epileptiform recorded from human epileptic hippocampal slices using multielectrode array systems. Society for Neuroscience Abstracts, 2012, 657.10.

109. Roach, S., Lu, U., Song, D., and Berger, T. W. Higher-order effects of long-term potentiation in hippocampal CA1 neurons. Society for Neuroscience Abstracts, 2012, 712.30.

110. Yu, G.J., Robinson, B.S., Hendrickson, P., Song, D., and Berger, T.W. Significance of topographically constrained connectivity for a large-scale model of the hippocampus. Society for Neuroscience Abstracts, 2012, 397.14.

111. Hendrickson, P., Yu, G.J., Robinson, B.S., Song, D., and Berger, T.W. Creation of a large-scale, biologically realistic model of the hippocampus. Society for Neuroscience Abstracts, 2012, 397.15.

112. Robinson, B.S., Yu, G. J., Hendrickson, P., Song, D., and Berger, T. W. Incorporation of synaptic plasticity rules in a large-scale model of the hippocampus. Society for Neuroscience Abstracts, 2012, 397.16.

113. Marmarelis, V.Z., Shin, D., Song, D., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Optimal Multi-Unit Stimulation Pattern Design for Cognitive Neuroprosthesis based on Dynamic Nonlinear Modeling. The 34th Annual International Conference of the IEEE EMBS, Symposium Abstract, 2012.

114. Hampson, R.E., Opris, I., Song, D., Gerhardt, G.A., Shin, D., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Neural Representation of Cognitive Processing in the Prefrontal Cortex of Nonhuman Primates. The 34th Annual International Conference of the IEEE EMBS, Symposium Abstract, 2012.

115. Song, D., Wang, H., and Berger, T.W. Generalized Volterra model and its applications on neurobiological signal processing. 2012 Joint Statistical Meetings, 2012, 566 (305722).

116. Song, D., Opris, I., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Nonlinear dynamical modeling of primate prefrontal cortex micro-circuits for decision-making neuroprostheses. Neural Interfaces Conference 2012, 2012, F-12.

117. Hampson, R.E., Opris, I., Gerhardt, G.A., Song, D., Berger, T.W., and Deadwyler, S.A. Executive control in primate prefrontal cortex utilizes columnar processing for target selection. Neural Interfaces Conference 2012, 2012, F-9.

118. Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Memory-invariant models of hippocampal CA3-CA1 population dynamics during delayed nonmatch-to-sample tasks. Society for Neuroscience Abstracts, 2011, 410.07.

119. Hampson, R.E., Long, J.L., Noto, J.V., Parrish, B.C., Hong, K.S., Song, D., Chan, H.M., Shin, D., Marmarelis, V.Z., Berger, T.W., Gerhardt, G.A., and Deadwyler, S.A. Facilitation of behavioral performance in NHPs as a test of a nonlinear model-based neural prosthesis. Society for Neuroscience Abstracts, 2011, 410.08.

120. Sweatt, A.J., Hampson, R.E., Song, D., Chan, H.M., Collins, D.C., Riley, M.R., Dyson, C.H., Hiatt, N., Shin, D., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Implementation of a neural prosthesis facilitates normal brain correlates of memory. Society for Neuroscience Abstracts, 2011, 410.09.

121. Roach, S., Lu, U., Song, D., and Berger, T.W. Nonlinear dynamical model for the separation and quantification of pre- and post-synaptic transmission mechanisms. Society for Neuroscience Abstracts, 2011, 449.07.

122. Song, D., and Berger, T.W. Modeling the nonlinear dynamics and nonstationarities underlying spike train transformations in the brain. Joint Statistical Meeting Abstracts, 2011, 114 (206469).

123. Song, D., Wang, H., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Identification of functional hippocampal CA3-CA1 connectivity using a group regularized likelihood method. Society for Neuroscience Abstracts, 2010, 99.28.

124. Lu, U., Song, D., and Berger, T.W. Nonlinear dynamic analyses of single hippocampal neurons before and after long-term potentiation. Society for Neuroscience Abstracts, 2010, 99.9.

125. Berger, T.W., Lu, U., and Song, D. Nonlinear dynamic modeling of sub- and supra-threshold activities of single hippocampal neurons. Society for Neuroscience Abstracts, 2010, 99.11.

126. Chan, R.H.M., Song, D., Goonawardena, A.V., Bough, S., Sesay, J., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Changes of hippocampal CA3-CA1 population nonlinear dynamics in rats learning a memory-dependent task. Society for Neuroscience Abstracts, 2010, 99.12.

127. Sweatt, A.J., Hampson, R.E., Song, D., Chan, H.M., Collins, D.C., Riley, M.R., Dyson, C.H., Marmarelis, V.Z., Berger, T.W., and Deadwyler, S.A. Model-based identification and manipulation of hippocampal ensemble firing patterns uncovers performance correlates common across animals. Society for Neuroscience Abstracts, 2010, 99.25.

