Noah Olsman

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Education

University of Southern California 2008-2012
B.S. Electrical Engineering, Minor in Mathematics
Overall GPA: 3.8. Major GPA: 3.9 *Magna Cum Laude*

California Institute of Technology 2013-Present
Ph.D. Control and Dynamical Systems, Advised by Lea Goentoro and John Doyle
Overall GPA: 3.9

Past Employment

Post-Baccalaureate Resercher, Yale University June 2012–2013
Department of Moelcular, Cellular, and Developmental Biology
Adviser: Thierry Emonet

Research Interests

Control Theory, Cellular Signaling, Systems Biology, Dynamical Systems, Social Learning, Consensus Problems

Research Papers

[1] Experimental and Computational Analysis of a Large Protein Network That Controls Fat Storage Reveals the Design Principles of a Signaling Network. *PLoS Computational Biology 2015.* Al-Anzi, B., Arpp, P., Gerges, S., Ormerod, C., **Olsman, N.**, Zinn, K.

Presentations

[1] Allosteric Proteins as Logarithmic Sensors *Winter q-bio Meeting 2015* **Olsman, N.**, Goentoro, L.

Select Coursework

Modern Control Theory, Systems Biology, Gene Regulatory Systems, Markov Chains, Stochastic Processes, Convex Optimization, Machine Learning and Data Mining, Statistical Inference

Research Experience

Bayesian Social Learning — Summer 2015– Present

I am working with Professor Omer Tamuz studying a Bayesian consesus problems. Specifically, we are focusing on how a network of agents can use repeated observations of each other to compute population-level statistics in an efficient way. In addition, we study how privacy can be designed in a network, such that agents can efficiently compute desired statistics without being able to accurately infer the private states of distant agents.

Design Principles in Biological Systems — Summer 2014 – Present

I currently work with Professors Lea Goentoro and John Doyle exploring the mechanisms by which cells sense and make decision about their environment. My goal is to analyze mathematical models of protein dynamics to understand how the structure of molecules gives rise to functional behavior in biological systems. I am particularly interested in understanding what design principles underly network design and how we can use tools from robust control theory to gain insight into the universal constraints on what functions can be evolved.

Bacterial Chemotaxis — Summer 2012–2013

Developing linear response model of chemotaxis in *Escherichia coli* with Professor Thierry Emonet at Yale University. We develop simplified mathematical models and simulations to gain insight into the processes by which bacteria direct motion towards and away from chemical sources in their environment. We hope to gain a deeper understanding of the role phenotypic variability plays in determining cell fitness when cells are faced with an unknown environment. This research is supported by the Sigma Xi Research Foundation Grant-In-Aid of Research.

Combinatorics and Number Theory — Spring 2009–2012

Working with Professor Solomon Golomb at USC under both the Rose Hills and Viterbi Merit Fellowships on open problems in pure and applied mathematics, pertaining to topics such as the generation of Costas arrays and bounds for the Prime k-Tuple Conjecture.

Self-Organizing Systems Laboratory — Summer 2010

Worked with Professor Radhika Nagpal at Harvard University simulating robotic swarm systems in the Research Experienece for Undergraduates (REU) program. The goal of the research was to generate distributed algorithms to allow robotic bees to pollinate in an agricultural environment. The algorithms utilize Levy walks and Markov models.

Honors and Awards

USC Viterbi Merit Research Award	Fall 2009–2012
Harvard Summer Research Experience for Undergraduates	Summer 2010
USC Goldwater Scholarship Nomination	2011
The Rose Hill Foundation Undergraduate Research Fellowship	Summer 2009, Summer 2011
Jerome Linn Endowed Scholarship in Electrical Engineering	Fall 2010
Rose Hills Foundation Scholarship	2011–2012
Sigma Xi Grant-In-Aid of Research	2012
Benjamin M. Rosen Fellowship	2013