

February 2015

## CURRICULUM VITAE

NAME: Daniel Friedman

CITIZENSHIP: U.S.A.

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Santa Cruz, CA 95064

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## DEGREES:

Ph.D., Mathematics, University of California, Santa Cruz, 1977  
(Thesis Supervisor: Stephen Smale)  
M.A., Mathematics, University of California, Santa Cruz, 1973  
B.S., Mathematics, Reed College, Portland, Oregon, 1969

**CURRENT RESEARCH INTERESTS:**

Applied Economic Theory, Learning & Evolution, Experimental Economics, Financial Markets

## ACADEMIC APPOINTMENTS

**Permanent:**

Distinguished Professor, University of California, Santa Cruz, 2011-  
Professor of Economics, University of California, Santa Cruz, 1989-2011  
Associate Professor of Economics, UCSC, 1985-89  
Assistant Professor, Department of Economics, UCLA 1979-1985

**Temporary:**

Research Professor in Market Design, WZB (Berlin), 2015-  
 Founder and Director, LEEPS Lab, 1986-  
 Chair, Economics Department, UCSC, 1998-2001  
 Co-Director, Summer School in Behavioral Economics, Trento, 2001, 2003, 2011, 2012  
 Director, MS Program in Applied Economics and Finance, UCSC, 1993-97  
 Visiting Scientist, Xerox PARC, January-March 1998  
 Visiting Professor, Scholar or Researcher:  
   Oxford (Nuffield College, CESS) scheduled for May 2016; WZB (Berlin), May 2013;  
   Cambridge (Judge School), April-May 2012; Yale, April 2011; CESifo, Munich, May 2011;  
   Chapman University, February, 2011; Technion, Haifa, January 2011; NYU, November  
   2010; U of Arizona, February 2003; Yale, April 2003; University College London/ELSE,  
   August 2003; Harvard, October-November 2002; Caltech, December 2002; MIT, April-May  
   1998; CES, University of Munich, May 1997; CEEL, University of Trento, May 1996; WiThI,  
   University of Bonn, May-June 1994; CentER, University of Tilburg, May-June 1992;  
   Stanford Business School, 1991-92; Department of Economics, University of Arizona, Spring  
   1985; UC Berkeley Business School, 1983-4; Instituto di Economia, University of Siena, May  
   1984  
 Instructor of Mathematics, College of Marin, Kentfield, CA, 1975; UC Santa Cruz, 1973

**OTHER APPOINTMENTS:**

Senior Financial Consultant, Bank of America, San Francisco, 1977-1979  
Systems Analyst, Education Reform Project, Berkeley, CA, 1975-1976  
Consultant, Thomte-Roper, Inc., Boston, MA, 1974

## GRANTS AND AWARDS

### National Science Foundation grants:

- "Preferences and Equilibrium in Laboratory Financial Markets," with S. Crockett and R. Oprea, SES-1357867, 2014-16.
- "Economic Analysis of Recommender Systems," with T. Wu and Y. Zhang, CCF-1101741, 2011-15.
- "Continuous Games in the Lab," with Ryan Oprea, SES-0925038, 2009-12
- "IT-Enabled Markets," with J. Cox and J. Spohrer, IIS-0527770, 2006-09.
- "Landscape Dynamics," with Ralph Abraham, SES-0436509, 2005-09.
- "Networked Markets," with A. Cassar and P. Schneider, SBR-0351801, 2004-09.
- "Market Dynamics in Cyberspace," with Bernardo Huberman, IIS-9986651, 2000-04.
- "A Laboratory Study of Customer Markets," with Timothy Cason, SBR-9617648, 1997-2000.
- "Optimal and Adaptive Learning Models," with Dominic Massaro, SBR-9310347, 1993-97.
- "Development of Applied Economics Laboratory Courses" with D. Wittman, DUE-9351763, 1993-96.
- "Price Formation and Learning," with Timothy Cason, SBR-9223461, 1993-96.
- "Evolutionary Game Experiments," SES-9023945, 1991-93.
- "Financial Market Mechanisms," IRI-8812789, 1988-91.
- "Experimental Asset Markets" with Thomas E. Copeland, SES-8411382, 1984-87.

### Other grants:

- "Online Ad Auctions: A Laboratory Experiment," Google Research Award, 2014-15.
- "Boiling the Frog Optimally: A Laboratory Experiment," HP Labs IRP award, 2011-12.
- "Tradable Quota Rights for Fishing," with Ryan Oprea, grant from Environmental Defense, 2007-08.
- "Game Theory Curriculum," UCSC Committee on Teaching grant, 2007-08.
- Academic Senate and Social Sciences Division, UCSC, numerous small grants, 1985-present.
- UCLA Academic Senate Research Grant, Career Development Award, and Foundation for Research in Economics and Education Grants, 1979-83.
- "Futures Market Experiments" with Glenn Harrison and Jon Salmon, Futures Markets Research Grant from Columbia University, 1981-82.
- "Econogames," UC Instructional Improvement Grant, 1979-1980.

