

CURRICULUM VITAE

Dong Song

Department of Biomedical Engineering
University of Southern California

403 Hedco Neuroscience Building
Los Angeles, California 90089-1451
Tel: (213) 740-8063, Fax: (213) 740-5687
Email: dsong@usc.edu

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)

Professional Experience

- 2013 – Present Research Associate Professor
Department of Biomedical Engineering
University of Southern California, Los Angeles, California
- 2006 – 2013 Research Assistant Professor
Department of Biomedical Engineering
University of Southern California, Los Angeles, California
- 2006 – Present Co-Director of Laboratory of Neural 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

Consultant

- 2016 – 2017 Kernel LLC.

Research Interests

- Hippocampal memory prostheses
- Experimental, theoretical and computational studies of the hippocampus
- Combined mechanistic and statistical modeling of nervous systems
- Mechanisms of learning and memory
- High-density conformal multi-electrode array
- Ultraminiaturized bioelectronics systems for neural recording and stimulation

Research Support as PI, Co-PI, and Co-I

- PI: Bioelectronic Systems for Investigating Neural Plasticity (CBET-1343193), INSPIRE, NSF, \$2,999,995, (PI: J. D. Weiland / D. Song), 08/15/2014 – 07/31/2018.
- Co-PI: RAM: Development of a Human Memory Prosthetic (N66001-14-C-4016), DARPA, \$4,812,860, (Co-PIs: S. A. Deadwyler, R. E. Hampson, D. Song, and T. W. Berger), 12/21/2016 – 12/20/2018.
- Co-PI: Flexible Neural Probe Arrays for Large-Scale Cortical and Subcortical Recording (NS099703-01), NIH, U01, \$1,206,249, (PI: E. Meng), 09/30/2016 – 09/30/2019.
- Co-PI: Lyse-and-Attract Cuff Electrodes (LACE) (HR0012-15-2-0006), DARPA, \$669,730, (PI: E. Meng), 03/31/2015 – 03/30/2018.
- Co-PI: Human Memory Prosthesis, Musk Foundation, (PI: T. W. Berger), 2016 – 2017.
- Co-PI: Human Memory Prosthesis, OS Fund, (PI: T. W. Berger), 2016 – 2017.
- Co-I: Predictive Modeling of Bioelectric Activity on Mammalian Multilayered Neuronal Structures in the Presence of Supraphysiological Electric Fields, NIH, U01 (GM104604), \$2,041,888, (PI: G. Lazzi, USC-PI: T. W. Berger), 09/15/2012 – 08/31/2017.
- Co-I: A Nonlinear Model of Hippocampus, NIBIB Biomedical Simulations Resource (Resource Directors: V.Z. Marmarelis and D. D'Argenio), 2013-2018
- Co-PI: Follow-on REMIND Project for Development of a Human Memory Prosthetic, DARPA, \$774,053, (PIs: S. A. Deadwyler and T. W. Berger), 10/01/2015 – 03/31/2016.
- Co-PI: Development of a Human Memory Prosthetic (N66001-14-C-4016), DARPA, \$999,567, (PIs: S. A. Deadwyler and T. W. Berger), 10/01/2014 – 09/30/2015.
- Co-PI: REMIND: Restorative Encoding Memory Integration Neural Device, Option II, DARPA, \$2,388,408, (PIs: S. A. Deadwyler and T. W. Berger), 10/01/2012 – 09/30/2013.
- Co-PI: REMIND: Restorative Encoding Memory Integration Neural Device, DARPA, \$9,457,200, (PIs: S. A. Deadwyler and T. W. 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, 2008 – 2009.

Research Grants Participated as Senior Personnel

- Senior Personnel: Engineering Research Center for Biomimetic MicroElectronics Systems (EEC-0310723), NSF, \$17,000,000, (PI: M. Humayun), 2003 – 2013.
- Senior Personnel: A Nonlinear Model of Hippocampus, NIBIB Biomedical Simulations Resource, \$5,854,519, (Resource Directors: V.Z. Marmarelis and D. D'Argenio), 2003 – 2013.

Grant Reviews

- 2015 University of Texas Systems Neuroscience and Neurotechnology Research Institute Seed Grants (UT BRAIN) reviewer

Honors and Awards

- 2013 Outstanding Paper Award, IEEE Transactions on Neural Systems and Rehabilitation Engineering

- 2008 – 2009 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
- 1991 – 1992 Outstanding Student Award
University of Science and Technology of China, Hefei, China

Teaching Experiences – As Instructor

- 2017 BME 522: Neural Implant Engineering (3.0 units), Department of Biomedical Engineering, USC
- 2013 BME 402: Control and Communication in the Nervous System (3.0 units), Department of Biomedical Engineering, USC
- 2012 BME 502: Advanced Studies of the Nervous System (4.0 units), Department of Biomedical Engineering, USC

