

SHARON M. CROOK

Curriculum Vitae

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EDUCATION

PhD	Applied Mathematics	University of Maryland, College Park	1996
MA	Applied Mathematics	University of Maryland, College Park	1991
BS	Mathematics	University of Southern Mississippi	1987

PROFESSIONAL INTERESTS

Mathematical and Computational Neuroscience, Neuroinformatics, Data Analysis and Machine Learning, Nonlinear Dynamics and Multiscale Complex Systems, Mathematical Physiology, Computational Biology

ACADEMIC EMPLOYMENT

2025-	Director, Simon A Levin Mathematical, Computational, and Modeling Sciences Center, Arizona State University, Tempe, Arizona
2021-2025	Associate Director for Graduate Programs, School of Mathematical and Statistical Sciences, Arizona State University, Tempe, Arizona
2017-	Professor of Mathematics and Statistics and Life Sciences, Arizona State University, Tempe, Arizona
2010-2017	Associate Professor of Mathematics and Statistics and Life Sciences, Arizona State University, Tempe, Arizona
2004-2010	Assistant Professor of Mathematics and Statistics and Life Sciences, Arizona State University, Tempe, Arizona
2000-2004	Assistant Professor of Mathematics, Department of Mathematics and Statistics, University of Maine, Orono, Maine
1997-2000	Postdoctoral Researcher, Center for Computational Biology, Montana State University, Bozeman, Montana
1995-1997	Guest Research Assistant, Mathematical Research Branch, NIDDK, National Institutes of Health, Bethesda, Maryland
1989-1991	Teaching Assistant, University of Maryland, College Park, Maryland

FELLOWSHIPS AND AWARDS

2022	ASU Faculty Women's Association Outstanding Mentor Award
2020	Charles Wexler Teaching Award
2011	Scottish Informatics and Computer Science Alliance (SICSA) Distinguished Visiting Fellowship
2002	Mathematical Association of America, Project NExT Fellow (New Experiences in Teaching)
1997-1999	NIH Postdoctoral Individual National Research Service Award
1992-1994	NASA Graduate Student Research Fellowship
1987-1989	University of Maryland Graduate School Fellowship
1987	University of Southern Mississippi Student Hall of Fame
1987	University of Southern Mississippi Mathematics Achievement Award

OTHER TRAINING AND AFFILIATIONS

- 2025- Affiliate, NSF-Simons National Institute for Theory and Mathematics in Biology, Northwestern University and University of Chicago
- 2018- Affiliate, School of Life Sciences, Arizona State University
- 2008-2025 Affiliate, Simon A Levin Mathematical, Computational, and Modeling Sciences Center, Arizona State University
- 2011 SICSA Distinguished Visiting Fellow, School of Informatics, University of Edinburgh
- 2011 Long-term Visitor, Computational Neurosciences Group, Norwegian University of Life Sciences
- 2004-2021 Affiliate, Center for Adaptive Neural Systems, Arizona State University
- 2003 Long-term Visitor, Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio
- 1998 Visitor and Participant in Computational Neuroscience Workshop, Institute for Mathematics and its Applications, University of Minnesota, Minneapolis, Minnesota
- 1992 Student, Methods in Computational Neuroscience Course, Marine Biological Laboratory, Woods Hole, Massachusetts
- 1988-1991 Research and Development for Intelligent Data Management, NASA Goddard Space Flight Center, National Space Science Data Center, Greenbelt, Maryland
- 1987 Summer Intern, Laboratory for Atmospheres, NASA Goddard Space Flight Center, Greenbelt, Maryland
- 1985-1986 Summer Research Assistant and Computer Graphics Programmer, Medical University of South Carolina, Department of Anatomy, Charleston, South Carolina

PUBLICATIONS (*indicates mentored student or postdoc)

Peer-reviewed Articles:

- Sinha, A, P Gleeson, B Marin, S Dura-Bernal, S Panagiotou, **S Crook**, M Cantarelli, RC Cannon, US Bhalla, AP Davison, H Gurnani, RA Silver (2024) The NeuroML ecosystem for standardized multi-scale modeling in neuroscience. *eLife*. 13:RP95135 DOI:10.7554/eLife.95135.1
- *Haynes, VR, Y Zhou, **S Crook** (2024) Discovering optimal features for neuron type identification from extracellular recordings. *Frontiers in Neuroinformatics*. 18.1303993. DOI:10.3389/ninf.2024.1303993 PMID: 38371496
- *Birgiolas, J, *VR Haynes, P Gleeson, RC Gerkin, SW Dietrich, **S Crook** (2023) NeuroML-DB: Sharing and characterizing data-driven neuroscience models described in NeuroML. *PLoS Computational Biology*. 19(3):e1010941. DOI:10.1371/journal.pcbi.1010941 PMID: 36867658
- Gleeson, P, **S Crook**, D Turner, K Mantel, M Raunak, T Willke, JD Cohen (2023) Integrating model development across computational neuroscience, cognitive science, and machine learning. *Neuron*. 111(10):1526-1530. DOI:10.1016/j.neuron.2023.03.037 PMID: 37100054
- Eriksson, O, US Bhalla, KT Blackwell, **SM Crook**, D Keller, A Kramer, M Linne, A Saudargiene, RC Wade, J Hellgren Kotaleski (2022) Combining hypothesis- and data-driven neuroscience modeling in FAIR workflows. *eLife*. 11:e69013. DOI:10.7554/eLife.69013 PMID: 35792600
- Eke, DO, A Bernard, JG Bjaalie, R Chavarriaga, T Hanakawa, AJ Hannan, SL Hill, ME Martone, A McMahon, O Ruebel, **S Crook**, E Thiels, F Pestilli (2022) International Data Governance for Neuroscience. *NEURON*. 110(4):600-612. DOI:10.1016/j.neuron.2021.11.017 PMID: 34914921
- Dietrich, SW, D Goelman, J Broatch, **S Crook**, B Ball, K Kobojeck, J Ortiz (2021) Introducing databases in context through customizable visualizations. *Frontiers in Education*. DOI:10.3389/educ.2021.719134.
- Baer, SM, S Chang, **SM Crook**, CL Gardner, JR Jones, C Ringhofer, FR Nelson (2021) A multiscale continuum model of the vertebrate outer retina: The temporal dynamics of background-induced flicker enhancement. *Journal of Theoretical Biology*. DOI:10.1016/j.jtbi.2021.110763. PMID: 34000285
- *Reckell, T, K Nguyen, *T Phan, **SM Crook**, E Kostelich, Y Kuang (2021) Modeling the synergistic properties of

drugs in hormonal treatment for prostate cancer. *Journal of Theoretical Biology*. 514:110570. DOI:10.1016/j.jtbi.2020.110570 PMID: 33422609