### Awards:

- Exeter Prize (£ 3,000, shared with R. Oprea) for Research in Experimental Economics, Decision Theory and Behavioral Economics, 2012.
- Fellow, Society for the Advancement of Economic Theory, 2011-
- UCSC Faculty Research Lecturer for 2009-10.
- Martin M. Chemers Award (\$2,500) for Outstanding Research in the Social Sciences Division, 2008.
- Royal Economic Society Prize (£ 3,000) for best 1996 paper published in *The Economic Journal*.
- Favorite Professor Award, Student Alumni Council, UCSC Alumni Association, 1990-91.

## SELECTED PUBLICATIONS

### Books:

- Risky Curves: on the Empirical Failure of Expected Utility*, with R. Mark Isaac, Duncan James and Shyam Sunder. Routledge, 2014.
- Morals and Markets: An Evolutionary Account*, Palgrave Macmillan, 2008. Second Edition, coauthored with Daniel McNeill and subtitled *A Dangerous Balance*, June 2013. Korean Translation by
- Economics Lab: An Intensive Course in Experimental Economics*, with Alessandra Cassar, Routledge, 2004.
- Experimental Methods: A Primer for Economists*, with Shyam Sunder, Cambridge University Press, 1994. Japanese translation by T. Uchiki, T. Kawagoe and T. Mori, Dobunkan Publishers, 1999. Chinese translation by Fang-Fang Tang, Chinese University of Hong Kong, 2004.

*The Double Auction Market: Institutions, Theories and Evidence*, co-edited with John Rust, Santa Fe Institute Proceedings Volume XIV, Addison-Wesley, 1993.

### Journal Articles:

"From Imitation to Collusion: Long-run Learning in a Low-Information Environment," with Ryan Oprea, Steffen Huck and Simon Weidenholzer, forthcoming, *Journal of Economic Theory*.

"Hotelling Revisits the Lab: Equilibration in Continuous and Discrete Time," with Curtis Kephart, conditionally accepted for inaugural issue of the *Journal of the Economic Science Association*.

"Tractable Consumer Choice," with Jozsef Sakovics, forthcoming, *Theory and Decision*.

"Continuous Time and Communication in a Public-goods Experiment," with Ryan Oprea and Gary Charness, *Journal of Economic Behavior and Organization* 108, pp. 212–223 (2014).

"Software for Continuous Game Experiments," with James Pettit, Curtis Kephart, and Ryan Oprea, *Experimental Economics* 17:4 pp. 631–648 (2014).

"Incomplete Information, Dynamic Stability and the Evolution of Preferences: Two Examples," with Jean Paul Rabanal, *Dynamic Games and Applications* 4:4, pp. 448–467 (2014).

"Cycles and Instability in a Rock-Paper-Scissors Population Game: a Continuous Time Experiment," with Tim Cason and Ed Hopkins, *Review of Economic Studies* 81:1, pp. 112–136 (2014).

"Evolutionary Dynamics over Continuous Action Spaces for Population Games that Arise from Symmetric Two-player Games," with Daniel Ostrov, *Journal of Economic Theory* 148:2, pp. 743–777 (2013).

"A Continuous Dilemma," with Ryan Oprea, *American Economic Review* 102:1, pp. 337–363 (February 2012). Awarded the 2012 Exeter Prize for Research in Experimental Economics, Decision Theory and Behavioral Economics.

"Separating the Hawks from the Doves," with Keith Henwood and Ryan Oprea, *Journal of Economic Theory* 146:6, pp. 2206–2225 (2011).

"Human and Artificial Agents in a Crash-Prone Financial Market," with Todd Feldman, *Computational Economics* 36:3, pp. 201–229 (December 2010).

"Testing the TASP: An Experimental Investigation of Learning in Games with Unstable Equilibria," with Timothy Cason and Ed Hopkins, *Journal of Economic Theory* 145:6, pp. 2309–2331 (November 2010).

"Preemption Games: Theory and Experiment," with Steven T. Anderson and Ryan Oprea, *American Economic Review* 100:4, pp. 1778–1803 (September 2010).

"A Laboratory Investigation of Networked Markets," with Alessandra Cassar and Patricia Higinio Schneider, *Economic Journal* 120[547], pp. 919–943 (September 2010).

"Gradient Dynamics in Population Games: Some Basic Results," with Daniel Ostrov, *Journal of Mathematical Economics* 46:5, pp. 691–707 (September 2010).

