Daniel M. Maruyama

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Education

PhD Physics, University of Michigan, Ann Arbor, MI   Expected May 2015
Thesis Concentration: Systems Neuroscience

BA Mathematics and Physics, University of California, Berkeley, CA   Dec 2008
Thesis Concentration: Cosmology

Research Experience

Graduate Student Researcher, Zochowski Lab   May 2010 - Present
Determined the functional connectivity between neurons in order to quantify the stability and evolution of neuronal networks.
Technical accomplishments
- Enhanced signal detection capabilities by an order of magnitude
- Improved core analysis program leading to a ~10^4 speed up
- Automated analysis increased data throughput capabilities
- Implemented new visualization programs to handle escalated data output
Impact
- Increased data processing provided access to studying network dynamics
- Demonstrated that learning can be measured via network stability

Simulated the effect of astrocytes on neuronal networks, which led to the creation of the first astrocytic network model capable of matching biological firing properties.

Undergraduate Researcher, Smoot Lab   October 2006-May 2008, Sept 2008-July 2009
Worked under Nobel laureate George Smoot, in searches for cosmic strings and dark matter. Led to the first limits on string existence using gravitational lensing.
- Simulated the detection signature for cosmic strings
- Calculated galaxy shear to improve gravitational lensing dark matter detection

Internships

Summer Intern, 3M, 3M Center Maplewood MN   Jun-Aug 2008
Team project in the Optics and Nanotechnology R&D group aimed at developing ultra sensitive bacteria detectors utilizing surface plasmon resonance on gold nanostructures. Set up lab optics, measured intensities and spectra, analyzed performance, tested bacteria.

Summer Intern, Algae Fuel, Walnut Creek CA, Unpaid internship   May-July 2009
Built a commercial algae bioreactor and researched methods of implementing small scale bio-char as a means of limiting CO_2 emissions

Additional Information

Programming experience: Matlab, Python, R, C++, IDL, Unix
Publications, professional presentations, and teaching experience: available upon request.
Interests: Golf, Hiking in Glacier National Park, Minnesotan Music, Minnesota, The physics of Santa - http://tinyurl.com/dxonfc6