

# Ephrat Bitton

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## Contact Information

2040 Hearst Ave Apt D  
Berkeley, CA 94709

*Voice:* (510) 717-6956  
*E-mail:* ebitton@berkeley.edu  
*Website:* www.ocf.berkeley.edu/~ebitton

## Research Interests

Collaborative filtering, reputation systems, game theory, graph theory, network flows, mathematical modeling, social entrepreneurship

## Education

### Ph.D., UC Berkeley

**August 2006 - present**

Industrial Engineering & Operations Research  
Minors in Algorithms, Machine Learning  
Designated Emphasis in New Media  
Advisor: Professor Ken Goldberg

### Master of Science, UC Berkeley

Computer Science  
Industrial Engineering & Operations Research

**Expected December 2010**  
**May 2008**

### Bachelor of Science, UC Berkeley

**May 2006**

Industrial Engineering & Operations Research  
Minor in Computer Science

## Research Experience

### *Research Assistant*

**August 2005 - present**

UC Berkeley Automation Sciences Lab

Currently working on the design of a collaborative filtering model for comments in an online discussion forum that is both efficient and resistant to manipulation. The system combines a spatial model of user behavior with efficient graph-theoretical techniques to personalize and improve user experience. Joint project with the US Department of State. Url: <http://state.gov/opinionspace>

Advisor: Professor Ken Goldberg

### *Summer Intern, Visiting Researcher*

**June 2006 - April 2007**

Palo Alto Research Center, Intelligent Systems Lab

Worked on improvements to bounded suboptimal heuristic search by learning an inadmissible heuristic on-line.

Advisor: Dr. Wheeler Ruml

### *Mathematical Contest in Modeling*

**August 2003 - February 2006**

Worked in a team of three to train for and compete in a rigorous international contest in mathematical modeling. Built, simulated and tested a large number of mathematical models to represent open-ended real-world problems. Meticulously studied and refined techniques to maximize teamwork within a small group and communicate technical information effectively.

Advisors: Professors Craig Evans and Christos Papadimitriou

### *Astronomy Research*

**January - August 2002**

NASA Ames Research Center, Mountain View Ca

Processed and analyzed spectra of the Orion nebula observed from the Hubble Space Telescope and the Infrared Space Observatory. Discovered and measured cosmic evolution based on the presence of chemical elements and their abundances.

Advisor: Dr. Robert H. Rubin, Space Science Division

## Teaching Experience

*Graduate Student Instructor* **Fall 2006**  
Industrial and Commercial Data Systems  
Taught a class of 60 undergraduates twice a week on the theory of data system design. Other duties included holding office hours, building and maintaining the course website, giving occasional lectures in class, and grading labs and exams.  
Advisor: Professor Ken Goldberg

*Course Coordinator* **Fall 2005**  
Introduction to Mathematical Modeling  
Taught a self-initiated undergraduate course that introduces students to methods and techniques of applied mathematics research. The course is aimed at preparing students for successful competition in the Mathematical Contest in Modeling.  
Website: [www.ocf.berkeley.edu/~ebitton/math198](http://www.ocf.berkeley.edu/~ebitton/math198)  
Advisor: Professor Bernd Sturmfels

*Teaching Assistant* **Spring 2005**  
Research Seminar in Mathematical Modeling  
Assisted in teaching an introductory course on mathematical modeling. Delivered lectures and maintained the course website.  
Advisor: Professor Jim Pitman

## Work Experience *Software Development Engineer* **May - August 2005**

Amazon.com, Seattle Wa  
Developed new packages to enhance Amazon's promotions capabilities; beta run of the project as a joint promotion with Burger King and The Fantastic Four summer blockbuster resulted in over \$1M in gross merchandise sales. Also took on a side project to develop a new collaborative filtering algorithm for books that considers statistically improbable content when making recommendations.

*Software Engineer* **May - August 2004**  
Intel Corporation, Chandler Az  
Designed, implemented and tested a user interface for a vision inspection system on the manufacturing line. Built the GUI to establish communications and receive data from cameras on the shuttle, which is then programmatically processed to allow for real-time quality control of the product.

*Resource Analyst and Financial Management* **May - August 2003**  
NASA Ames Research Center, Mountain View Ca  
Supported a branch of over 17 scientists through the integration of NASA's new financial management system using SAP technology. Developed accounting spreadsheets and assisted with the reorganization of the branch's finance management strategies.

*Website Design and Requirements Development* **June - August 2001**  
Intrinsyx Technologies, Mountain View Ca  
Co-designed the company website ([www.intrinsyx.com](http://www.intrinsyx.com)). Completed a requirements document for NASA's International Space Station and Space Shuttle Life Sciences Payloads online code library.