- "Financial Engineering and Rationality: Experimental Evidence Based on the Monty Hall Problem," with Brian Kluger, *Journal of Behavioral Finance* 11:1, pp. 31–49 (January 2010).
- "Bubbles and Crashes: Gradient Dynamics in Financial Markets," with Ralph Abraham, *Journal of Economic Dynamics and Control* 33: 4, pp. 922-937 (April 2009)
- "Equilibrium Vengeance," with Nirvikar Singh, *Games and Economic Behavior* 66:2, pp. 813-829 (July 2009).
- "A Laboratory Investigation of Deferral Options," with Ryan Oprea and Steven T. Anderson, *Review of Economic Studies* 76: 3, pp. 1103–1124 (July 2009).
- "Speculative Attacks: A Laboratory Study in Continuous Time," with Yin Wong Cheung, *Journal of International Money and Finance* 28:6, pp. 1064-1082 (October 2009).
- "Cheating in Markets: A Laboratory Study," with Alessandra Cassar and Patricia Higinio Schneider, *Journal of Economic Behavior and Organization* 72:1, pp. 240-259 (October 2009).
- "Conspicuous Consumption Dynamics," with Daniel Ostrov, *Games and Economic Behavior* 64:1, pp. 121-145 (October 2008)
- "Revealed Altruism," with James C. Cox and Vjollca Sadiraj, *Econometrica* 76:1, 31–69 (January 2008)
- "Buy it Now: A Hybrid Internet Market Institution", with Steven Anderson, Garrett Milam and Nirvikar Singh, *Journal of Electronic Commerce Research* 9:2, 137-153 (May 2008)
- "Seller Strategies on eBay: Does Size Matter?", with Steven Anderson, Garrett Milam and Nirvikar Singh, *International Journal of Electronic Business* 5:6, 643-669 (2007).
- "Markups in Double Auction Markets," with Wenjie Zhan, *Journal of Economic Dynamics and Control* 31:9, 2984-3005 (September 2007).
- "A Tractable Model of Reciprocity and Fairness," with James C. Cox and Steven Gjerstad, *Games and Economic Behavior* 59:1, 17-45 (April 2007).
- "Litigation with Symmetric Bargaining and Two-Sided Incomplete Information," with Donald Wittman, *Journal of Law, Economics and Organization*, 23:1, 98 – 126 (April 2007).
- "Searching for the Sunk Cost Fallacy," with Kai Pommerenke, Rajan Lukose, Garrett Milam, and Bernardo Huberman, *Experimental Economics* 10:1, 79-104 (March 2007).
- "The Dynamics of Price Dispersion, or Edgeworth Variations," with Timothy Cason and Florian Wagener, *Journal of Economic Dynamics and Control*, 29(4), 801-822 (April 2005).
- "Negative Reciprocity: The Coevolution of Memes and Genes," with Nirvikar Singh, *Evolution and Human Behavior*, 25(3), 155-173 (May 2004).
- "Buyer Search and Price Dispersion: A Laboratory Study," with Tim Cason, *Journal of Economic Theory*, 112(2), 232-260, (October 2003).