128. Hampson, R.E., Song, D., Chan, H.M., Sweatt, A., Fuqua, J., Gerhardt, G.A., Granacki, J., Berger, T.W., and Deadwyler, S.A. Restoration of Hippocampal Function using Patterned Neural Stimulation: Development a Neural Prosthetic using Multi-Input/Multi-Output Modeling of CA3 and CA1. Neural Interfaces Conference 2010, 2010, 96.

129. Song, D., and Berger, T.W. Identification of Neural Functional Connectivity using a Sparse Generalized Volterra Model. Joint Statistical Meetings Abstract, 2010, #206082.

130. Song, D., and Berger, T.W. Generalized Volterra Model of Neural Population Dynamics for Hippocampal Prostheses. Joint Statistical Meetings Abstract, 2009, #304805.

131. Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Functional hippocampal CA3-CA1 connectivity revealed by multiple-input multiple-output nonlinear dynamic models. Society for Neuroscience Abstracts, 2009, 290.2.

132. Hampson, R.E., Song, D., Chan, H.M., Berger, T.W., and Deadwyler, S.A. Similarities in hippocampal firing patterns in CA1 and CA3 related to accuracy of behavioral performance across different rats. Society for Neuroscience Abstracts, 2009, 290.7.

133. Taghva, A., Song, D., and Berger, T.W. Time-delayed mutual information versus cross-correlation in the detection of information transfer between CA3 and CA1 neurons in the rat hippocampus. Society for Neuroscience Abstracts, 2009, 290.1.

134. Chan, H.M., Song, D., and Berger, T.W. Nonstationary Modeling of Hippocampal Nonlinear Dynamics. Society for Neuroscience Abstracts, 2009, 290.4.

135. Lu, U., Song, D., and Berger, T.W. Nonlinear single neuron modeling with dynamic thresholds. Society for Neuroscience Abstracts, 2009, 290.5.

136. Hsiao, M.-C., Song, D., and Berger, T.W. Using a Modeling-Control Paradigm to Regulate CA1 Nonlinear Dynamics. Society for Neuroscience Abstracts, 2009, 209.3.

137. Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Modeling Spike Train Transformations in the Brain Region. Joint Statistical Meetings Abstract, 2008, #301195.

138. Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Generalized Volterra Model for Spike Train Transformations in the Hippocampus. Society for Neuroscience Abstracts, 2008, 695.3.

139. Shi L., Miller F., Collins D., Mcleod G., Song D., Chan H.M., Berger T.W., Hampson R.E., Deadwyler S.A. Effects of local infusion of rimonabant on hippocampal neurons: in vitro results extended to in vivo verification. Society for Neuroscience Abstracts, 2008, 485.26.

140. Chan, H.M., Song, D., and Berger, T.W. Modeling of Non-Stationarities in Hippocampal Nonlinear Dynamics. Society for Neuroscience Abstracts, 2008, 695.16.

141. Lu, U., Song, D., and Berger, T.W. High-Order Non-Parametric Modeling of Single Neuron. Society for Neuroscience Abstracts, 2008, 695.17.

142. Hsiao, M.-C., Song, D., and Berger, T.W. Control theory-based regulation of hippocampal CA1 nonlinear dynamics. Society for Neuroscience Abstracts, 2008, 695.15.

143. Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Functional CA3-CA1 connections and CA3-CA3 interactions during performance of a delayed-nonmatch-to-sample task revealed by multiple-input multiple-output nonlinear dynamic models. Society for Neuroscience Abstracts, 2007, 32, 305.5.

144. Chan, H.M., Song, D., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Tracking temporal evolution of nonlinear dynamics in hippocampus using time-varying kernels. Society for Neuroscience Abstracts, 2007, 32, 305.2.

145. Hampson, R.E., Song, D., Chan, H.M., Shi, L., Collins, V.R., España, R.A., Gerhardt, G.A., Berger, T.W., and Deadwyler, S.A. A nonlinear model that predicts hippocampal CA1 neural ensemble firing during performance of a delayed-nonmatch-to-sample task in rats. Society for Neuroscience Abstracts, 2007, 32, 305.3.

146. Berger, T.W., Song, D., Chan, H.M., Marmarelis, V.Z., Hampson, R.E., and Deadwyler, S.A. A unified nonlinear dynamic model for the transformations of multiple memories involved in the delayed-nonmatch-to-sample task. Society for Neuroscience Abstracts, 2007, 32, 305.4.

147. Lu, U., Song, D., and Berger, T.W. Modeling input-output property of single hippocampal CA1 pyramidal neuron using random-interval EPSP and spike train data. Society for Neuroscience Abstracts, 2007, 32, 305.6.

148. Hsiao, M.-C., Jung, J., Song, D., and Berger, T.W. Modeling CA1 nonlinear dynamics in vitro for a hybrid biological-VLSI hippocampal slice. Society for Neuroscience Abstracts, 2007, 32, 305.1.

149. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Statistical selection of nonlinear dynamic model of spike train to spike train transformation. Annual Conference of Biomedical Engineering Society, 2007.

150. Song, D., Chan, R.H.M., Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. Multiple-Input Multiple-Output Models of Spike Train Transformation in Hippocampus. Biomedical Engineering Society Annual Conference, 2006, 185.