- *Ruhani, M, SM Baer, **SM Crook** (2021) A stage-structured population model for activity-dependent dendritic spines, *Journal of Biological Dynamics*. 15(Sup1):s62-s80. DOI:10.1080/17513758.2020.1839136 PMID: 33275073
- Dietrich, SW, D Goelman, J Broatch, **S Crook**, B Ball, K Koboje (2020) Using formative assessment for improving pedagogy. *ACM Inroads*. 11(4):27-34. DOI:10.1145/3430766
- Crook, SM**, AP Davison, RA McDougal, HE Plesser (2020) Editorial: Reproducibility and Rigour in Computational Neuroscience. *Frontiers in Neuroinformatics*. DOI:10.3389/fninf.2020.00023 PMID: 32536859
- *Phan, T, **SM Crook**, AH Bryce, CC Maley, EJ Kostelich, Y Kuang (2020) Review: mathematical modeling of prostate cancer and clinical application. *Applied Science*. 10:2721. DOI:10.3390/app10082721
- Gleeson, P, M Cantarelli, B Marin, A Quintana, M Earnshaw, S Sadeh, E Piasini, *J Birgiolas, RC Cannon, NA Cayco-Gajic, **S Crook**, AP Davison, S Dura-Bernal, A Ecker, ML Hines, G Idili, F Lanore, SD Larson, WW Lytton, A Mujumdar, RA McDougal, S Sivagnanam, S Solinas, R Stanislovas, SJ van Albada, W van Geit, RA Silver (2019) Open Source Brain: a collaborative resource for visualizing, analyzing, simulating and developing standardized models of neurons and circuits. *Neuron*. DOI:10.1016/j.neuron.2019.05.019 PMID: 31201122
- Neal, M, M Koenig, D Nickerson, G Misirli, R Kalbasi, A Drager, K Atalag, V Chelliah, M Cooling, D Cook, **S Crook**, M de Alba, S Friedman, A Garny, J Gennari, P Gleeson, M Golebiewski, M Hucka, N Juty, C Myers, B Oivier, H Sauro, M Scharm, J Snoep, V Toure, A Wipat, O Wolkenhauer, D Waltemath (2018) Harmonizing semantic annotations for computational models in biology. *Briefings in Bioinformatics*. DOI:10.1093/bib/bby087 PMID: 30462164
- Gerkin, RC, *RJ Jarvis, **SM Crook** (2018) Towards systematic, data-driven validation of a collaborative, multi-scale model of *C. elegans*. *Philosophical Transactions of the Royal Society B*. 373:20170381. DOI:10.1098.rstb.2017.0381. PMID: 30201844
- *Birgiolas, J, CM Jernigan, RC Gerkin, BH Smith, **SM Crook** (2017) SwarmSight: Real-time tracking of insect antenna movement and proboscis extension reflex using a common preparation and conventional hardware. *Journal of Visualized Experiments* (130), e56803. DOI:10.3791/56803. PMID: 29364251
- *Birgiolas, J, CM Jernigen, B Smith, **S Crook** (2016) SwarmSight: Measuring the temporal progression of animal group activity levels from natural scene and laboratory videos. *Behavior Research Methods*, 1-12. PMID: 27130170
- *Berger, S, **S Crook** (2015) Modeling the influence of ion channels on neuron dynamics in *Drosophila*. *Frontiers in Computational Neuroscience*. 9:139. DOI:10.3389/fncom/2015.00139. PMID: 26635592
- Gardner, C, *JR Jones, SM Baer, **SM Crook** (2015) Drift-diffusion simulation of the ephaptic effect in the triad synapse of the retina. *Journal of Computational Neuroscience*. 38:129-142. DOI:10.1007/s10827-014-0531-7. PMID: 25260382
- Dietrich, SW, D Goelman, CM Borrer, **SM Crook** (2015) An animated introduction to relational databases for many majors. *IEEE Transactions on Education*. 58(2):81-89. DOI:10.1109/TE.2014.2326834.
- Cannon, RC, P Gleeson, **S Crook**, G Ganapathy, B Marin, E Piasini, RA Silver (2014) LEMS: A language for expressing complex biological models in concise and hierarchical form and its use in underpinning NeuroML 2. *Frontiers in Neuroinformatics*. 8:79. DOI:10.3389/fninf.2014.00079. PMID: 25309419
- *Costela, FM, J Otero-Millan, MB McCamy, S Macknik, XG Troncoso, AN Jazi, **SM Crook**, S Martinez-Conde (2014) Fixational eye movement correction of blink-induced gaze position errors. *PLoS One*. 9(10): e110889. PMID: 25333481
- Vella, M, RC Cannon, **S Crook**, AP Davison, G Ganapathy, HPC Robinson, RA Silver, P Gleeson (2014) libNeuroML and PyLEMS: using Python to combine procedural and declarative modeling approaches in computational neuroscience. *Frontiers in Neuroinformatics*. 8:38. DOI:10.3389/fninf.2014.00038 PMID: 24795618

- *Herrera-Valdez, M, EC McKiernan, *SD Berger, S Ryglewski, C Duch, **S Crook** (2013) Relating ion channel expression, bifurcation structure, and diverse firing patterns in a model of an identified motor neuron. *Journal of Computational Neuroscience*. 34(2):211-229. DOI:10.1007/s10827-012-0416-6 PMID: 22878689
- Crook, SM**, JA Bednar, *SD Berger, RC Cannon, AP Davison, M Djurfeldt, J Eppler, B Kreiner, S Furber, B Graham, M Hull, HE Plesser, L Schwabe, L Smith, V Steuber, S van Albada (2012) Creating, documenting and sharing network models. *Network: Computation in Neural Systems*. 23(4):131-149. PMID: 22994683
- McCamy*, MB, J Otero-Millan, SL Macknik, Y Yang, XG Troncoso, SM Baer, **SM Crook**, S Martinez-Conde (2012) Microsaccadic efficacy and contribution to foveal and peripheral vision. *Journal of Neuroscience*. 32(27):9194-9204. DOI:10.1523/JNEUROSCI.0515-12.2012. PMID: 22764228
- Venugopal, S, TM Hamm, **SM Crook**, R Jung (2011) Modulation of inhibitory strength and kinetics facilitates regulation of persistent inward currents and motoneuron excitability following spinal cord injury. *Journal of Neurophysiology*. 106(5):2167-2179. PMID: 21775715
- *Kurian, M, **SM Crook** and R Jung (2011) Motoneuron models of self-sustained firing after spinal cord injury. *Journal of Computational Neuroscience*. 31(3):625-645. PMID: 21526348
- Gleeson, P, **S Crook**, R Cannon, M Hines, G Billings, M Farinella, TM Morse, A Davison, S Ray, U Bhalla, SR Barnes, YD Dimitrova and RA Silver (2010) NeuroML: a simulator-independent language for describing data-driven models of neurons and networks with a high degree of biological realism. *PLoS Computational Biology*. 6(6): e1000815. DOI:10.1371/journal.pcbi.1000815. PMID: 20585541
- Baer, SM, **S Crook**, *M Dur-e-Ahmad and Z Jackiewicz (2009) Numerical solution of calcium-mediated dendritic branch model. *Journal of Computational and Applied Mathematics*. 229:416-424. DOI:10.1016/j.cam.2008.04.011.
- *Dur-e-Ahmad, M, Z Jackiewicz, B Zubik-Kowal and **S Crook** (2007) A variant of pseudospectral method for activity-dependent dendritic branch model. *Journal of Neuroscience Methods*. 165:306-319. DOI:10.1016/j.jneumeth.2007.06.017.
- Crook, S**, *M Dur-e-Ahmad and SM Baer (2007) A model of activity-dependent changes in dendritic spine density and spine structure. *Mathematical Biosciences and Engineering*. 4:617-631. DOI:10.3934/mbe.2007.4.617.
- Crook, S**, P Gleeson, F Howell, J Svitak and RA Silver (2007) MorphML: Level 1 of the NeuroML standards for neuronal morphology data and model specification. *Neuroinformatics*. 5(2):96-104. PMID: 17873371
- *Qi, W and **S Crook** (2004) Tools for neuroinformatic data exchange: An XML application for neuronal morphology data. *Neurocomputing*. 58-60C:1091-1095. DOI:10.1016/j.neucom.2004.01.171.
- *Eaton, CD, **S Crook**, G Cummins and GA Jacobs (2004) Modeling ion channels from the cricket cercal sensory system. *Neurocomputing*. 58-60:409-415. DOI:10.1016/j.neucom.2004.01.074.
- Cummins, GI, **SM Crook**, AG Dimitrov, T Ganje, GA Jacobs and JP Miller (2003) Structural and biophysical mechanisms underlying dynamic sensitivity of primary sensory interneurons in the cricket cercal sensory system. *Neurocomputing*. 52:45-52. DOI:10.1016/S0925-2312(02)00786-5.
- Crook, S**, J Miller and G Jacobs (2002) Modeling frequency encoding in the cricket cercal sensory system. *Neurocomputing* 44:769-773. DOI:10.1016/S0925-2312(02)00470-8.
- Crook, SM**, GB Ermentrout and JM Bower. (1998) Spike frequency adaptation affects the synchronization properties of cortical networks. *Neural Computation* 10:837-854. DOI:10.1162/089976698300017511. PMID: 9573408.
- Crook, SM**, GB Ermentrout and JM Bower (1998) Dendritic and synaptic effects in systems of coupled cortical oscillators. *Journal of Computational Neuroscience* 5:315-329. PMID: 9663554
- Crook, SM**, GB Ermentrout, MC Vanier and JM Bower (1997) The role of axonal delay in the synchronization of networks of coupled cortical oscillators. *Journal of Computational Neuroscience* 4:161-172. PMID: 9154522
- Crompton, RF and **S Crook** (1989) An intelligent user interface for browsing satellite data catalogs. *Telematics and Informatics* 6:299-312. DOI:10.1016/S0736-5853(89)80023-1.