- "Bargaining vs. Posted Price Competition in Customer Markets," with Tim Cason and Garrett Milam, *International Journal of Industrial Organization*, 21(2), 223-251 (February 2003).
- "Learning to Forecast Price," with Hugh M. Kelley, *Economic Inquiry*, 40:4, 556-573 (October 2002).
- "A Laboratory Study of Customer Markets," with Tim Cason, *Advances in Economic Analysis & Policy*: Vol. 2: No. 1, Article 1 (2002). <http://www.bepress.com/bejeap/advances/vol2/iss1/art1/>
- "Towards Evolutionary Game Models of Financial Markets," *Quantitative Finance* 1:1, 177-185 (January 2001). Reprinted in *Beyond Equilibrium and Efficiency*, D. Farmer and J. Geanakoplos (eds), Oxford University Press, 2002.
- "Learning in Laboratory Markets with Random Supply and Demand," with Timothy Cason, *Experimental Economics* 2:1, 77-98 (January 1999).
- "The Matching Market Institution: A Laboratory Investigation," with Changhua Rich, *American Economic Review* 88:5, 1311-1322 (December 1998).
- "Understanding Variability in Binary and Continuous Choice," with Dominic Massaro, *Psychonomic Bulletin and Review*, 5:3, 370-389 (September 1998).
- "Monty Hall's Three Doors: Construction and Deconstruction of a Choice Anomaly," *American Economic Review* 88:4, 933-946 (September 1998).
- "Broadening the Tests of Learning Models," with Steven Kitzis, Hugh Kelley, Eric Berg and Dominic Massaro, *Journal of Mathematical Psychology* 42:2, 327-355 (June 1998).
- "A Comparison of Learning and Replicator Dynamics Using Experimental Data," with Yin-Wong Cheung, *Journal of Economic Behavior and Organization* 35:3, 263-280 (April 1998).
- "On Economic Applications of Evolutionary Game Theory," *Journal of Evolutionary Economics* 8:1, 15-43 (March 1998). Reprinted in *Recent Developments in Evolutionary Economics*, edited by Ulrich Witt, Edward Elgar Publishing, 2008.
- "Individual Learning in Games: Some Laboratory Results," with Yin-Wong Cheung, *Games and Economic Behavior* 19:1, 46-76 (April 1997).
- "Price Formation in Single Call Markets," with Timothy Cason, *Econometrica* 65:2, 311-345 (March 1997).
- "Learning Liability Rules," with Donald Wittman, Stephanie Crevier and Aaron Braskin, *Journal of Legal Studies* 26:1, 145-164 (January 1997).
- "International Trade and the Internal Organization of Firms: An Evolutionary Approach," with K.C. Fung, *Journal of International Economics* 41:1-2, 113-136 (August 1996).
- "Price Formation in Double Auction Markets," with Timothy Cason, *Journal of Economic Dynamics and Control* 20:8 1307-1337 (August 1996).
- "Equilibrium in Evolutionary Games: Some Experimental Results," *Economic Journal* 106:434, 1- 25 (January 1996). Awarded the Royal Economic Society Prize for the best EJ paper of 1996.
- "A Comparison of Learning Models," with Dominic Massaro, Stephen Kitzis and Michael M. Cohen, *Journal of Mathematical Psychology* 39:2, 164-178 (June 1995).

- "Competitiveness in Auction Markets: An Experimental and Theoretical Investigation," with Joseph Ostroy, *Economic Journal* 105, 22-53 (January 1995).
- "Why Voters Vote for Incumbents But Against Incumbency: A Rational Choice Explanation," with Donald Wittman, *Journal of Public Economics* 57, 67-83 (1995).
- "On Evolution and Learning in Games," *Cuadernos Economicos de ICE* 54:2, 171-196 (December+ 1993).
- "Privileged Traders and Asset Market Efficiency: A Laboratory Study," *Journal of Financial and Quantitative Analysis*, 28:4, 515-534 (December 1993).
- "How Trading Institutions Affect Financial Market Performance: Some Laboratory Evidence," *Economic Inquiry*, 31:3, 410-435 (July 1993).
- "Inefficient Information Aggregation as a Source of Asset Price Bubbles," with Masanao Aoki, *Bulletin of Economic Research* 44:4, 251-279 (October 1992).
- "The Market Value of Information: Some Experimental Results," with Thomas E. Copeland, *Journal of Business*, 65:2 (April 1992), 241-266.
- "Evolutionary Games in Economics," *Econometrica*, 59:3 (May 1991) 637-666. Reprinted in Eric Maskin, ed., *Recent Developments in Game Theory*, a volume in the series *The International Library of Critical Writings in Economics*, Northampton, MA: Edward Elgar, 1999.
- "Partial Revelation of Information in Experimental Asset Markets," with Thomas E. Copeland, *Journal of Finance*, 46:1 (March 1991) 265-295
- "A Simple Testable Model of Double Auction Markets," *Journal of Economic Behavior and Organization*, 15:1 (January 1991) 47-70.
- "Models of Integration Given Multiple Sources of Information," with Dominic Massaro, *Psychological Review* 97:2 (April 1990) 225-252.
- "The S-Shaped Value Function as a Constrained Optimum," *American Economic Review* 79:5 (December 1989) 1243-48.
- "Producers' Markets: A Model of Oligopoly with Sales Costs," *Journal Economic Behavior and Organization*, 11:3 (May 1989) 381-398.
- "The Effect of Sequential Information Arrival on Asset Prices: An Experimental Study," with Thomas E. Copeland, *The Journal of Finance*, 42:3 (July 1987) 763-797.
- "Two Microdynamic Models of Exchange," *Journal of Economic Behavior and Organization* 7:2 (June 1986).
- "The Informational Efficiency of Experimental Asset Markets," with Glenn W. Harrison and Jon W. Salmon, *Journal of Political Economy*, 92:3 (June 1984), pp. 349-408.
- "On the Efficiency of Double Auction Markets," *American Economic Review*, 74:1 (March 1984), pp. 60-72.
- "Effective Scoring Rules for Probabilistic Forecasts," *Management Science*, 29:4 (April 1983), pp. 447-454.

