

Joshua Brandoff

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SUMMARY

Systems innovator trained in using biologically-inspired computational and mathematical modeling techniques to create adaptive software. Currently managing technology infrastructure and development of interactive applications for the Museum of Mathematics.

EDUCATION

Binghamton University, State University of New York
**M.S., Systems Science, Biosystems
Certificate, Evolutionary Studies**
Research Focus: Genetic Swarm Intelligence Algorithms
Cumulative GPA: 3.89
Binghamton, NY
8/2008—12/2009

Massachusetts Institute of Technology, Sloan School of Management
Certificate, Product Design, Development, and Management
Cambridge, MA
7/2009

Binghamton University, State University of New York
B.S., Bioengineering, Magna Cum Laude, All-University Honors
Cumulative GPA: 3.72 Major GPA: 3.78
Binghamton, NY
8/2004—5/2008

EMPLOYMENT

Mathematical Programmer and IT Specialist, Museum of Mathematics
Direct and develop Museum technology infrastructure, develop websites and interactive applications, coordinate related outreach programs and help prepare the Museum for public launch in 2012.
New York, NY
6/2010—Present

Teaching/Project Aide, Institute for Child Development
Provide intensive instruction and care to children with autism and assist with systems administration and web development projects.
Vestal, NY
3/2010—4/2010

Mathematics Tutor, Self-Employed
Provide professional tutoring and educational guidance in Calculus II and related engineering math and science courses.
Vestal, NY
2/2010—4/2010

Teaching Assistant, Binghamton University
Instructed and mentored engineering students in the modeling and simulation of social, biological and artificial complex systems displaying collective, evolutionary, self-organizing behavior.
Binghamton, NY
8/2008—12/2009

Research Assistant, Binghamton University
Created anti-terrorism simulation, urban growth and wealth distribution models with groups at New England Complex Systems Institute Summer School at MIT and developed swarm robot communication framework.
Cambridge, MA
Binghamton, NY
6/2008—8/2008

SKILLS

Applications:

Dreamweaver, Flash, Photoshop, Fireworks, Word, PowerPoint, Excel,

Systems Hardware/Software Administration:

Apache, cPanel/WHM, CiviCRM, Bedework Calendar, Drupal, WordPress

Development:

Python, Java, C/C++, PHP, MySQL, ActionScript (AS3), X/HTML, XML, CSS, Mathematica

Modeling:

Agent-based, statistical, stochastic, network, differential equations, cellular automata, genetic algorithms, neural networks, database

Platforms:

Linux (CentOS, Ubuntu), Mac OS X, Windows (XP, Vista, 7)

LEADERSHIP	<p>CEO/CTO of EvoThena, Adaptive Software Start-Up Company Led senior design start-up company in developing business plan/patent application around prototyped adaptive software which used self-organizing clustering technology to recommend journal and magazine articles to educational professionals. Licensed text-to-speech technology allowed users to listen to selected article while viewing relevant images from articles through interactive interface on laptop or hand-held device.</p>	Binghamton, NY 8/2007—5/2008
	<p>Member of Catalysts for Intellectual Capital Development Think Tank Consulted with local, county and state government officials as well as executive boards from Lockheed Martin, Lourdes Hospital and other companies to develop plans to support upstate New York economy.</p>	Binghamton, NY 1/2008—5/2008
	<p>President/Webmaster, BU AIDS Prevention Awareness & Care Group Organized volunteer training sessions for 25 students, assisted with Binghamton University's first mass HIV-testing event, participated in several fundraising events and developed of new group logo and website.</p>	Binghamton, NY Webmaster 9/2006—5/2008 President 9/2007—12/2007
PROJECTS	<p>Product Design and Development for "Taxi Cab Organizer" Worked with product managers to design and prototype mobile, personal organizer for taxi cab driver based on interviews, research and IDEO design process during "Product Design, Development and Management" course at MIT Sloan School of Management.</p>	Cambridge, MA 7/2009
	<p>Environmental Monitoring through Artificial Quorum Sensing Developed physical simulation of swarm robotic sensor network which used collective intelligence to detect water pollution and notify human engineers in real-time.</p>	Binghamton, NY 3/2009—5/2009
	<p>New England Complex Systems Institute Summer Mini-Projects Week 1: Worked with senior scientist of UK Defence Science and Technology Laboratories (DSTL) to develop cellular automata model exploring growth of terrorist cells as function of local social sentiment. Week 2: Modeled spatial and functional growth of cities by representing them as network of urban artifacts (roads, stores, housing) that preferentially attach to existing artifacts based on selection algorithm. Week 3: Explored alternative to static Gini coefficient (measurement of inequality) that takes into account dynamic nature of human societies,</p>	Cambridge, MA 7/2008
	<p>Civic Planning Optimization Using Genetic Algorithms Created and presented program to Binghamton city government that allows civic planners to optimize distribution of directional signs in local park based on budget and researched foot-traffic patterns along trails.</p>	Binghamton, NY 1/2008—5/2008
	<p>Agent-Based Modeling of Sexual Behavior in Social Environment Used agent-based modeling to simulate effects of varying testosterone levels of heterosexual dating behavior.</p>	Binghamton, NY 3/2008—5/2008
	<p>Robotic Maze Navigation Using Artificial Neural Networks Combined action-potential ion transfer modeling and nonlinear learning rules (including Oja and Hebbian) to allow small mobile robot to learn how to navigate through small maze without collisions and avoid dead ends.</p>	Binghamton, NY 9/2007—12/2007
	<p>Computer-Assisted Breast Cancer Diagnosis Used genetic algorithm-trained neural network to diagnose breast cancer with greater than 90% accuracy based on abridged biopsy data set courtesy of Moffitt Cancer Center & Research Institute.</p>	Binghamton, NY 1/2007—5/2007