## Honors and Awards

National Science Foundation Graduate Research Fellowship (effective 2007 - 2010)

*Finalist*, 2006 Technology Breakthrough Competition – Greatest Social Impact Award  
Received accolades for my project to build iCare: a direct person-to-person charity for efficient disaster relief.  
Sponsored by UC Berkeley's Center for Entrepreneurship and Technology.

*Winner*, 2006 Bears Breaking Boundaries – Curricular Innovation.  
Co-authored a proposal with Anand Kulkarni for an interdisciplinary course titled "The Art of Mathematical Modeling."

Sponsored by the Center for Information Technology Research in the Interest of Society.

*Outstanding paper* (top 1 percent), International Mathematical Contest in Modeling, 2005.

Ben Fusaro award winner for best model.

Run by the Consortium for Mathematics and its Applications; sponsored by SIAM, INFORMS and MAA.

*Meritorious winner* (top 10 percent), International Mathematical Contest in Modeling, 2004.

## Publications

(In Progress.) E. Bitton, V. Plaks, B. Fishbain, D. Hochbaum. Identifying Differentially Expressed Genes with Graph Partitioning.

S. Faridani, E. Bitton, K. Ryokai, K. Goldberg. Opinion Space: A Scalable Tool for Browsing Online Comments. *Proceedings of the 28th ACM International Conference on Human Factors in Computing Systems*, 2010.

E. Bitton. A Spatial Model for Collaborative Filtering of Comments in an Online Discussion Forum. *Proceedings of the ACM Conference on Recommender Systems (RecSys2009)*, 2009.

T. Nathanson, E. Bitton, K. Goldberg. Donation Dashboard: Recommending Non-Profit Donation Portfolios. *Proceedings of the ACM Conference on Recommender Systems (RecSys2009)*, 2009.

E. Bitton, K. Goldberg. Hydra: A Framework and Algorithms for Mixed-Initiative UAV-Assisted Search and Rescue. *IEEE International Conference on Automation Science and Engineering*, 2008.

J. Thayer, W. Ruml, E. Bitton. Fast and Loose in Bounded Suboptimal Heuristic Search. *Proceedings of the First International Symposium on Heuristic Search in Artificial Intelligence and Robotics (STAIR-08)*, pp. 120-12, 2008.

T. Nathanson, E. Bitton, K. Goldberg. Eigentaste 5.0: Constant-Time Adaptability in a Recommender System Using Item Clustering. *Proceedings of the ACM Conference on Recommender Systems (RecSys2007)*, 2007.

E. Bitton, A. Kulkarni, M. Shlimovich. Two Tools for Tollbooth Optimization. *Undergraduate Mathematics and Its Applications (UMAP)*, 2005.

## Invited Talks

“A New Perspective on Social Media.”

UC Berkeley Fundraising Council Panel on Social Media, UC Berkeley, June 2010

“Opinion Space: A Scalable Tool for Browsing Online Comments”

ACM Conference on Human Factors in Computing Systems (CHI), Atlanta GA, April 2010

“A Spatial Model for Collaborative Filtering of Comments in an Online Discussion Forum.”

Doctoral Symposium, ACM Conference on Recommender Systems, New York University, October 2009.

“Introduction to Industrial Engineering and Operations Research”

IEOR Freshmen Seminar, UC Berkeley, August 2009

“Opinion Space: Spatial Representations of Opinion Diversity”

Poster presentation. The Soul of the New Machine: Human Rights, Technology, and New Media, UC Berkeley, May 2009

“Donation Dashboard: Customizing Your Charitable Donations with Collaborative Filtering”

Technology and Philanthropy Course, Stanford University, February 2009

“Hydra: A Framework and Algorithms for Mixed-Initiative UAV-Assisted Search and Rescue”  
IEOR Graduate Student Seminar, UC Berkeley, November 2008

“Hydra: A Networked, Collaborative Simulation and Visualization Tool for Single and Multiple UAV-assisted Search”

Year 1 review meeting of the AFOSR project on Human Centric Design Environments for Command and Control Systems: The C2 Wind Tunnel, September 2007

“Using the Web for Disaster Relief”

Net Tuesday, San Francisco, September 2007

**Professional  
Activities**

*Program Committee Member*

**Spring 2010**

ACM Conference on Recommender Systems

*Member*

**September 2006 - May 2007**

INFORMS, Berkeley chapter

*Member, officer*

**January 2005 - May 2006**

Alpha Pi Mu, the only nationally recognized Industrial Engineering honors society.

Systems administrator of Berkeley chapter website.

URL: [www.ieor.berkeley.edu/~apm](http://www.ieor.berkeley.edu/~apm)