"Short-run Fluctuations in Foreign Exchange Rates: Evidence from the Data, 1973-79," with Stoddard Vandersteel, *Journal of International Economics*, 13 (1982), pp. 171-186.

"Short-Run Behavior of Labor Productivity: Tests of the Motivation Hypothesis," with David Stern, *Journal of Behavioral Economics*, Winter 1980, pp. 89-105.

"Money Mediated Disequilibrium Processes in a Pure Exchange Economy," *Journal of Mathematical Economics*, 6, (1979), pp. 149-167.

### **Surveys, Book Chapters, and Miscellany:**

"Complex Dynamical Systems and the Social Sciences," with Ralph Abraham and Paul Viotti, in *Qualitative Mathematics for the Social Sciences: Mathematical Models for Research on Cultural Dynamics*, Lee Rudolph and Jaan Valsiner, eds. Routledge: *Behavioural Sciences Monographs* (2012).

"Preferences, Beliefs and Equilibrium: What Have Experiments Taught Us?" symposium note, *Journal of Economic Behavior and Organization*, 73:1 pp. 29-33 (January 2010).

"Bubbles and Crashes: A Cyborg Approach," with Ralph Abraham, and Todd Feldman, in S. Zambelli, ed., *Computable, Constructive and Behavioural Economic Dynamics: Essays in Honour of Kumaraswamy (Vela) Velupillai*, Routledge, 2010.

Chapters in C. Plott and V. Smith, eds, *Handbook of Experimental Economic Results*, 2008:

"A Comparison of Market Institutions," with Timothy Cason;

"The Matching Market," with Changhua Sun Rich;

"Equilibrium Convergence in Normal Form Games," with Nicole Bouchez; and

"Learning to Forecast Rationally," with Hugh Kelley.

"Landscape Dynamics, Complex Dynamics, and Agent Based Models," with Ralph H. Abraham, *Journal of the Calcutta Mathematical Society* 2:2 (2007), pp. 1-11.

"Market Theories Evolve, and So Do Markets," symposium note, *Journal of Economic Behavior and Organization* 63 (2), p.247-255, June 2007.

"Laboratory Financial Markets," article in *New Palgrave Dictionary of Economics, Second Edition*, May 2008.

"Laboratory Methodologies: The Case of Cheating," in S. Oda, editor, *Developments on Experimental Economics*, Springer Lecture Notes in Economics and Mathematical Sciences #590, July 2007.

"Vengefulness Evolves in Small Groups," with Nirvikar Singh, in S. Huck, ed., *Advances in Understanding Strategic Behavior*, NY: Palgrave Macmillan, 2004.

"Internet Congestion: A Laboratory Experiment, " with Bernardo Huberman, in R. Zwick, ed., *Experimental Business Research, Vol II*, New York: Kluwer, October 2005. A shorter version of the same article, aimed at computer scientists, has appeared in *Proceedings of the ACM SIGCOMM 2004 Workshops*, ACM Press, NY (ISBN: 1-58113-942-X), 177-182.

"Asset Market Experiments," with Hugh Kelley, article in *Encyclopedia of Cognitive Science*, London: Macmillan Reference, 2003.

- "Auctions: Research Opportunities in Marketing," with Dipankar Chakravarti et al, *Marketing Letters*, 13: 3 (August 2002), 281 - 296.
- "Evolution and Negative Reciprocity," with Nirvikar Singh, in Y. Aruka, ed., *Evolutionary Controversies in Economics*, Springer, 2001.
- "Psychological Economics in the Late 1990s" (Review of Amnon Rapoport Festschrift), *The American Journal of Psychology* 113:1 (Spring, 2000), 147-149.
- "Customer Search and Market Power: Some Laboratory Evidence," with Timothy Cason, in M. R. Baye, ed, *Advances in Applied Microeconomics, Volume 8: Oligopoly*, JAI Press, 1999.
- "Evolutionary Economics Goes Mainstream: A Review of The Theory of Learning in Games," *Journal of Evolutionary Economics* 8:4 423-432 (December 1998).
- "Price Formation and Exchange in Thin Markets: A Laboratory Comparison of Institutions," with Timothy Cason, in P. Howitt, E. de Antoni and A. Leijonhufvud (Eds.) *Money, Markets and Method: Essays in Honour of Robert W. Clower*, Elgar, 1998.
- "Term Limits as Political Redistribution," with Donald Wittman, Chapter 14 in B. Grofman (ed.), *Legislative Term Limits: Public Choice Perspectives*, Kluwer, Boston, 1996.
- "An Empirical Analysis of Price Formation in Double Auction Markets," with Timothy Cason, in D. Friedman and J. Rust, eds, *The Double Auction Market: Institutions, Theories and Evidence*, Santa Fe Institute Proceedings Volume XIV, Addison-Wesley, 1993.
- "The Double Auction Market Institution: A Survey," in *Double Auction Market* volume, 1993.
- "Theory and Misbehavior: A Comment," *American Economic Review*, 82:5 (December 1992), pp. 1374-78.
- "Adaptive Rationality and Identifiability of Psychological Processes," with Dominic Massaro, *Behavioral and Brain Sciences*, 14 (1991) pp. 499-501.
- "Asset Price Bubbles from Poorly Aggregated Information: A Parametric Example," with Masanao Aoki, *Economics Letters* 21 (1986), pp. 49-52.
- "A Comment on 'Creation vs. Discovery,'" *American Economic Review*, 75:1 (March 1985) p. 264.
- "Trade Specialists and Money in an Ongoing Exchange Economy," with R.W. Clower, Chapter 5 in R. Day and G. Eliasson (eds.), *The Dynamics of Market Exchange*, North-Holland, 1986.
- "The Informational Role of Futures Markets and Learning Behavior: Some Experimental Evidence," with Glenn W. Harrison and Jon W. Salmon, in *Futures Markets: Modeling, Managing and Monitoring Futures Trading*, ed., by Manfred E. Streit, Basil Blackwell, Oxford, 1983.
- "Makin's MARP: A Comment," *Journal of Finance*, 36 (June 1981), pp. 739-41.