Peer-reviewed Conference Proceedings:

- *Faucon, P, P Balachandran, **S Crook** (2017) SNaReSim: Synthetic Nanopore Read Simulator. *Proceedings of the 2017 IEEE International Conference on Healthcare Informatics*, DOI:10.1109/ICHI.2017.98.
- *Samavat, M, *D Luli, **SM Crook** (2016) Neuronal network models for sensory discrimination. *Proceedings of 2016 50th Asilomar Conference on Signals, Systems and Computers*, 1066-1073
DOI:10.1109/ACSSC.2016.7869533. PMID: 29881246
- *Birgiolas, J, S Dietrich, **S Crook**, A Rajadesingan, C Zhang, S Velugoti Panchala, V Addepalli (2015) Ontology-assisted keyword search for NeuroML models. In Amarnath Gupta and Susan Rathbun, Eds, *Proceedings of the 27th International Conference on Scientific and Statistical Database Management*, ACM, New York, NY. Article 37. DOI:10.1145/2791347.2791360.
- Crook, S**, D Beeman, P Gleeson and F Howell (2005) XML for model specification in neuroscience: An introduction and workshop summary. *Brains, Minds, and Media*. 1:bmm228 (urn:nbn:de:0009-3-2282).
- Jacobs, GA, K Hodge, **S Crook**, J Roddey and S Paydar (1998) Spatio-temporal activity patterns encode direction and dynamics in the cricket cercal system, *Proceedings of the 5th International Congress of Neuroethology*.
- Crook, SM** and GB Ermentrout (1997) An analysis of the adaptive behavior of piriform cortex pyramidal cells. In *Computational Neuroscience Trends in Research 1997*, JM Bower (Ed.), Springer, Boston, MA, 65-70.
- Ermentrout, GB, **S Crook** and JM Bower (1996) Connectivity, axonal delay, and synchrony in cortical oscillators. In *Computational Neuroscience Trends in Research 1995*, JM Bower (Ed.), Academic Press, 167-172.
- Cromp, RF and **SM Crook** (1991) Automated extraction of metadata from remotely sensed satellite imagery. *ACSM-ASPRS Annual Convention* 3:111-120.

Book Chapters:

- Birgiolas, J, R Gerkin, **SM Crook** (2018) Software and resources for computational neuroscience. In Cutsuridis, Graham, Cobb, Vida (eds.) *Hippocampal Microcircuits: A Computational Modeler's Resource Book*, Springer.
- Crook, SM**, HE Plesser, AP Davison (2013) Learning from the past: approaches for reproducibility in computational neuroscience. In JM Bower, ed. *20 Years of Computational Neuroscience*, Springer.
- Gleeson, P, V Steuber, RA Silver and **S Crook** (2012) NeuroML. In Le Novere, ed. *Computational Systems Biology*, Springer.
- Venugopal, S, **S Crook**, M Srivatsan and R Jung (2011) Principles of computational neuroscience. In Jung, ed. *Biomimetic and Biohybrid Living-Hardware Systems*, Wiley.
- Günay, C, TG Smolinski, WW Lytton, TM Morse, P Gleeson, **S Crook**, V Steuber, A Silver, H Voicu, P Andrews, H Bokil, H Maniar, C Loader, S Mehta, D Kleinfeld, D Thomson, PP Mitra, G Aaron and J-M Fellous (2008) Computational intelligence in electrophysiology: Trends and open problems. In Smolinski, Milanova and Hassanien, eds. *Applications of Computational Intelligence in Biology*, Springer, Berlin/Heidelberg.
- Crook, S** and F Howell (2007) XML for data representation and model specification. in Crasto, ed. *Methods in Molecular Biology Book Series: Neuroinformatics*, Humana Press. PMID: 18368360
- Crook, S** and A Cohen (1995) Central pattern generators. In Bower and Beeman, eds. *The Book of GENESIS: A workbook of tutorials for the GEneral NEural Simulation System*, Chapter 6. TELOS Publishers.

Published Abstracts:

- *Hughes, D, L Ruhter, Y Zhang, BB Braden, **S Crook** (2025) Structural and functional graph measures: differences between aging autistic and neurotypical populations and correlations with longitudinal cognitive change scores. *Society for Neuroscience Abstracts*.
- *Doxey, K, Y Zhou, **SM Crook** (2025) Uncovering neuron type diversity in the auditory cortex of marmosets through unsupervised machine learning analysis. *Society for Neuroscience Abstracts*.

- * Smith, EA, J Birgiolas, RC Gerkin, **S Crook** (2024) Spike synchrony in mitral and tufted cell subnetworks in OB subcircuit model. *Society for Neuroscience Abstracts*.
- *Doxey, KE, *V Haynes, Y Zhou, **S Crook** (2023) Neuron-type identification using spatiotemporal features of extracellular recordings. *Society for Neuroscience Abstract*, 118.10.
- *Smith, EA, *KE Doxey, *J Birgiolas, RC Gerkin, **SM Crook** (2023) Modeling the role of ketamine on excitation-inhibition balance in the olfactory bulb. *Society for Neuroscience Abstracts*, 577.14.
- *Dudebout, EM, WD Van Horn, **S Crook** (2023) Mathematical model for TRPM8 dynamics in cold sensory neurons. *Society for Neuroscience Abstracts*, 118.16.
- *Rouhani, M, **SM Crook**, JJ Abbas (2021) Recruitment profiles produced by intra-fascicular stimulation of peripheral nerve fibers. *Journal of Computational Neuroscience*. 49 (Suppl 1):S26.
- *Jarvis, JJ, RC Gerkin, **SM Crook** (2020) Large scale discrimination between neural models and experimental data. *BMC Neuroscience*.
- *Birgiolas, J, RC Gerkin, **SM Crook** (2020) Biophysically realistic model of mouse olfactory bulb gamma fingerprint. *BMC Neuroscience*.
- *Birgiolas, J, *R Jarvis, *V Haynes, R Gerkin, **S Crook** (2019) Automated assessment and comparison of cortical neuron models. *BMC Neuroscience*, 20(Suppl 1):P47.
- *Haynes, V, **SM Crook** (2018) Interlaminar contributions to auditory feature processing. *BMC Neuroscience*, 19(Suppl 2):P215.
- *Birgiolas, J, R Gerkin, **SM Crook** (2018) Rapid selection of NeuroML models via NeuroML-DB.org. *BMC Neuroscience*, 19(Suppl 2):P216.
- Gerkin, R, *RJ Jarvis, **SM Crook** (2018) Multiscale model validation with SciUnit. *BMC Neuroscience*, 19(Suppl 2):P217.
- *Jarvis, R, **SM Crook**, RC Gerkin (2017) Parallel model optimization against experimental neuron physiology data with DEAP and NeuronUnit. *Frontiers in Neuroinformatics Conference Abstract: 10th INCF Congress of Neuroinformatics*.
- *Birgiolas, J, CM Jernigan, RC Gerkin, BH Smith, **SM Crook** (2016) SwarmSight: Real-time insect antenna and proboscis tracking. *Society for Neuroscience Abstracts*, 97.05.
- *Haynes, R, *M Samavat, *D Luli, **S Crook** (2016) The role of connectivity patterns in a computational model of Drosophila Antennal Lobe. *Society for Neuroscience Abstracts*, 430.13.
- *Birgiolas, J, R Gerkin, **SM Crook** (2016) Is the model any good? Objective criteria for computational neuroscience model selection. *BMC Neuroscience 17 (Suppl 1), O10*.
- Crook, SM**, S Dietrich (2014) Model exchange with the NeuroML model database. *BMC Neuroscience 15(Suppl 1): P171*.
- Cannon, R, P Gleeson, **S Crook**, A Silver (2013) Reducing duplication and redundancy in declarative model specifications. *Frontiers in Neuroinformatics. Conference Abstract: 5th INCF Congress of Neuroinformatics*. DOI: 10.3389/conf.fninf.2013.08.00008
- *Berger, SD, SM Baer, **SM Crook** (2013) A continuum approach to model neurites/dendrites with emerging subtrees. *BMC Neuroscience*. 14(Suppl 1):P73.
- *Berger, S, S Baer, **S Crook** (2012) Estimation of electrical properties of dendrites with branches using a continuum modeling formulation. *Society for Neuroscience Abstracts*, 340.01.
- Gleeson P, E Piasini, **S Crook**, R Cannon, V Steuber, D Jaeger, S Solinas, E D'Angelo, RA Silver (2012) The Open Source Brain Initiative: enabling collaborative modelling in computational neuroscience. *BMC Neuroscience*. 13(Suppl 1):O7.
- Cannon, R, P Gleeson, **S Crook**, RA Silver (2012) A declarative model specification system allowing NeuroML to be extended with user-defined component types. *BMC Neuroscience*. 13(Suppl 1): P42.
- Smith A, M Cruz-Aponte, EC McKiernan, **S Crook**, M Herrera-Valdez (2011) Differential contribution of A-type potassium currents in shaping neuronal responses to synaptic input. *BMC Neuroscience*.12:P147.
- Gleeson P, **S Crook**, A Silver, R Cannon (2011) Development of NeuroML version 2.0: Greater extensibility,