Experimental Statistical Analysis of Microbial Growth	Developed experiment to determine proliferation differences between two strains of yeast and statistically analyzed results using R.	Binghamton, NY 10/2006—12/2006
Cardiovascular Manipulation Via Soleus and Plantar Stimulation	Developed and administered clinical study to inform new prototypes of commercially-available Juvent 1000 Dynamic Motion Therapy Device. Prototypes used micromechanical stimulation of plantar nerves on the foot to influence blood pressure and improve cardiovascular health.	Binghamton, NY 1/2006—5/2007
Undergraduate Social Networking and Advising Utility	Created social networking tool that allows students to visualize academic social network, compare its characteristics to academic models and find best peer tutor in network based on degrees of separation and GPA.	Binghamton, NY 2/2006—5/2006
Simulation of Communication Ability in Noisy Environments	Created simulation that explores how spoken phrases change structure over time when communicated in environments of varying ambient noise. Patterns analyzed to suggest ways of passing messages more accurately.	Binghamton, NY 9/2005—12/2005
Community Fundraising and Volunteer Events	Helped raise over \$700 for charity through organization of "hammer strength" carnival game and student variety show.	Binghamton, NY 11/2005; 4/2006

RESEARCH GRANTS

Developing Humanitarian Swarm Robotics Applications Through "Bottom-Up" Pedagogy
2009 Evolutionary Studies Small Grant Program, Binghamton University (\$1700)

PUBLICATIONS

Josh Brandoff, Genetic Stigmergy: Framework and Applications, Master's Thesis, Department of Systems Science, Binghamton University, December 2009. PQDT Open.

Josh Brandoff and Hiroki Sayama, Cultural transmission in robotic swarms through RFID cards, U.S. Patent Application, No. 61/160897.

Josh Brandoff and Hiroki Sayama, Cultural transmission in robotic swarms through RFID cards, Proceedings of the Second IEEE Symposium on Artificial Life (IEEE-CI-ALife '09), Nashville, TN, 2009, IEEE, pp. 171-178.

Josh Brandoff, Using Genetic Algorithms to Optimize Sign Allocation Along Otsiningo Park Greenway Trails, Catalysts for Intellectual Capital Leadership Institute, Binghamton, NY 2008

Josh Brandoff, Is there a way to make cyborgs look human?, Ask-a-Scientist: InsideBU, Press & Sun -Bulletin, Star-Gazette, March 18, 2009.

Josh Brandoff, Do you think our government or world will ever be run by cybernetic organisms (robots)?, Ask-a-Scientist: InsideBU, Press & Sun-Bulletin, November 27, 2008.

Jennifer Flexman, P. Yang, Josh Brandoff and S. Languitton. Student reflections on the 2007 Annual Conference of the EMBS in Lyon [Student's Corner] Engineering in Medicine and Biology Magazine, IEEE, Volume 27, Issue 1, Jan.-Feb. 2008 Page(s):14 – 83

MEMBERSHIPS

IEEE Education Society, Computational Intelligence Society (CIS), Robotics and Automation Society (RAS), Systems, Man and Cybernetics Society (SMCS)
New England Complex Systems Institute (NECSI)
Tau Beta Pi Engineering Honor Society (TBP)

HOBBIES

Piano, Saxophone,
Flute, Singing,
Snowboarding,
Web/graphic design