## LECTURES AND PRESENTATIONS:

### 2014:

- "Risky Curves," Behavioral and Experimental Economics Workshop, UC Santa Barbara, February 6; Helsinki University, May 9; Exeter University (Prize Lecture) May 12.
- "Creating Data via Human Subjects Experiments," Joint Engineering-Economics Data Analytics Seminar, UCSC, February 25.



"Continuous Population Game Dynamics: Theory, Experiment, and Applications," plenary talk, International Game Theory Conference, Stony Brook NY, July 9.

"Online Ad Auctions: A Laboratory Experiment," Stanford Institute of Theoretical Economics Workshop 7, August 19.

### 2013:

"Risky Curves," WZB Seminar, Berlin 16 May; GATE Seminar, Lyon 22 May 2013;

"Online Ad Auctions: A Laboratory Experiment," Google Economics Lunch, September 5.

### 2012:

"From Imitation to Collusion: Long-run Learning in a Low-Information Environment," Behavioral and Experimental Economics Workshop, UC Santa Barbara, February 3; Cambridge Judge Business School, May 1; University of Edinburgh, May 11.

"On the Origins of Social Preferences," ASREC12, Chapman University, March 9.

"Cycles and Instability in a Rock-Paper-Scissors Population Game: a Continuous Time Experiment," Contests, Mechanisms & Experiments Conference, University of Exeter, April 28; International ESA Conference, NYU, June 23.

"Experimental Methods in Economics," Cambridge Judge Business School seminar, May 8.

"Marginal Utility of Money," Cambridge University Microeconomic Theory Seminar, May 16.

"Boiling the Frog Optimally," UCSC Psychology Department Colloquium, October 24.

"Risky Curves," Economic Science Association Meetings, Tucson, November 17.

### 2011:

"Separating the Hawks from the Doves," Hebrew University, January 11; Tel Aviv U, January 12; Ben-Gurion University, January 13; Technion, January 19.

"Evolutionary Dynamics for Playing the Field," Southwestern Economic Theory conference, Cal Poly SLO, February 25; University of Wisconsin, April 1; University of Vienna, April 14.

"The Evolution of Social Preferences, I, II and III," CESifo minicourse, Munich, April 19-21.

"Insurgency: A Real-Time Laboratory Study," University of San Francisco, April 7; Bay Area Experimental Economics Workshop, UC Berkeley, May 7.

"Marginal Utility of Money," Brown Bag Workshop, UCSC Economics, May.

"Congestion Games in Real Time," Experimental Economics Examination of Road Pricing Workshop, CEAR, Atlanta, December 5.

### 2010:

"Games Played in Continuous Time," Behavioral and Experimental Economics Workshop, UC Santa Barbara, February 6.

"Separating the Hawks from the Doves," Cambridge University Business School Seminar, May 18; University College London Economics Seminar, May 21; Stockholm School of Economics Seminar, May 28.

"Gradient Dynamics for Population Games," Econ Theory Workshop, Saltsjobaden, Sweden, May 27.

"How Theory Informs Experiments (and Vice-versa)," Plenary address, ESA Regional Meetings, Tucson, November 17.

### 2009:

"Bubbles, Crashes and Cyborg Markets," CenDEF Workshop, University of Amsterdam, January 7; UPF, Barcelona, June 3.

