

Benjamin Lubin

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Education

- Harvard University, Cambridge, MA: Ph.D. Computer Science, June 2010 (expected)
- Harvard University, Cambridge, MA: SM Computer Science, June 2005
- Harvard University, Cambridge, MA: AB *magna cum laude*, June 1999
Computer Science concentration with Mind Brain Behavior honors certification; Dean's List
- Bronx High School of Science, Bronx, NY, 1995

Research Interests

- Multi-agent systems, Game theory, Mechanism design, Electronic commerce, Combinatorial optimization, Preference elicitation and representation, Distributed Systems, Grid Computing

Work / Research Experience

Ph.D. Graduate Student Fall 2005–Current
Harvard Computer Science Dept. Cambridge, MA

- Designed and constructed with coauthors the Iterative Combinatorial Exchange (ICE), a system which mediates complex trades in order to provide desirable economic and game theoretic properties. Agents specify their non-linear values in a concise and descriptive way, and the system determines the optimal allocation and appropriate payments. Because agents interact with the system in an iterative manner and are provided useful price feedback, they need only determine partial bounds on their valuation function at any given time.
- Evaluated existing and novel payment rules that provide individual rationality, budget balance, and approximate incentive compatibility in a CE context, taking a novel distributional view.
- Investigated the use of CEs in the trade of aircraft landing-slots and computational resources.

Research Intern Summer 2008
IBM Research Hawthorne, NY

Applied a combinatorial auction loosely based on ICE to the provisioning of data center resources in order to optimize the tradeoff of power consumption for performance, in the context of response-time varying application value.

Software Engineer Fall 1999–Summer 2005
Distributed Systems and Logistics department at BBN Technologies Cambridge, MA

- Played a critical role in team projects that have:
- Designed and implemented a novel large-scale multi-agent optimizing logistics planning system
 - Created a proprietary scheduling system using a genetic algorithm to continually determine optimal crew assignments (given complex criteria) for military air missions while facilitating collaboration between automated and human schedulers.
 - Created an infrastructure for joining logistics models that were not designed to work together into a cohesive system; also produced a GUI that facilitated human comprehension / modification of the vast number of interrelated variables involved in the models.

Mind/Brain/Behavior Thesis Grant Recipient Summer 1998–Spring 1999
Harvard Computer Science Dept. Cambridge, MA

Designed & implemented a collaborative GUI for desktop publishing via a mass-spring model.

Application Programmer Summer 1996 and 1997
Datacap, Inc. Irvington, NY

Independently designed and built four modules for Datacap's scanning/OCR software.

Researcher/Hardware Developer

Nevis Labs (Columbia University's physics complex)

Created several hardware and software components as part of a small team developing a new high-speed, high-volume data acquisition system for the ATLAS detector at CERN.

1993-1995

Ardsley, NY

Teaching Experience**Guest Lecturer**

Spring 2006, Fall 2007

- Harvard Econ 2056: Market Design (*Al Roth*)
- CMU CS 15-892: Foundations of Electronic Marketplaces (*Tuomas Sandholm*)

Teaching Fellow

Fall 1997, Summer 1998, Spring 2006, Spring 2008

Harvard Computer Science Dept.

Cambridge, MA

- CS1 – Intro to Computer Science
- CS182 – Intelligent Machines: Reasoning, Actions, and Plans
- CS286r – Topics at the Interface between Computer Science and Economics
- AM121 – Intro to Optimization: Models and Methods

Senior Workshop Leader

Spring 2004-2006

Harvard Mind/Brain/Behavior program

Cambridge, MA

- Led multi-disciplinary sessions involving all tracks of the MBB program
- Provided feedback and advice on undergraduate senior theses

Publications

B. Lubin, D. Parkes. (2009). Quantifying the Strategyproofness of Mechanisms via Metrics on Payoff Distributions. Forthcoming *Proc. of the 25th Conf. on Uncertainty in Artificial Intelligence (UAI-09)*.

B. Lubin, J. Kephart, R. Das, D. Parkes. (2009). Expressive Power-Based Resource Allocation for Data Centers. Forthcoming *Proc. of the 21st International Joint Conf. on Artificial Intelligence (IJCAI-09)*.

B. Lubin, A. Juda, R. Cavallo, S. Lahaie, J. Schneidman, D. Parkes. (2008). ICE: An Expressive Iterative Combinatorial Exchange. *Journal of Artificial Intelligence Research (JAIR)*, 33, 33-77.

R. Cavallo, D. Parkes, A. Juda, A. Kirsch, A. Kulesza, S. Lahaie, B. Lubin, L. Michael, J. Shneidman. (2005). TBBL: A Tree-Based Bidding Language for Iterative Combinatorial Exchanges. *Proc. of the Multidisciplinary Workshop on Advances in Preference Handling (IJCAI)*.

D. Parkes, R. Cavallo, N. Elprin, A. Juda, S. Lahaie, B. Lubin, L. Michael, J. Shneidman, H. Sultan. (2005). ICE: An Iterative Combinatorial Exchange. *Proc. of the 6th ACM Conf. on Electronic Commerce (EC -05)*, 249-258.

S. Rana-Stevens, B. Lubin, D. Montana. (2000). The Air Crew Scheduling System: The Design of a Real-World, Dynamic Genetic Scheduler. *Proc. of the 2nd Genetic and Evolutionary Computation Conf. Late Breaking Papers*, 317-324.

Invited Talks

- “*Iterative Combinatorial Exchanges: An Experimental Analysis.*” The Institute for Operations Research and the Management Sciences (INFORMS) 2007 Annual Conference

Professional Services

- Program Committee: *The 8th International Conf. on Autonomous Agents and Multi-agent Systems (AAMAS)*, 2009
- Referee: *The 8th ACM Conf. on Electronic Commerce (EC)*, 2007
- Referee: *The 7th ACM Conf. on Electronic Commerce (EC)*, 2006
- Referee: *The 22nd Conf. on Uncertainty in Artificial Intelligence (UAI)*, 2006
- Referee: *The 21st National Conf. on Artificial Intelligence (AAAI)*, 2006

- Organizer: Econ/CS Research Seminar, Harvard University, 2006

Selected Awards and Distinctions

- Siebel Scholars Fellowship, 2009-2010
- Yahoo! Key Technical Challenge (KTC) Grant, 2007
- BBN Masters tuition grant
- Harvard Mind-Brain-Behavior Research Grant
- Harvard College Scholar, 1996-1999
- SERC (Student Energy Research Competition) grant winner