

Ghanim Ullah

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Education

Ph.D. Computational Biophysics: Department of Physics and Astronomy, Quantitative Biology Institute, Ohio University, Advisor: Peter Jung, Aug 2006.

Thesis title: Computational modeling of calcium signaling from the nanoscale to multicellular systems.

M.Sc. Physics: University of Peshawar, Pakistan, 2000.

B.Sc. Physics and Mathematics: University of Peshawar, Pakistan, 1998.

Professional Experience

Assistant Professor: Department of Physics, University of South Florida, Aug 2013 – Present.

Postdoctoral Research Associate: Theoretical Biology and Biophysics, Los Alamos National Laboratory, Mentor: John E Pearson, Jul 2010 – June 2013.

Early Career Visitor: Mathematical Biosciences Institute, the Ohio State University, Sep 2012 – May 2013.

Postdoctoral Research Associate: Center for Neural Engineering, Department of Engineering Science and Mechanics, The Pennsylvania State University, Mentor: Steven J Schiff, Sep 2006 – Jun 2010.

Lecturer: Department of Physics, University of Peshawar, Pakistan, Feb 2001 – Jun 2001.

Lecturer: Warsak Model College, Peshawar, Pakistan, Aug 2000 – Feb 2001.

Publications

1. Wei Y, **Ullah G**, Ingram J, and Schiff SJ, Oxygen and seizure dynamics: II. Computational modeling, in review.
2. Wei Y, Wert SV, **Ullah G**, Schiff SJ, Unification of neuronal spikes, seizures, and spreading depression, in review.
3. Bruno W, **Ullah G**, Mak DOD, and Pearson JE, Automated maximum likelihood separation of signal from baseline in noisy quantal data, *Biophysical Journal*, 105 (2013) 68.
4. Vais H, Foskett KJ, **Ullah G**, Pearson JE, and Mak DOD, Permeant calcium ion feedback regulation of single inositol 1,4,5-trisphosphate receptor channel gating, *Journal of General Physiology*, 140 (2012) 697.
5. **Ullah G**, Mak DOD, and Pearson JE, A data-driven model of a modal gated ion channel: the inositol 1,4,5-trisphosphate receptor in insect Sf9 cell, *Journal of General Physiology*, 140 (2012) 159.
6. **Ullah G**, Bruno W, and Pearson JE, Simplification of reversible Markov chains by removal of states with low equilibrium occupancy, *Journal of Theoretical Biology*, 311 (2012) 117.
7. **Ullah G**, Parker I, Mak DOD, and Pearson JE, Multi-scale data-driven modeling and observation of calcium puffs, *Cell Calcium*, 52, (2012) 152.
8. Ahmad F, **Ullah G**, and Kim SH, A neighborhood method for statistical analysis of fMRI data, *Open Journal of Biophysics*, 2(1) (2012) 15.

9. **Ullah G** and Schiff SJ, Assimilating seizure dynamics, PLoS Computational Biology, 6 (2010) e1000776.
10. Sawaminathan D, **Ullah G**, and Jung P, A simple sequential-binding model for calcium puffs, Chaos, 19 (2009) 037109.
11. **Ullah G** and Schiff SJ, Tracking and control of neuronal Hodgkin-Huxley dynamics, Physical Review E, 79 (2009) 040901.
12. **Ullah G**, Cressman JR, Barreto E, and Schiff SJ, The influence of sodium and potassium dynamics on excitability, seizures, and the stability of persistent states: II. Network and glial dynamics, Journal of Computational Neuroscience, 26 (2009) 171.
13. Cressman JR, **Ullah G**, Ziburkus J, Barreto E, and Schiff SJ, The influence of sodium and potassium dynamics on excitability, seizures, and the stability of persistent states: I. Single neuron dynamics, Journal of Computational Neuroscience, 26 (2009) 159.
14. **Ullah G**, Jung P, and Machaca K, Modeling calcium signaling differentiation during oocyte maturation, Cell Calcium, 42 (2007) 556.
15. **Ullah G** and Peter Jung, Modeling the statistics of elementary calcium release events Biophysical Journal, 90 (2006) 3485.
16. **Ullah G**, Jung P, and Cornell-Bell AH, Anti-phase calcium oscillations in astrocytes via inositol 1,4,5-trisphosphate regeneration, Cell Calcium, 39 (2006) 197.
17. Jung P, Neiman AB, Afghan MKN, Nadkarni S, **Ullah G**, Thermal activation by power-limited colored noise, New Journal of Physics, 7 (2005) 17.

Invited Review

Ullah G and Schiff SJ, Models of epilepsy, Scholarpedia, 4(7) (2009) 1409.

Peer Reviewed Conference Proceedings

1. Wei Y, **Ullah G**, Ingram J, and Schiff SJ, Oxygen dynamics during *in vitro* seizures, Computational Neuroscience Meeting, in BMC Neuroscience, 13 (s1) (2012) O20.
2. Wei Y, **Ullah G**, Parekh R, Ziburkus J, and Schiff SJ, Kalman filter tracking of intracellular neuronal voltage and current, 50th IEEE Conference on Decision and Control and European Control Conference, (2011) 12-15.
3. **Ullah G** and Schiff SJ, Tracking neuronal dynamics during seizures, Computational Neuroscience Meeting, in BMC Neuroscience, 11 (s1) (2010) O9.
4. **Ullah G** and Schiff SJ, Assimilating and controlling seizure dynamics, American Epilepsy Society Meeting, in Epilepsia, 50 (s11) (2009) 395.
5. **Ullah G**, Cressman JR, and Schiff SJ, Modeling the cellular interaction mechanism responsible for seizures, American Epilepsy Society Meeting, in Epilepsia, 49 (s7) (2008) 355.
6. **Ullah G**, Cressman JR, and Schiff SJ, Modeling the interplay between interneuron and pyramidal cell during seizures, Computational Neuroscience Meeting, in BMC Neuroscience, 9 (2008) P145.
7. Cressman JR, **Ullah G**, Ziburkus J, Barreto E, and Schiff SJ, Ion concentration dynamics: mechanisms for bursting and seizing, Computational Neuroscience Meeting, in BMC Neuroscience 9 (2008), O9.
8. **Ullah G**, Cressman JR, Barreto E, and Schiff SJ, The role of glia in seizures, Computational Neuroscience Meeting, in BMC Neuroscience, 8 (2007) P28.

9. Cressman JR, **Ullah G**, Ziburkus J, Barreto E, and Schiff SJ, Slow potassium dynamics and seizure evolution, Computational Neuroscience Meeting, in BMC Neuroscience, 8 (2007) P80.

Other Activities

Reviewer: Cell Calcium, Physical Biology, Nanoscale Research Letters, Journal of Cell Biology, International Journal of Neuroscience, Journal of Neural Engineering, Concepts in Magnetic Resonance, Journal of Biological Physics, and Epilepsy Research.

Invited Talks

Modeling calcium signaling from single channel release events to intercellular waves.
Florida Atlantic University, March 2010.

Tracking and controlling neuronal dynamics during seizures
Ball State University, April 2009.

Calcium signaling differentiation in the maturing xenopus oocytes: A modeling approach.
Joint SIAM-SMB conference on the Life Sciences, Raleigh, July 2006.

Computational modeling of calcium signaling from the nanoscale to multicellular systems.
George Mason University, May 2006.

Anti-phase calcium oscillations in astrocytes via inositol 1,4,5-trisphosphate regeneration.
Applied and Computational Mathematics Department, Ohio University, November 2005.