"Continuous Dilemmas," Economics Department Seminar, Harvard, March 31; Economics Department Seminar, NYU, April 2; Economics Department Seminar, UPF, Barcelona, June 2; Oxford-Man Game Theory Workshop, Oxford UK, September 18.

"Landscape Dynamics for Population Games," Math Colloquium, UCSC, May 19.

"Preemption: Theory and Experiment," XVIII European GE Workshop, Barcelona, June 5.

"Separating the Hawks from the Doves," ESA Workshop, Tucson, November 13.

**2008:** "Preemption: Theory and Experiment," Economics-Finance Seminar, Cal Poly SLO, January 25; Behavioral and Experimental Economics Workshop, UC Santa Barbara, February 8; University of Houston and Rice University joint Economics seminar, March 25; Texas A & M University, Economics Seminar, March 28; Economics-Finance Seminar, Baruch/CUNY, April 16.

"Social Dilemmas and Cultural Evolution," Anthropology Workshop, UCSC, October 8.

"Bubbles and Crashes and Cyborg Markets," Economics Seminar, Georgia State, November 7.

**2007:** "Networked Markets," Economics Department Seminar, University of Melbourne, April 17.

"Revealed Altruism," Economics Department Seminar, Monash University, April 18.

"Networked Markets," Economics Department Seminar, University of Sydney, April 26.

"A Laboratory Investigation of Deferral Options," Eleventh Annual International Conference on Real Options, UC Berkeley, June 8.

"Investment Timing and Preemption," plenary address, ESA Asia Pacific Meeting, Shanghai, August 3.

**2006:** "Revealed Altruism," Conference on Information and Incentives, UCSB, February 4.

"Revealed Altruism," UCSC brown bag Econ department seminar, April 6.

"Revealed Altruism," Econ Dept seminar, Harvard University, April 11.

"Tractable Altruism," Conference on Econometrics and Experimental Economics, Northwestern University, April 28.

"Revealed Altruism," Econ Dept seminar, University College London, May 25.

"Speculative Attacks," LEaF workshop, University College London, May 27.

"Bubbles and Crashes," Guest Lecture, Trento Summer School, July 18-19.

"Optimal Stopping: Theory and Experiment," ESA Regional Meetings, Tucson, September 30.

"Bubbles and Crashes," Econ Dept seminar, UC Davis, October 31.

"Bubbles and Crashes," Econ Dept seminar, Simon Fraser University, November 3.

Previous Seminar dates and titles available on request.

#### **CONFERENCE ORGANIZER:**

Economic Science Association North American Regional Conference: Tucson, November 2010; Tucson, November 2011; Tucson, November 2012; Santa Cruz, October, 2013. Also organized 3 ESA sessions at annual ASSA meetings 2011 – 2015.

Co-organizer (and co-founder) of annual Bay Area Behavioral and Experimental Economics Workshop 2010 - , and host 2010 and 2015.

#### **EDITORIAL BOARD:**

*American Economic Review* (2001 - 2007)

*Games and Economic Behavior* (2001 - present)

*Experimental Economics* (1998 - present)

*Journal of Evolutionary Economics* (1997 - present)

*Management Sciences* (special issue associate editor, 2010)

#### **REFEREE FOR:**

*American J. Political Science*

*Bollettino dell'Unione Matematica Italiana*

*Choice and Society*

*Econometrica*

*Economic Journal*

*European Economic Review*

*Games and Economic Behavior*

*J. Economic Behavior and Organization*

*Journal of International Economics*

*J. International Money and Finance*

*Journal of Political Economy*

*Management Sciences*

*National Science Foundation*

*Nature Communications*

*Proc National Academy of Science*

*Psychological Review*

*Journal of Economic Theory*  
*Journal of Economics and Business*  
*J. Econ. Dynamics and Control*  
*Journal of Economic Education*  
*Journal of Finance*

*Scandinavian Journal of Economics*  
*Science*  
*Review of Economic Studies*  
*Southern Economic Journal*

#### **ACADEMIC SOCIETY MEMBERSHIPS:**

American Economic Association  
 Econometric Society  
 Economic Science Association  
     North America Regional Vice President, 2010-14  
     Finance Section Head, 1999-2003  
 CESifo Senior Fellow, 1999-  
 Society for Mathematical Psychology 1997-2002

