

Elizabeth Bodine-Baron

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Education

- California Institute of Technology Pasadena, CA** Fall 2007 – Present
Ph.D. Electrical Engineering expected June 2012
M.S. Electrical Engineering, *GPA 3.70/4.00* June 2009
- University of Texas Austin, TX** August 2002 – December 2006
B.S. Electrical Engineering, *GPA 4.00/4.00*
B.A. Plan II Honors, *GPA 4.00/4.00*

Experience

- Caltech Research (advisors: Adam Wierman and Babak Hassibi)** Sept 2007 – Present
Research in the areas of complex networks, graph theory, communications, and distributed algorithms. Studying the structure of social networks, such as heavy-tailed degree distributions, small diameter, and high clustering, in order to exploit these unique structural properties to gain new understanding of, and perhaps solve, previously intractable problems, such as matching markets with peer effects and the spread of information and epidemics on complex dynamic networks.
- RAND Corporation, Santa Monica, CA** Summer 2011
Summer Associate, RAND Health and Project Air Force (PAF)
RAND Health work with Neeraj Sood, Sarah Nowak, and Raffaele Vardavas: Created game theoretical model of vaccination decisions and epidemics with conforming and non-conforming peer effects. Examined effect on various health care policies, such as government subsidies of vaccination costs. Research culminated in two papers and a presentation. Extensions to research ongoing at Caltech.
PAF work with Brien Alkire and Sherrill Lingel: Researched computer security issues regarding hiding data in plain sight, specifically with regard to limitations of sending encrypted streaming video and audio in the open, as well as short report on DNA cryptography.
- Jet Propulsion Laboratory (JPL), Pasadena, CA** Jan 2007 – Present
Engineer, Advanced Signal Processing Projects Group (332E)
Support Working Group to develop iNET Communications Standard for DoD. Developing TDMA protocol simulation using C and UNIX sockets to identify problem areas of standard and suggest solutions.
Researched software defined radio architecture, network coding and LT codes, and data link layer protocols for low-power Mars micro transceiver
- MIT Lincoln Laboratory, Boston, MA** Summer 2005, 2006
Engineering Intern (Group 65: Advanced Networks and Applications)
Created Joint Tactical Radio System (JTRS) Gateway Emulation tool using network programming and traffic simulation and analysis tools
Researched traditional policy-based network management for the global information grid and additional adaptations for the airborne network, including clustering and red/black boundary solutions
- WSN to Monitor Social Interactions, Undergraduate Thesis** 2005-2006
Supervising Professors: Bill Bard, Sanjay Shakkottai
Implemented a mobile wireless sensor network using basic gossip protocols and Intel MICAz motes to perform social network research
- IBM Tivoli, Austin, TX** Summer 2004
Engineering and Software Intern, Advanced Interoperative Solutions Group
Created and presented SuSE Linux & IBM Tivoli Proof of Concept Demonstration at LinuxWorld San Francisco. Researched and presented Cluster Monitoring project

Publications

- Bodine-Baron, E., Nowak, S., Vardavas, R., Sood, N. "Conforming and Non-conforming Peer Effects in Vaccination Decisions," *working paper*.
- Bodine-Baron, E., Hassibi, B., Wierman, A. "Characterizing externalities and stability in matching markets via social networks," *working paper*.
- Bodine-Baron, E., Bose, S., Hassibi, B., Wierman, A. "Epidemic cost in complex networks," *working paper*.
- Bodine-Baron, E., Lee, C., Chong, A., Hassibi, B., Wierman, A. "Peer effects and Stability in Matching Markets," *Proceedings of the 4th International Symposium on Game Theory (SAGT) 2011*. October 2011.
- Bodine-Baron, E., Bose, S., Hassibi, B., Wierman, A. "Minimizing the social cost of epidemics," *Proceedings of GameNets 2011*, April 2011.
- Bodine-Baron, E., Hassibi, B., Wierman, A. "Distance-Dependent Kronecker Graphs for Modeling Social Networks," *IEEE Journal of Selected Topics in Signal Processing*, vol.4, no.4, pp.718-731, Aug. 2010.
- Thai, D., Bodine-Baron, E., Hassibi, B. "A symmetric adaptive algorithm for speeding-up consensus," *2010 IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP)*, pp.2686-2689, 14-19 March 2010.
- Bodine, E., Hassibi, B., Wierman, A. "Generalizing Kronecker graphs in order to model searchable networks," *Allerton 2009. 47th Annual Allerton Conference on Communication, Control, and Computing*, pp.194-201, Sept. 30 2009-Oct. 2 2009.
- Bodine, E., Cheng, M. "Characterization of Luby Transform Codes with Small Message Size for Low-Latency Decoding," *ICC '08. IEEE International Conference on Communications*, pp.1195-1199, 19-23 May 2008.

Presentations

- "Peer Effects and Stability in Matching Markets: The advantage of social network structure," *Cornell Information, Systems, and Networks Seminar*, November 2011.
- "Peer Effects and Stability in Matching Markets," *SAGT 2011*, Amalfi, Italy, October 2011.
- "Using social networks to characterize peer effects and instability in matching markets," *Sunbelt INSNA Conference*, St. Petersburg, FL, Feb 2011.
- "Using social networks to characterize peer effects and instability in matching markets," *SISL/Yahoo! SISHOO Workshop*, Huntington Beach, CA, Dec 2010.
- "Distance-Dependent Kronecker Graphs for Modeling Social Networks," *IEEE Themes 2010 Workshop*, Dallas, TX, March 2010.
- "Generalizing Kronecker Graphs in order to Model Searchable Networks," *SISL/Yahoo! SISHOO Workshop*, Huntington Beach, CA, Dec 2009.
- "Generalizing Kronecker graphs in order to model searchable networks," *Allerton 2009*, Allerton, IL, October 2009.
- "Characterization of Luby Transform Codes with Small Message Size for Low-Latency Decoding," *ICC 08*, Beijing, China, May 2008.

Coursework

Two Sided Matching; Stochastic Processes and Modeling; Networking; Information Theory, Digital Signal Processing; Communication Theory; Stochastic and Adaptive Signal Processing; Performance Modeling; Advanced Performance Modeling; Learning Systems; Brains, Minds and Society; Distributed Computation Laboratory

Honors and Affiliations

- Caltech Atwood Fellowship 2010 - 2011
- NDSEG Fellowship 2007 - 2010
- Mars Micro transceiver JPL Team Award 2008
- Phi Beta Kappa 2005
- UT College of Engineering Outstanding Scholar/Leader Runner-up 2006
- Engineering Honors Program 2002 - 2006
- Raytheon, SWE, Engineering Honors Scholarships 2002 - 2006
- IEEE 2002 - Present
- Society of Women Engineers (SWE) 2002 - Present

Skills

Matlab, Mathematica, R simulation and programming
UCINET and NetDraw Social Network Analysis tools
C, C++, nesC (TinyOS), UNIX Socket Programming, basic shell scripting
HTML, ASP
IXIA VoIP and Traffic Simulation, Cisco and Linux Networking
LaTeX, Microsoft Access, Word, Excel, PowerPoint
Strong leadership and teamwork skills