support for abstract neuronal models and interaction with Systems Biology languages. *BMC Neuroscience*. 12:P29.

- *Herrera-Valdez MA, *SD Berger, C Duch, **S Crook** (2010) Differential contribution of voltage-dependent potassium currents to neuronal excitability, *BMC Neuroscience*, 11:P159.
- *Chang, S, SM Baer, **SM Crook**, CL Gardner, C Ringhofer (2009) Computational study of cat retinal cone-horizontal cell interaction, *Society for Neuroscience Abstracts*, 557.13.
- Venugopal, S, **S Crook**, T Hamm, R Jung (2009) A computational study of the interaction between persistent inward currents and recurrent inhibition in alpha motoneurons before and after spinal cord injury, *Society for Neuroscience Abstracts*, 657.10.
- Crook, S**, P Gleeson, RA Silver (2009) Describing and exchanging models of neurons and neuronal networks with NeuroML, *BMC Neuroscience*, 10:L1.
- *Berger, SD, *MA Herrera-Valdez, C Duch and **S Crook** (2009) Passive current transfer in wildtype and genetically modified *Drosophila* motoneuron dendrites, *BMC Neuroscience*, 10:P346.
- Venugopal, S, *M Kurian, **S Crook** and R Jung (2009) Role of inhibition in the suppression of alpha-motoneuron hyper-excitability following chronic spinal cord injury, *BMC Neuroscience*, 10:P343.
- Dacher, M, **SM Crook** and BH Smith (2008) Spatio-temporal activity of neurons in the insect antennal lobe: A data driven computational model, *Chemical Senses*, 33(8):S66
- *Kurian, MP, **S Crook** and R Jung (2008) Modeling changes in motoneuron morphology after spinal cord injury, *Society for Neuroscience Abstracts* (#469.12)
- Gleeson, P, **S Crook**, S Barnes, RA Silver (2008) Interoperable model components for biologically realistic single neuron and network models implemented in NeuroML. *Frontiers in Neuroscience*. Conference abstract: Neuroinformatics 2008. DOI: 10.3389/conf.neuro.11.2008.01.135
- *McCamy, M, S Baer and **S Crook** (2008) A stage-structured population approach for modeling activity-dependent plasticity of dendritic spines. *BMC Neuroscience*. 9(1):P104.
- *Chang, S, S Baer, **S Crook**, C Gardner and C Ringhofer (2008) Modeling the GABA and ephaptic feedback mechanisms in cat outer retina, *BMC Neuroscience*. 9:P110.
- *Kurian, MP and **SM Crook** (2007) Modeling motoneuron excitability following spinal cord injury, *Society for Neuroscience Abstracts* (#76.6).
- Crook, S**, P Gleeson and RA Silver (2007) NetworkML: Level 3 of the NeuroML standards for multiscale model specification and exchange, *Society for Neuroscience Abstracts* (#102.28)
- *Jennings, AB, **S Crook**, C Duch and S Ryglewski (2007) Mathematical models of octopaminergic dorsal unpaired median neurons, *Society for Neuroscience Abstracts* (#536.20).
- *Dur-e-Ahmad, M, **S Crook** and S Baer (2007) A model of activity-dependent changes in dendritic spine density and spine structure, *BMC Neuroscience*. 8:P91.
- Gleeson, P, **S Crook**, V Steuber and RA Silver (2007) Using NeuroML and neuroConstruct to build neuronal network models for multiple simulators, *BMC Neuroscience*. 8:P1.
- *Kurian, MP and **S Crook** (2007) Two-compartment models of spasticity in spinal motor neurons following spinal cord injury, *BMC Neuroscience*. 8:P101.
- Crook, SM**, *M Dur-e-Ahmad, SM Baer and Z Jackiewicz (2006) A model of activity-dependent changes in dendritic spine density and spine structure, *Society for Neuroscience Abstracts* (#135.8).
- Mahaffy, MD, **SM Crook**, GA Jacobs and JP Miller (2000) Frequency tuning properties of primary sensory interneurons in the cricket cercal sensory system, *Society for Neuroscience Abstracts* (#55.5).

Edited:

Reproducibility and Rigour in Computational Neuroscience, *Frontiers in Neuroinformatics*, Topic Editors: **S Crook**, AP Davison, RA McDougal, HE Plesser, 2017-2018 (15 articles with over 75,000 views as of December 2019)

Producing and Analyzing Macro-Connectomes: Current State and Challenges, *Frontiers in Neuroinformatics*,

Topic Editors: M Bota, **S Crook**, M Kaiser. 2014-2015 (9 articles with over 60,000 Views on Frontiers as of December 2019)

Other:

Crook, Sharon Marie (1996) The role of delay in oscillatory models of olfactory cortex. *PhD Dissertation*, University of Maryland, College Park, Maryland.

Crook, S (1987) Remarks on the convergence of pi. *Journal of Undergraduate Mathematics*, 19(1):15-22.

Crook, S (1986) Algorithms for computer generation of surfaces. *Journal of Undergraduate Mathematics*, 18(2):51-54.