Teaching Experiences – As Lecturer

- 2016 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2015 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2015 BME 533: Seminar in Bioengineering, Department of Biomedical Engineering, USC
- 2015 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2014 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2014 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2013 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2013 BME 201: Biomedical Engineering Practice, Department of Biomedical Engineering, USC
- 2012 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2012 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2011 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2010 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2009 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2009 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2008 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2007 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2007 BME 452: Introduction to Biomimetic Neural Engineering, Department of Biomedical Engineering, USC
- 2006 BME 552: Neural Implant Engineering, Department of Biomedical Engineering, USC
- 2005 BME 599: Neural Implant Engineering, Department of Biomedical Engineering, USC

Students and Postdoctoral Fellows Supervised

Xiwei She	Ph.D. Student	2016 – Present
Clayton Bingham	Ph.D. Student	2015 – Present
Shokofeh Naiini	Ph.D. Student	2015 – 2016
Adam Mergenthal	Ph.D. Student	2014 – Present
Andrea Ezis	Ph.D. Student	2014 – 2015

Jeffrey Tanedo	Ph.D. Student	2012 – 2014
Huijin Xu	Ph.D. Student	2011 – Present
Gene Yu	Ph.D. Student	2011 – Present
Brian Robinson	Ph.D. Student	2011 – 2016
Shane Roach	Ph.D. Student	2010 – 2014
Pen-Ning Yu	Ph.D. Student	2009 – Present
Phillip Hendrickson	Ph.D. Student	2005 – 2015
Rosa H. M. Chan	Ph.D. Student	2005 – 2011
Ude Lu	Ph.D. Student	2005 – 2011
Min-Chi Hsiao	Ph.D. Student	2005 – 2009
Min-Chi Hsiao	Post-Doctoral Fellow	2009 – 2016
Samuel Shin	Intern Post-Doctoral Fellow	2015 – 2016
Yi Guo	Intern Post-Doctoral Fellow	2015 – 2016
Tassanai Parittotokkaporn	Intern Ph.D. Student	2011
Sara Madaan	Intern Ph.D. Student	2012 – 2013
Madhuri Harway	Intern Master Student	2013 – 2014
Joomyung Song	Graduate Student	2015 – 2016
Clayton Bingham	Graduate Student	2013 – 2015
Adam Mergenthal	Graduate Student	2013 – 2014
Andrea Ezis	Graduate Student	2013 – 2014
Eric Cabral	Graduate Student	2010 – 2011
Jonathan Arteaga	Graduate Student	2010
Samuel Felix	Graduate Student	2010
Nelson Jen	Graduate Student	2008
Alexandar Taghva	Graduate Student	2007 – 2009
Kang Woo Lee	Undergraduate Student	2012
Allison Wilson	Undergraduate Student	2012
Kevin Xu	Undergraduate Student	2012
Christopher Girard	Undergraduate Student	2011
Richard Ponce	Undergraduate Student	2011
Dea Flores	Undergraduate Student	2010
Adam Baybutt	Undergraduate Student	2010
Alex Katz	Undergraduate Student	2010 – 2011
Nathalie H. Pelka	Undergraduate Student	2007 – 2009
Nora Shnorhokian	Undergraduate Student	2007
Andrew Barajas	Undergraduate Student	2008
Patrick Carriere	Undergraduate Student	2008
Anne Huang	Undergraduate Student	2007
Shengqi Ye	Undergraduate Student	2007
Sophia Chen	High School Student	2016
Brian Li	High School Student	2016
Jane Jing	High School Student	2016
Jamie Chen	High School Student	2015
Helen Song	High School Student	2015
Joanna Hao	High School Student	2014

Dissertation and Qualifying Exam Committees

2016	Kunling Geng	Doctorate Committee at USC
2016	Brian S. Robinson	Doctorate Committee at USC
2015	Boshuo Wang	Doctorate Committee at USC
2015	Phillip Hendrickson	Doctorate Committee at USC
2015	Roman Sandler	Doctorate Committee at USC
2014	Nadav Ivzan	Doctorate Committee at USC
2013	Arvind Iyer	Doctorate Committee at USC
2014	Catherine Y. Tu	Doctorate Committee at Colorado State University
2014	Will X. Y. Li	Doctorate Committee at City University of Hong Kong
2011	Rosa H. M. Chan	Doctorate Committee at USC
2011	Ude Lu	Doctorate Committee at USC
2009	Min-Chi Hsiao	Doctorate Committee at USC
2017	Alex Baldwin	Qualifying Exam Committee at USC
2016	Gene Yu	Qualifying Exam Committee at USC
2015	Brian S. Robinson	Qualifying Exam Committee at USC
2015	Kunling Geng	Qualifying Exam Committee at USC
2014	Roman Sandler	Qualifying Exam Committee at USC
2014	Arvind Iyer	Qualifying Exam Committee at USC
2014	Boshuo Wang	Qualifying Exam Committee at USC
2013	Nadav Ivzan	Qualifying Exam Committee at USC
2013	Curtis D. Lee	Qualifying Exam Committee at USC
2013	Phillip Hendrickson	Qualifying Exam Committee at USC