151. Berger, T.W., Courellis, S.H., Deadwyler, S.A., Gerhardt, G.A., Granacki, J.J., Hampson, R.E., Marmarelis, V.Z., and Song, D. Neural Prosthesis for Hippocampus: Biomimetic Microelectronic Implants for Restoring Memory Function. Annual Conference of Biomedical Engineering Society, 2006.

152. Berger, T.W., Courellis, S.H., Deadwyler, S.A., Gerhardt, G.A., Granacki, J.J., Hampson, R.E., Marmarelis, V.Z., and Song, D. A neural prosthesis for hippocampus: concept and theoretical-experimental strategy. Society for Neuroscience Abstracts, 2006, 65.2.

153. Song, D., Rosa H. M. Chan, Marmarelis, V.Z., Hampson, R.E., Deadwyler, S.A., and Berger, T.W. A neural prosthesis for hippocampus: physiologically plausible stochastic nonlinear kernel models of CA3 spike train to CA1 spike train transformation. Society for Neuroscience Abstracts, 2006, 65.3.

154. Ude Lu, Song, D., and Berger, T.W. Modeling input-output property of single hippocampal CA1 pyramidal neuron using random-interval EPSC, EPSP, and spike train datasets. Society for Neuroscience Abstracts, 2006, 65.5.

155. Jung, J., Hsiao, M-C., Song, D., and Berger, T.W. A neural prosthesis for the hippocampus: reproduce hippocampal CA1 output *in vitro* using control theory. Society for Neuroscience Abstracts, 2006, 65.6.

156. Hsiao, M-C., Chan, C-H., Zanos, T., Erinjippurath, G., Ahuja, A., Gholmieh, G., Wills, J., LaCoss, J., Courellis, S.H., Song, D., Granacki, J.J., Marmarelis, V.Z., and Berger T.W. A neural prosthesis for hippocampus: Proof-of-concept using the in vitro slice. Society for Neuroscience Abstracts, 2006, 65.8.

157. Granacki, J.J., Wills, J., LaCoss, J., Srinivasan, V., Courellis, S.H., Hsiao, M-C., Song, D., and Berger, T.W. A neural prosthesis for hippocampus: mixed-signal system-on-chip. Society for Neuroscience Abstracts, 2006, 65.9.

158. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. A double-process presynaptic mechanism of short-term synaptic plasticity in hippocampal CA1 pyramidal cell revealed by nonlinear systems analysis. Society for Neuroscience Abstracts, 2004, 921.18.

159. Xie, X., Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Interaction between short-term neuronal plasticity and synaptic plasticity revealed by nonlinear analysis in dentate granule cells. Society for Neuroscience Abstracts, 2004, 403.19.

160. Wang, Z., Song, D., Xie, X., and Berger, T.W. Impact of probabilistic synaptic release during train stimulation on the induction of frequency-dependent long-term synaptic plasticity. Society for Neuroscience Abstracts, 2004, 403.18.

161. Courellis, S.H., Erinjippurath, G., Song, D., Gholmieh, G., Hsiao, M-C., Marmarelis, V.Z., and Berger, T.W. A biomimetic electronic prosthetic for the hippocampus: nonlinear input/output model of CA3. Society for Neuroscience Abstracts, 2004, 190.2.

162. Ahuja, A., Nasiatka, P., Song, D., Berger, T.W., and Tanguay, A.R. A biomimetic electronic prosthetic for hippocampus: planar conformal multielectrode arrays for VLSI/hippocampal slice interface. Society for Neuroscience Abstracts, 2004, 190.4.

163. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Characterization of presynaptic quantal plasticity using nonlinear systems analysis. Society for Neuroscience Abstracts, 2003, 581.1.

164. Xie, X., Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Characterization of multiple-input interaction of dentate granule cells using nonlinear modeling methods. Society for Neuroscience Abstracts, 2003, 581.2.

165. Wang, Z., Xie, X., Song, D., and Berger, T.W. Pattern of transmitter release at individual hippocampal synapses during train stimulation. Society for Neuroscience Abstracts, 2003, 122.10.

166. Song, D., Wang, Z., Marmarelis, V.Z., and Berger, T.W. Nonlinear system kernel analysis of short-term plasticity in hippocampal CA1 pyramidal cell. Society for Neuroscience Abstracts, 2002, 146.1.

167. Wang, Z., Song, D., and Berger, T.W. Experimental and modeling studies of the contribution of NMDA receptor-channels to the expression of long-term potentiation. Society for Neuroscience Abstracts, 2002, 146.5.

168. Song, D., Xie, X., Wang, Z., and Berger, T.W. Experimental and modeling decomposition of TEA-elicited calcium transients of hippocampal neurons. Society for Neuroscience Abstracts, 2001, 27.719.

169. Song, D., Xie, X., Wang, Z., and Berger, T.W. TEA induces LTP via both T-type voltage-dependent calcium channels and NMDA receptors in CA1 but not dentate gyrus. Society for Neuroscience Abstracts, 2000, 26.618.

170. Xie, X., Song, D., Wang, Z., and Berger, T.W. Comparison of two forms of LTP between hippocampal CA1 and dentate gyrus. Society for Neuroscience Abstracts, 1999, 182.12.