SPONSORED RESEARCH

- 06/01/20-05/31/25 NIH R01DC019278, PI: Zhou, *CRCNS Research Proposal: Visual modulation of panoramic auditory spatial processing*, \$1,484,453, Role: Co-I (50%)
- 07/01/18-06/30/23 NIH R25NS107188, PI: Neisewander, *Workforce Inclusion in Neuroscience through Undergraduate Research Experience (WINURE)*, \$1,270,790, Role: Mentor
- 02/01/18-01/31/20 NIH F31DC016811, PI: Birgiolas, *Integrated Understanding of Tufted and Mitral Pathways in the Olfactory Bulb*, \$120,651, Role: Internal PI/Research Advisor (50%)
- 09/05/15-06/30/19 NIH R01MH106674, PI: Crook, *Tools for Model Discovery, Validation and Selection in Neuroscience with NeuroML*, \$1,505,557 (45%)
- 09/30/15-07/31/18 NIH R01EB021711, PI: Gerkin, *CRCNS Data Sharing: Exchange and Evaluation of Reduced Neuron Models*, \$393,020, Role: Co-I (40%)
- 09/01/14-08/31/15 NSF CISE-IIS, PI: Smith, *2014 CRCNS PI Conference*, \$29,813, Role: Co-I (50%)
- 09/01/14-08/31/17 NSF DUE 1431848, PI: Dietrich, *Collaborative Research: Databases for Many Majors: Customized Visualizations to Improve STEM Learning*, \$222,982, Role: Senior Personnel (5%)
- 09/01/11-08/31/15 NIH R01 EB014640, National Institute of Biomedical Imaging and Bioengineering, PI: Crook, *CRCNS Data Sharing: NeuroML Database for Multiscale Models in Neuroscience*, \$315,064 (50%)
- 06/01/11-08/31/11 Norway Research Council Travel Grant, 119,000 NOK (~\$21,444) through Norwegian University of Life Sciences
- 07/01/09-06/30/15 NIH R01 MH081905, National Institute of Mental Health, PI: Crook *NeuroML: Standards and Tools for Multiscale Model Specification and Exchange*, \$894,282 (80%)
- 01/01/10-12/31/12 NSF DUE-0941584, PI: Dietrich, *Collaborative Research: Databases for Many Majors: A Student-Centered Approach*, \$49,884, Role: Senior Personnel (5%)
- 03/01/09-02/28/10 NSF IIS-0912814 (International Travel Award), PI: Crook, *NeuroML Development Workshop: Biophysical Single Cell Modeling*, \$10,050 (100%)
- 2/01/09 International Neuroinformatics Coordinating Facility Workshop Proposal, Organizers: Silver, Gleeson, and Crook, *NeuroML Development Workshop: Biophysical Single Cell Modeling*, ~\$9,000 (Through UCL)
- 09/03/07-09/03/12 NSF DMS, PI: Kostelich, *CSUMS: Undergraduate Research Experience for Computational Math Science Majors at ASU*, \$1,029,404 Role: Co-PI (8%)
- 09/01/07-08/31/10 NSF DMS 0718308, PI: Baer, *Multiscale Modeling of the Neural Subcircuits in the Outer-Plexiform Layer of the Retina*, \$642,671 Role: Co-PI (20%)
- 10/01/06-09/30/09 NSF IIS-0613404 PI: Crook, *CRCNS: Behaviorally Relevant Neuronal Modification during Postembryonic Development*, \$457,654 (50%)
- 08/15/05-07/31/08 NSF SBE, PI: Jung, *CATALYST Center of Excellence in Adaptive Neuro-Biomechatronic Systems (CEANS)*, \$110,944 Role: core faculty (8%)
- 08/15/01-07/31/05 NSF IOS-0091117, PI: Crook, *Collaborative Research: A Dynamic Atlas of the Cricket*

- 12/15/02-11/30/07 *Cercal Sensory System*, \$240,798 (100%)
 NSF IGERT, PI: Knowles, *Predoctoral Training in Functional Genomics of Model Organisms*, Role: core faculty
- 09/01/97-08/30/99 NIH NS010545, Individual National Research Service Award F32, Postdoctoral Research Grant, *A Mechanistic Basis for Neural Encoding*, \$49,700

RECENT PRESENTATIONS (*indicates mentored student or postdoc)

Invited Conference Presentations:

- 2019 Archival and search of NeuroML models and model components, Open Source Brain Workshop, Alghero, Italy
- 2018 Rigor and reproducibility in computational neuroscience, Practical approaches to research data management and reproducibility Satellite Workshop of the Bernstein Conference, Berlin, Germany
- 2018 Reproducibility and rigour: testing the data driven model, (plenary speaker), Neuroinformatics Congress of the INCF, Montreal, Canada
- 2018 Reproducibility and rigour: testing the data driven model in *C. elegans*, Royal Society Meeting: Connectome to behaviour: modelling *C. elegans* at cellular resolution, London, UK
- 2017 Reproducibility and rigour: testing the data driven model, Biofest, University of Maryland, College Park, Maryland
- 2016 Rigor and reproducibility in computational neuroscience: Model development, exchange and evaluation, BARCCSYN 2016, Barcelona, Spain
- 2015 Collaborative development of neural models with NeuroML, 2015 COMBINE (Computational Modeling in Biology Network) Meeting, Salt Lake City, Utah
- 2014 A continuum approach for exploring the role of neuronal structure, Nonlinear Dynamics and Stochastic Methods: From Neuroscience to Other Biological Applications, Conference in Honor of Bard Ermentrout's 60th Birthday, Pittsburgh, Pennsylvania
- 2012 Approaches for model reproducibility in computational science, Conference on Multiscale Modelling in Medicine and Biology, University of Nottingham, Nottingham, UK
- 2010 Lessons from the past: Approaches for reproducibility in computational neuroscience, Symposium: 20 Years of Computational Neuroscience, CNS 2010, San Antonio, Texas

Invited Seminar Presentations:

- 2026 Data-driven modeling of the dynamics of cold-sensitive neurons, University of South Carolina, Columbia, SC
- 2020 Data driven modeling in neuroscience: a mathematical success story, University of North Carolina, Greensboro, NC
- 2019 Testing data-driven models in neuroscience, Precision Neurotherapeutics Innovation Program, Department of Neurosurgery, Mayo Clinic Arizona
- 2018 Data driven modeling in neuroscience: a mathematical success story, Dartmouth College, Mathematical Colloquium
- 2017 Reproducibility and rigor in computational science, University of Arizona Modeling and Computation Seminar Series
- 2015 Predicting network behavior based on the behavior of individual elements, Faculty Panel: Organismal, Integrative and Systems Biology, School of Life Sciences, Life Sciences Cafe
- 2015 How I use mathematics to understand the brain, Virginia Commonwealth University, Department of Mathematics Colloquium Series
- 2015 How I use mathematics to understand the brain, University of Southern Mississippi, Department of Mathematical Sciences Colloquium Series

- 2011 Describing and exchanging models of neurons and neuronal networks with NeuroML, SICSA Distinguished Visitor Seminar, University of the West of Scotland, Paisley, UK
- 2011 Approaches for reproducibility in computational neuroscience, SICSA Distinguished Visitor Seminar, University of Stirling, Stirling, UK
- 2011 Approaches for reproducibility in computational neuroscience, Neuroinformatics and Computational Neuroscience Doctoral Training Center Day, School of Informatics, University of Edinburgh, Edinburgh, UK
- 2011 A continuum model for structural plasticity of dendritic spines, SICSA Distinguished Visitor Seminar, University of Edinburgh, Edinburgh, UK
- 2011 Cell physiology models: the role of calcium in excitability and cell signaling, Mini-workshop, Norwegian University of Life Sciences, Aas, Norway
- 2011 Challenges in multi-scale modeling: Connecting biophysical mechanisms to behavior, Computational Neuroscience Seminar, Norwegian University of Life Sciences, Aas, Norway
- 2010 NeuroML: Model description language for multiscale neuroscience models, Brain Corporation, San Diego, California

Contributed Conference Presentations:

- 2024 Dynamics and Data: Integration and Collaboration, ASU/BNI Neuro-Engineering and Computational Neuroscience Symposium
- 2019 NeuroML-DB: A model sharing resource that promotes rapid selection and reuse, International Neuroinformatics Coordinating Facility Congress, Warsaw, Poland

Research Workshops and Symposia:

- 2026 Organizer, Data, Dynamics, Discovery: Next Generation Biomedical Modeling, Arizona State University
- 2025 Organizer, NEURON Course, Arizona State University (organizer and guest speaker)
- 2024 Organizer, Workshop on Exploring Neural Data from the Allen Institute for Neural Dynamics, ASU
- 2022 NeuroML Breakout, Harmony Codefest of the COMBINE (Computational Modeling in Biology Network) Initiative (speaker and participant)
- 2021 Towards multipurpose neural network models: II model testing and model fitting, Testing the data driven model, European Institute for Theoretical Neuroscience, International Workshop, (invited speaker)
- 2021 Report from the International Brain Initiative Data Standards and Sharing Working Group, INCF Assembly (speaker)
- 2021 FAIR in Computational Neuroscience Session 3, INCF Assembly (speaker and moderator)
- 2020 International BRAIN Initiative Data Sharing Meeting, Tokyo, Japan (speaker and panelist)
- 2018 OpenWorm Open House and Hackaton, University College London, London, UK (participant)
- 2017 NICT-NSF Collaborative Workshop on Computational Neuroscience, Osaka, Japan (speaker, policy)
- 2016 Workshop on Data Driven Models (speaker, moderator), HHMI Janelia Campus
- 2015 Joint NeuroML and Open Source Brain Workshop (moderator), Alghero, Sardinia, Italy
- 2014 Joint NeuroML and Open Source Brain Workshop (moderator, speaker), Alghero, Sardinia, Italy
- 2014 Collaborative Research in Computational Neuroscience PI Meeting, Workshop on Open Science and Resources for Computational Neuroscience, ASU (organizer, speaker, moderator), Tempe, Arizona
- 2013 Joint NeuroML and Open Source Brain Workshop (organizing committee and speaker), Alghero, Sardinia, Italy
- 2013 Diverse Mathematical Approaches for Understanding Information Processing in Neuronal Networks (organizer and moderator), Minisymposium, Society for Mathematical Biology Meeting 2013, Tempe, Arizona

- 2012 4th Annual NeuroML Development Meeting (organizer and moderator), University of Edinburgh, Edinburgh, UK
- 2011 Creating, Documenting, and Sharing Network Models (organizer and speaker), University of Edinburgh, Edinburgh, UK
- 2011 INCF sponsored neuroinformatics workshop on Emerging standards for network models (Speaker), NeuroML: Status and Future Directions, CNS 2011, Stockholm, Sweden
- 2010 INCF sponsored neuroinformatics workshop (Speaker), NeuroML modules for multiscale model descriptions in neuroscience, CNS 2010, San Antonio, Texas
- 2010 NeuroML development workshop (Co-organizer with P Gleeson, A Silver and R Cannon), Arizona State University, Tempe, Arizona

Poster and Demo Presentations:

- 2026 *Hughes, D, SM Crook, BB Braden, Relationships between connectivity and longitudinal memory decline using network analysis and partial least squares, 2026 Annual Computational Neuroscience Meeting, Halifax, Nova Scotia, Canada
- 2026 *Doxey, K, *B Amtsfield, SM Crook, Yi Zhou, Unsupervised machine learning analysis of extracellular waveforms, 2026 Annual Computational Neuroscience Meeting, Halifax, Nova Scotia, Canada
- 2026 *Doxey, K, S Crook, T Balmer, Modeling of dorsal cochlear nucleus reveals connectivity underlying response profiles, Association for Research in Otolaryngology 2026, Puerto Rico
- 2025 *Hughes, D, L Ruhter, Y Zhang, BB Braden, S Crook, Structural and functional graph measures: differences between aging autistic and neurotypical populations and correlations with longitudinal cognitive change scores, Society for Neuroscience, San Diego, California
- 2025 *Doxey, K, Y Zhou, SM Crook, Uncovering neuron type diversity in the auditory cortex of marmosets through unsupervised machine learning analysis, Society for Neuroscience, San Diego, California.
- 2025 *Hughes, D, S Crook, The effect of thresholding on group comparison in graph theory metrics, NITMB Convergence Conference, Chicago, Illinois
- 2025 Knight, D, *K Doxey, S Crook, K Cochran, Using social network analysis as an assessment of team science across two academic research networks, International Science of Team Science (INSciTS) Conference, online
- 2025 *Hughes, D, S Crook, BB Braden, Structural and functional brain differences in autistic aging using graph theoretical analysis, 2025 International CNS Meeting, Florence, Italy
- 2025 *Doxey, K, S Crook, T Balmer, The role of descending inferior colliculus projections to the cochlear nucleus in the hyperactivity underlying tinnitus, 2025 International CNS meeting, Florence, Italy
- 2024 *Smith, EA, J Birgiolas, RC Gerkin, S Crook, Spike synchrony in mitral and tufted cell subnetworks in OB subcircuit model, Society for Neuroscience, Chicago, Illinois
- 2024 *Hughes, D, *K Doxey, BB Braiden, S Crook, Mathematical models of autistic aging using The Virtual Brain, SIAM Life Sciences Meeting, Portland, Oregon
- 2023 Cochran, *K, D Knight, Doxey, *L Coleman, S Crook, NeuroNex Investigators Meeting 2023, Washington DC
- 2023 *Doxey, K, *E Smith, *J Birgiolas, R Gerkin, S Crook, Modeling gamma oscillations and high-frequency oscillations in the rodent olfactory bulb. 2023 Internatinal CNS Meeting, Leipzig, Germany
- 2022 *Nguyen, D, *V Haynes, S Crook, Y Zhou, High-density eletrode probes reveal heterogeneous functions of auditory cortex neurons. 2022 Advances and Perspectives in Auditory Neuroscience
- 2021 *Rouhani, M, SM Crook, JJ Abbas, Recruitment profiles produced by intra-fascicular stimulation of peripheral nerve fibers. 2021 International CNS Meeting, Online
- 2021 Crook, S, T Kokan, and the IBI Data Standards and Sharing Working Group Training Task Force, Training Activities of the IBI Data Standards and Sharing Working Group, 2021 US BRAIN Initiative PI Meeting, Online

- 2021 Abbas, J, R Jung, Y Bornat, F Kolbl, L McPherson, A Thota, L Regnacq, A Ortega, *M Rouhani, O Romain, S Crook, S Renaud, Improving selectivity with intrafascicular stimulation: computational and experimental studies. 2021 US BRAIN Initiative PI Meeting, Online
- 2021 *Haynes, V, Y Zhou, S Crook, A simulation-based machine learning approach to demixing EAP sources for extracellular morphological characterization, INCF Assembly, Online
- 2020 *Jarvis, RJ, RC Gerkin, SM Crook, Large scale discrimination between neural models and experimental data. 2020 Computational Neuroscience Meeting, Melbourne, Australia and Online.
- 2020 *Birgiolas, J, RC Gerkin, SM Crook, Biophysically realistic model of a mouse olfactory bulb gamma fingerprint. 2020 Computational Neuroscience Meeting, Melbourne, Australia and Online.
- 2020 Abbas, J, R Jung, Y Bornat, F Kolb, L McPherson, A Thota, O Romain, A Ortega, *M Rouhani, S Crook, S Renaud, Improving selectivity with intrafascicular stimulation: mathematical models, hardware, and experimentation. BRAIN Initiative Investigators Conference, Virtual.
- 2019 *Birgiolas, J, *V Haynes, *RJ Jarvis, R Gerkin, SM Crook, NeuroML-DB: A model sharing resource that promotes rapid selection and reuse, International Neuroinformatics Coordinating Facility Congress, Warsaw, Poland
- 2019 *Birgiolas, J, *R Jarvis, *VR Haynes, RC Gerkin, SM Crook, Automated assessment and comparison of cortical neuron models, 2019 Computational Neuroscience Meeting, Barcelona, Spain
- 2018 *Birgiolas, J, R Gerkin, S Crook, Rapid selection of NeuroML models via NeuroML-DB.org, 2018 Computational Neuroscience Meeting, Seattle, Washington
- 2017 *Jarvis, RJ, SM Crook, RC Gerkin, Optimization of Reduced Models against Diverse Experimental Neuron Physiology Datasets with NeuronUnit, CRCNS PI Meeting, Providence, Rhode Island (by Rick Gerkin)
- 2017 *Jarvis, R, SM Crook, RC Gerkin, Parallel model optimization against experimental neuron physiology data with DEAP and NeuronUnit. 2017 INCF Congress, Kuala Lumpur, Malaysia
- 2016 *Birgiolas, J, R Gerkin, SM Crook, Is the model any good? Objective criteria for computational neuroscience model selection. 2016 Computational Neuroscience Meeting, South Korea
- 2016 Crook, S, R Gerkin, *K Dai, Creating better reduced neuron models. International Conference on Mathematical Neuroscience. Juan-les-Pins, France
- 2014 Crook, S, S Dietrich, NeuroML: Model Exchange for Computational Neuroscience, 2014 Collaborative Research in Computational Neuroscience (CRCNS) PI Meeting, Tempe, Arizona
- 2014 Crook, S, NeuroML: Model Exchange in Computational Neuroscience, 2014 COMBINE Meeting, UCLA, California
- 2014 Crook, S, S Dietrich, NeuroML Model Database, 2014 Computational Neuroscience Meeting, Quebec City, Canada
- 2013 Crook, S, NeuroML 2.0 and Open Source Brain, 2013 Society for Neuroscience Annual Meeting, San Diego, California
- 2013 *Luli, D, S Crook, A neuronal network model of Drosophila antennal lobe, Southeast Biomedical Engineering Conference 2013, Miami, Florida
- 2013 *Berger, S, S Baer, S Crook, A continuum approach to model neurites/dendrites with emerging subtrees, 2013 Computational Neuroscience Meeting, Paris, France
- 2012 *Berger, S, S Baer, S Crook, Estimation of electrical properties of dendrites with branches using a continuum modeling formulation, 2012 Society for Neuroscience Meeting, New Orleans, Louisiana
- 2012 Crook, S, S Dietrich, *C Zhang, CRCNS Data Sharing: NeuroML database for multiscale models in neuroscience, 2012 CRCNS PI Meeting, St. Louis, Missouri
- 2012 Cannon, R, P Gleeson, S Crook, A Silver, Reducing duplication and redundancy in declarative model specifications, 2012 Neuroinformatics Congress, Munich, Germany
- 2012 Gleeson P, E Piasini, S Crook, R Cannon, V Steuber, D Jaeger, S Solinas, E D'Angelo, RA Silver, The Open Source Brain Initiative: enabling collaborative modelling in computational neuroscience,