Services

2016 – 2017	USC Engineering Faculty Council
2017	USC BME Non-Tenure Track Faculty Review Committee

Affiliation in Scientific Societies

1999 – present	Society for Neuroscience, Member
2002 – present	IEEE, Member
2002 – present	IEEE/EMBS, Member
2002 – present	BMES, Member
2008 – present	American Statistical Association (ASA), Member
2014 – present	International Chinese Statistical Association (ICSA), Member

Editorial Activities

Review Editor	Frontiers	2013 – Present
Guest Associate Editor	Frontiers in Neuroscience	2013 – Present
Guest Associate Editor	Frontiers in Neurology	2013 – Present
Editor	Computational and Mathematical Methods in Medicine	2014 – Present
Associate Editor	IEEE Engineering in Medicine and Biology Conference	2015 – Present
Special Issue Editor	Futuristic Neural Prostheses, Frontiers in Neuroscience	2016

Journal and Conference Refereeing

Brain Research
Cancer Informatics
Cognitive Systems Research
Computational Intelligence and Neuroscience
Computational and Mathematical Methods in Medicine
Computers in Biology and Medicine

Frontiers in Neuroengineering
Frontiers in Systems Neuroscience
IEEE Transactions on Circuits and Systems II
IEEE Transactions on Communications
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
Journal of Computational Neuroscience
Journal of Indian Mathematical Society
Journal of Neurophysiology
Journal of Neuroscience Methods
Microelectronics Journal
Neural Computation
Neural Networks
Neurocomputing
Neuroscience Letters
Physica A: Statistical Mechanics and Its Applications
PLOS ONE
Progress in Neuro-Psychopharmacology & Biological Psychiatry
Synapse

Invited Talks

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, 2007.

Chairing and Organization of Sections in Scientific Meetings

- 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. Modeling Nonlinear Systems. Inventors: Song, D., V. Z. Marmarelis, and T. W. Berger. US Patent No.: US 8,463,582 B2, Date of Patent: Jun. 11, 2013.

Publications - Peer-Reviewed Journal Articles

1. 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, 2016, DOI: 10.1109/TNSRE.2016.2604423.
2. Sienkiewicz, E., Song, D., Breidt, F.J., Wang, H. Sparse functional dynamical model – a big data approach. Journal of Computational and Graphical Statistics, 2016, DOI: 10.1080/10618600.2016.1222292.
3. 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, DOI: 10.1162/NECO_a_00883.
4. 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.
5. 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.
6. 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.
7. 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.

8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.

25. 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.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.

41. 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.
42. Song, D., Wang, Z., 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.
43. Song, D., 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.
44. 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.
45. 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.
46. 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 EMBS Special Issue: Toward Biomimetic Microelectronics as Neural Prostheses, 2005, 24, 30-44.
47. 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.
48. 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.
49. 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. Song, D., and Berger, T.W. Characterization of complex brain functions with sparse nonlinear dynamical modeling. In Ioan Opris, and Manuel Casanova (Eds.), The Physics of the Mind and Brain Disorders – Integrated Neural Circuits Supporting the Emergence of Mind. New York, NY: Springer, *under review*.
2. Song, D., and Berger, T.W. Nonlinear dynamical modeling for hippocampal memory prostheses. In Tony Prescott, and Paul Verschure (Eds.), Living Machines: A Handbook of Research in Biomimetic and Biohybrid Systems. Oxford: Oxford University Press, *in press*.
3. 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 Ioan Opris, and Manuel Casanova (Eds.), Recent Advances in the Modular Organization of the Cerebral Cortex. New York, NY: Springer, 2015, 385-405.
4. 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 Ioan Opris, and Manuel Casanova (Eds.), Recent Advances in the Modular Organization of the Cerebral Cortex. New York, NY: Springer, 2015, 367-384.
5. 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 Wim Vanderbauwhede and Khaled Benkrid (Eds.), High-Performance Computing using FPGAs, New York, NY: Springer, 2013, 177-207.
6. 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 Bin He (Ed.), Neural Engineering. New York, NY: Springer, 2013, 725-764.
7. 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 Scott H. Holan, William R. Bell, and Tucker S. McElroy (Eds.), Economic Times Series: Modeling and Seasonality. Boca Raton, FL: Chapman and Hall/CRC, 2012.