- Computational Neuroscience 2012, Atlanta, Georgia
- 2012 Cannon, R, P Gleeson, S Crook, RA Silver, A declarative model specification system allowing NeuroML to be extended with user-defined component types, Computational Neuroscience 2012, Atlanta, Georgia
- 2011 Gleeson P, S Crook, A Silver, R Cannon, Development of NeuroML version 2.0: Greater extensibility, support for abstract neuronal models and interaction with Systems Biology languages, Computational Neuroscience 2011, Stockholm, Sweden
- 2011 Smith A, M Cruz-Aponte, EC McKiernan, S Crook, M Herrera-Valdez, Differential contribution of A-type potassium currents in shaping neuronal responses to synaptic input, Computational Neuroscience 2011, Stockholm, Sweden
- 2010 Herrera-Valdez MA, SD Berger, C Duch, S Crook, Differential contribution of voltage-dependent potassium currents to neuronal excitability, Computational Neuroscience 2010, San Antonio, Texas

EDUCATIONAL ACTIVITIES

Postdoctoral Fellow Mentoring:

- 2025- Yuganthi Liyanage
- 2023-2025 Joan Ponce, Currently: Assistant Professor, Arizona State University
- 2021-2022 Vergil Haynes (with Yi Zhou), Currently: Scientist I, Allen Institute for Neural Dynamics
- 2014-2015 Sungwoo Ahn, Currently: Associate Professor, East Carolina University
- 2013-2014 Richard Gerkin (with Brian Smith), Currently: Science Lead, Osmo
- 2008-2010 Marco Herrera-Valdez (with Carlos Castillo-Chavez), Currently: Professor, School of Science, National Autonomous University of Mexico

PhD Students Advised:

- Current Kira Koyah, PhD Applied Mathematics
- Current Katherine Doxey, PhD Applied Mathematics
- Current Asia Kanwal, PhD Applied Mathematics
- 2025 Dominique Hughes, PhD Applied Mathematics, with Blair B Braden, *Characterizing the Effects of Age on Autistic Adults Using Network Analysis*
- 2025 Theophilus Kwofie, PhD Applied Mathematics, with Yun Kang, *Mathematical Modeling in Social Dynamics*
- 2025 Elliot Smith, PhD Interdisciplinary Neuroscience, *Oscillations in a Computational Subcircuit Model of Rodent Olfactory Bulb*
- 2022 Morteza Rouhani, PhD Applied Mathematics, with Jimmy Abbas, *Model Based Investigations of Peripheral Nerve Stimulation Using Longitudinal Intrafascicular Electrodes*
- 2020 Russell Jarvis, PhD Interdisciplinary Neuroscience, with Rick Gerkin, *Neuronal Deep Fakes: Data-driven Optimization of Reduced Neuronal Models*, Currently: Postdoctoral Researcher, International Centre for Neuromorphic Systems
- 2020 Vergil Haynes, PhD Applied Mathematics, *Understanding Cortical Neuron Dynamics through Simulation-based Applications of Machine Learning*, Currently: Scientist, Allen Institute for Neural Dynamics
- 2019 Justas Birgiolas, PhD Interdisciplinary Neuroscience, *Towards Brains in the Cloud: A Biophysically Realistic Computational Model of Olfactory Bulb*, Currently: Machine Learning Engineer, ACV Auctions
- 2014 Francisco Costela, PhD Interdisciplinary Neuroscience, with Susana Martinez-Conde at Barrow Neurological Institute, *The Significance of Microsaccades for Perception and Oculomotor Control*, Currently: Machine Learning Engineer, Sony Electronics
- 2014 Sandra Berger, PhD Interdisciplinary Neuroscience, *Analysis of Signal Processing and Excitability*

in Computational Models of an Identified Drosophila Motoneuron, Currently: not seeking employment

- 2013 Dori Luli, PhD Applied Mathematics for Life and Social Sciences, *A Neuronal Network Model of Drosophila Antennal Lobe*, Currently: Senior Associate - Modeling, Discover Financial Services
- 2012 David Tello, PhD Applied Mathematics for the Life and Social Sciences, *Modeling the Turnover Process for Dopaminergic Neurons*, Currently: Quantitative Analyst, Federal Home Loan Bank
- 2010 Mini Kurian, PhD Mathematics, *Mathematical Models of Motoneurons after Spinal Cord Injury*, Currently: not seeking employment
- 2007 Muhammad Dur-e-Ahmad, PhD Mathematics, with Zdzislaw Jackiewicz, *Structural Plasticity of Dendritic Spines: A Computational Study*, Currently: Senior Data Scientist, UnitedHealth Group

Master's Student Thesis Advisor:

- 2009 Pradeep Thiyyagura, MS Computational Biosciences, *Network Models of Insect Olfaction*, Currently: Computer Systems Specialist, Banner Good Samaritan PET Center, Banner Alzheimer's Institute
- 2007 Todd Huffman, MS Computational Biosciences, *Knife Edge Scanning Microscope: Development and Designs*, Currently: CEO 3Scan
- 2004 Carrie Diaz Eaton, MA Mathematics, University of Maine, *The Mathematical Properties and Underlying Structure of Fast Spiking Cell and Networked Cell Models*, Currently: Associate Professor of Mathematics, Center for Biodiversity, Bates College
- 2003 Weihong Qi, MS in Computer Science, University of Maine, *Tools for Neuroinformatic Data Exchange and Neuronal Simulation: An XML Application for Neuronal Morphology Data*, Currently: Researcher, Swiss Tropical Institute of the World Health Organization

PhD Graduate Student Committies:

- Current Ashley Harrison, PhD Applied Mathematics
- Current Allison Fuller, PhD Applied Mathematics
- Current Olivia Bruner, PhD Mathematics Education
- Current Ishtesa Khan, PhD Mathematics Education
- Current Derek Nguyen, PhD Biomedical Engineering
- Current Jason Guglielmo, PhD Mathematics Education
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| 2025 Nicholas Cortez, Applied Mathematics | 2025 Danyh Tolah, Applied Mathematics |
| 2025 Max Mercer, Applied Mathematics | 2025 Samantha Brozak, Applied Mathematics |
| 2023 Sulagna Sahu, Biomedical Engineering | 2023 Adel Alatawi, Applied Mathematics |
| 2023 Duane Harris, Applied Mathematics | 2022 Yanshuai Tu, Computer Science |
| 2021 Tin Phan, Applied Mathematics | 2021 Chao Zhang, Computer Science |
| 2020 Rahim Taghikhani, Applied Mathematics | 2019 Wendy Caldwell, Applied Mathematics |
| 2017 Javier Baez, Applied Mathematics | 2017 Christophe Faucon, Computer Science |
| 2015 Rebecca Everett, Applied Mathematics | 2014 Thomas Holeva, Mathematics |
| 2013 Jeremiah Jones, Applied Mathematics | 2012 Lydia Bilinsky, PhD Mathematics |
| 2012 Fernando Vonhoff, PhD Neuroscience | 2012 Shaojie Wang, PhD Mathematics |
| 2010 Michael McCamy, PhD Mathematics | 2009 Sarah Hewes, PhD Mathematics |
| 2008 Joe Graham, PhD Bioengineering | 2007 Tufail Malik, PhD Mathematics |
| 2007 Hao Wang, PhD Mathematics | |

Master's Student Research Advised:

- 2019 Likhita Chinnari, Computer Engineering

2019 Vishnu Datta Yanamandala, Computer Engineering
2019 Geeth Nischal Gottimukkala, Computer Engineering
2019 Vishal Reddy Eda, Computer Engineering

Undergraduate Student Research Advised:

2025- Michael Panigua and Alek Simpson, Undergraduate Research
2025- Ben Amtsfeld, Undergraduate Research
2025-2026 Vanya Murzin, Honors Thesis Advisor
2023-2024 Landon Mattingly-Dawson, Honors Thesis Advisor
2022-2023 Devon Horner, Computational Mathematics, Honors Thesis Committee
2020-2024 Eric Dudebout, Biochemistry, Honors Thesis Advisor, with Wade Van Horn
2021-2022 Jacqueline Dworacz, Mathematics, Honors Thesis Committee
2018-2019 Nicolas Schlichting, Computational Mathematics, Honors Thesis Advisor
2018-2019 Marcus Armstrong, ASU online, Biochemistry Undergraduate Research
2018-2019 Aymard Irakoze, Bioengineering Undergraduate Research
2018-2019 Alarmel Sira, Honors Thesis Committee
2018-2019 Tyler Mebane, Honors Thesis Advisor
2018-2019 Michael Furey, Honors Thesis Advisor
2018-2019 Sean Randall, Honors Thesis Advisor
2018-2019 David Ackerman, Computational Mathematics, Honors Thesis Advisor
2018-2019 Charly McCown, Computational Mathematics Undergraduate Research
2017-2018 Xavier Henes, Computational Mathematics Undergraduate Research
2016-2017 Sarah Brotman, Biology, Honors Thesis Committee
2016-2017 Lidia Csernak, Computational Mathematics, Honors Thesis Advisor
2015-2016 James Kyeh, Bioengineering, Honors Thesis Committee
2014-2015 Catalina Flores, Biology, Honors Thesis Committee
2014-2015 Kara Schaffer, Biology, Honors Thesis Committee
2013-2014 Giresse Tchegho, Chemical Engineering Undergraduate Research
2012-2014 Jason Young, Mathematics Undergraduate Research
2010-2011 April Chiu, Honors Thesis Advisor, Computational Mathematics
2010 Miles Manning and April Chiu, CSUMS Summer Project
2010-2011 Sara Selitsky, Biology Undergraduate Research
2006-2008 Nicholas Tatonetti, UBM and SOLUR Programs
2007 Pamela Reitsma, Odalys Colon, Irina Kareva, MTBI Summer Program
2006-2007 Adriana Kuiper, UBM Program, Mathematics
2005-2006 Gina Ngo, UBM Program (with Ron Rutowski), Biology
2003-2004 Jason Sewell, Honors Thesis, University of Maine
2002-2003 Carrie Diaz Eaton, Honors Thesis, University of Maine

SERVICE

Select Editorial Service:

Associate Editor: Mathematical Biosciences and Engineering, Frontiers in Neuroinformatics

Ad hoc Reviews: Journal of Computational Neuroscience, Journal of Neuroscience, Network, Neurocomputing, Journal of Theoretical Biology, Journal of Neurophysiology, BioSystems, Cognitive Neurodynamics, IEEE Transactions on Biomedical Engineering, Neuroinformatics, Physical Review E, Neural Computation, Biophysical Journal, SIAM Applied Dynamical Systems, PLoS Computational Biology, Mathematical Medicine and Biology

Select Grant Reviews:

NIH BRAIN Initiative Study Sections: Data Archives, Integration, and Standards 2019, Data Analysis 2020, Data Analysis (chair) 2021, Data Archives, Integration, and Standards (chair) 2022, Research Education: Short Courses 2022, 2023, 2024

NIH NRSA Individual Postdoctoral Fellowships 2019, 2020

NIH Study Section Member: Neuro-, Ophthalmic and Imaging Technology July 1, 2012-June 30, 2015

NIH Study Sections (Ad hoc Member): Sensorimotor Integration 2005, 2006, 2020; Neurotechnology 2007, 2008, 2010; MABS 2018

Joint NSF/NIH Review Panel for Collaborative Research in Computational Neuroscience (CRCNS) 2002, 2004, 2008, 2009

AWM-NSF Mentoring Travel Grants 2011-2013

Other Regional, National, and International Service:

2024-2025 National Institute for Theory and Mathematics in Biology (NITMB) MathBio Convergence Conference, Organizing Committee

2025 Organizer, NEURON Simulator International Training Week at Arizona State University

2023-2028 Society for Industrial and Applied Mathematics (SIAM) Committee on Science Policy

2021- Scientific Steering Group, NIH BRAIN Initiative Grant Advancing bio-realistic modeling via the Brain Modeling Toolkit and SONATA Data Format

2020-2025 International BRAIN Initiative: Data Standards and Sharing Working Group, Chair: Training Task Force

2019- NeuroML Scientific Committee

2019-2025 Steering Committee, NIH SPARC (Stimulating Peripheral Activity to Relieve Conditions) Data Resource Center

2016-2019 Vice President, Organization for Computational Neuroscience (Elected International)

2017 Advisory Role, NICT-NSF Collaborative Workshop on Computational Neuroscience, Osaka, Japan

2016-2017 Program Committee, 2017 International Neuroinformatics Coordinating Facility (INCF) Annual Meeting, Kuala Lumpur

2016-2017 Scientific Advisory Committee, 2017 Society for Mathematical Biology Meeting in Salt Lake City

2014-2016 Editorial Board (elected), NeuroML Project

2013-2015 Board of Directors, Organization for Computational Neuroscience

2015 Organizer (with Brian Smith), Large-scale Modeling of the Olfactory System, NIMBioS Funded Workshop, University of Tennessee, Knoxville, Tennessee

2014 Organizer (with Brian Smith), 2014 Collaborative Research in Computational Neuroscience PI Meeting, Tempe, Arizona

2013 Program Committee Member, 29th Annual Southern Biomedical Engineering Conference, Miami, Florida

2011-2013 Association for Women in Mathematics Mentoring Grant Review Committee (2013 Chair)

2008-2011 Member, Oversight Committee for Description Standards in Neural Network Modeling, International Neuroinformatics Coordinating Facility

March 2007 Invited Participant, NSF and Santa Fe Institute Workshop, Brain Science at the Interface of Biological, Physical and Mathematical Sciences, Computer Science and Engineering: Analysis of New Opportunities

2005-2008 Program Committee, Organization for Computational Neuroscience (Annual Computational Neuroscience International Meeting)

2003-2005 Board of Directors, Organization for Computational Neuroscience

Professional Society Membership:

Organization for Computational Neuroscience, Society for Neuroscience, Society for Mathematical Biology, Society for Industrial and Applied Mathematics, Association for Women in Mathematics, American Association for the Advancement of Science, International Neuroinformatics Coordinating Facility