8. 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 R. Vertes and R. Stackman (Eds.), Electrophysiological Recording Techniques. New York, NY: Springer, 2011, 215-240.
9. Song, D., and Berger, T.W. Identification of nonlinear dynamics in neural population activity. In Karim G. Oweiss (Ed.), Statistical Signal Processing for Neuroscience and Neurotechnology. Amsterdam: Elsevier, 2010, 103-128.
10. 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 Ivan Soltesz and Kevin Staley (Eds.), Computational Neuroscience in Epilepsy. Amsterdam: Elsevier, 2008, 559-586.
11. 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 M. Akay (Ed.), Neuro-Nanotechnology: Artificial Implants and Neural Prostheses. NY: Wiley/IEEE Press, 2007, 309-336.
12. 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 M. Baudry, S. Schreiber, and X. Bi (Eds.), Synaptic Plasticity: From Basic Mechanisms to Clinical Applications. New York, N.Y.: Taylor and Francis, 2006, 423-457.
13. 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 M. Taketani and M. Baudry (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. Encyclopedia of Computational Neuroscience. New York, NY: Springer, 2014, DOI: 10.1007/978-1-4614-7320-6_558-1.

Publications - Peer-Reviewed conference papers

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.

8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.

24. 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.

41. 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.
42. 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.
43. 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 intracellular subthreshold neuronal activity. Proceedings of the IEEE EMBS Conference, 2012, 767-770.
44. 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.
45. 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.
46. 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.
47. 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.
48. 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.
49. 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.
50. 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.
51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. Song, D., Wang, H., and Berger, T.W. Estimating sparse Volterra models using group $L1$ -regularization. Proceedings of the IEEE EMBS Conference, 2010, 4128-4131.
57. 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.

58. 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.
59. 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.
60. 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.
61. 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.
62. 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.
63. 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.
64. 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.
65. 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.
66. Lu, U., Song, D., and Berger, T.W. Nonparametric modeling of single hippocampal neurons. Proceedings of the IEEE EMBS Conference, 2008, 2469-2472.
67. 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.
68. 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.
69. 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.
70. 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.
71. 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.
72. 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.
73. 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.
74. 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.
75. 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.

76. 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.
77. 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.
78. 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.
79. 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. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. Robinson, B.S., Berger, T.W., and Song, D. Identification of a stable STDP rule from spike timing with generalized multilinear modeling. COSYNE, 2016.
11. 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.
12. 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.

13. Hampson, R.E., Song, D., Robinson, B.S., Witcher, M.R., Couture, D.E., Laxton, A.M., Popli, G., Sollman, M.J., Pettehoff, 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.

31. 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.
32. 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.
33. 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 hippocampus using input-output modeling. IMAG Multiscale Modeling Consortium Meeting, 2014.
34. 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.
35. 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.
36. 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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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.
43. 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.
44. 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.
45. 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.
46. 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.

47. 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.
48. 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.
49. 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.
50. 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.
51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. 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.
58. 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.
59. 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.
60. 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.
61. 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.
62. 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).
63. 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.
64. 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.

65. 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.
66. 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.
67. 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.
68. 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.
69. 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).
70. 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.
71. 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.
72. 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.
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 in rats learning a memory-dependent task. Society for Neuroscience Abstracts, 2010, 99.12.
74. 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.
75. 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.
76. Song, D., and Berger, T.W. Identification of Neural Functional Connectivity using a Sparse Generalized Volterra Model. Joint Statistical Meetings Abstract, 2010, #206082.
77. Song, D., and Berger, T.W. Generalized Volterra Model of Neural Population Dynamics for Hippocampal Prostheses. Joint Statistical Meetings Abstract, 2009, #304805.
78. 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.
79. 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.
80. 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.
81. Chan, H.M., Song, D., and Berger, T.W. Nonstationary Modeling of Hippocampal Nonlinear Dynamics. Society for Neuroscience Abstracts, 2009, 290.4.

82. Lu, U., Song, D., and Berger, T.W. Nonlinear single neuron modeling with dynamic thresholds. Society for Neuroscience Abstracts, 2009, 290.5.
83. 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.
84. 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.
85. 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.
86. 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.
87. Chan, H.M., Song, D., and Berger, T.W. Modeling of Non-Stationarities in Hippocampal Nonlinear Dynamics. Society for Neuroscience Abstracts, 2008, 695.16.
88. Lu, U., Song, D., and Berger, T.W. High-Order Non-Parametric Modeling of Single Neuron. Society for Neuroscience Abstracts, 2008, 695.17.
89. 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.
90. 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.
91. 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.
92. 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.
93. 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.
94. 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.
95. 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.
96. 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.
97. 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.
98. 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.
99. 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.

100. 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.
101. 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.
102. 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.
103. 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.
104. 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.
105. 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.
106. 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.
107. 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.
108. 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.
109. 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.
110. 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.
111. 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.
112. 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.
113. 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.
114. 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.
115. 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.
116. 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.
117. 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.