#### **COMMITTEE ASSIGNMENTS:**

2013 - : Chair, UCSC Committee on Planning And Budget  
 2011- 13 : UCSC Committee on Planning And Budget  
 2007- 10 : Chair, Economics Department Undergraduate Committee  
 2007- 10 : Chair, UCSC Institutional Review Board  
 2006 - : Technology and Information Management Advisory Committee;  
     0% appointment in TM Department from 2013.  
 2003- : TIM search committees  
 2006 -09 : Committee on Rules, Jurisdiction and Elections  
 2005-06 : Economics Search Committee Chair (Exp/Beh slot)  
 2003-06 : Committee on Research; Career Center Advisory Committee  
 2003-04 : I/O Search Committee (chair), ISTM Search Committee  
 1998-2001: Chair, Economics Department, UCSC  
 1993 - 97: Director, MS Program in Applied Economics and Finance, UCSC  
 1995 - 97: Chair, UCSC Social Science Division Computer Advisory Committee  
 1995 - 97: Chair, Advisory Board for UCSC Career Center  
 1997: Member, Public Policy and Organizational Science School Study Committee, UCSC  
 1993-94: Social Science Dean Search Committee Chair; Divisional Resource Review Committee  
 1992-93: Search Committee Chair; Graduate Committee; Divisional Computer Review Cmte.  
 1991: Acting Department Chair (June-August); Senior Search Committee Chair  
 1990: Business Administration Planning Study Committee, Office of the President (UC)  
 1990 - present: UCSC Human Subjects Committee/IRB  
 1989 - 1991: Crown College Executive Committee  
 1988 - 1990: Social Science Research Committee and Academic Senate Research Committee  
 1988: Social Sciences Dean Search Committee  
 1985 - 1994: UCSC Economics Board Graduate Committee; Recruiting Committees.  
 1985 - 1989: Chair, Economics Ph.D. Formation Committee and Seminar Committee, UCSC.  
 1979-82: at UCLA, served on the Graduate Committee in International Economics, various Field exam and award committees, a Tenure Review Committee, and 12 Doctoral Committees.

#### **THESIS SUPERVISION:**

**Undergraduate:** Supervised more than a dozen undergraduate thesis students at UCSC, of whom seven won major campus awards for undergraduate research since 1986.

**Graduate:** Supervised 1-3 MS theses per year 1985-2005 and served on one or more PhD thesis committees per year since 1994. Supervised the PhD dissertations of Scott Hood Melese D'Hospital in 1995, Carl Plat in 1996, Srijana Dhakwa in 1998, Hugh Kelley in 1999, Nicole

Bouchez in 2000, Alessandra Cassar in 2001; Matthew McGinty and Garrett Milam in 2002; Kai Pommerenke in 2005; Todd Feldman in 2009; Luba Petersen and Jean-Paul Rabanal in 2012; Ciril Bosch-Rosa in 2013; Jacopo Magnani in 2014; Curtis Kephart and Kevin McLaughlin in 2015.

#### **CLASSES TAUGHT:**

**Undergraduate:** Game Theory, Managerial Economics, Math-intensive Intermediate Microeconomics, Corporate Finance, Evolutionary Thought, Intermediate Microeconomics, Experimental Economics, International Finance, International Trade, Money and Banking, Principles.

**Graduate:** Microeconomic Theory, Evolutionary Game Theory, Financial Markets and Institutions, Applied Microeconomics, Corporate Finance, Mathematical Economics, Experimental Economics, International Trade and Finance

#### **CONSULTING REPORTS:**

"An Electronic Calendar Auction," with Alessandra Cassar, white paper prepared for Onedayfree, May 2000.

"On Electronic Market Making," memo prepared for Xerox PARC, March 1998.

"On the Valuation of Semiconductor Manufacturing Equipment," consulting for the Santa Clara County Assessor, 1991.

"Valuation Estimates for the Davenport Cement Plant," consulting for Santa Cruz County Assessor, January 1987.

"Alternative Market Structures for the Cement Industry," a report for RWC Associates (Anti-trust consulting), July 1983.

"Profitability of Foreign Exchange Trading," a technical report for Cashier's Division, Bank of America, July 1980.

Several technical reports to the International Money Policy Committee and the Money and Loan Policy Committee of the Bank of America, concerning macroeconomic and financial developments and risk management (e.g., proto-VaR estimates), 1977-1979.

"A Mathematical Model for Portfolio Fund Allocation," a technical report written for Thomte-Roper, Inc. (a commodities market investment firm), 1974.

#### **CONSULTING ACTIVITIES:**

November-December 2013: Consultant and Expert Witness for San Mateo County on the valuation of facilities in the biotechnology industry.

April-July 2007: Consultant for Solano County on the valuation of brewery facilities.

February-May 2006: Expert witness on U-Haul class action lawsuit.

November 2003- August 2004: Consultant for Kenney & Markowitz on personal injury cases.

November 2001-December 2007: Consultant and Expert Witness for San Mateo County on the valuation of facilities in the biotechnology industry and cable TV industries.

April 2004 - May 2005: retained by Reid, Axelrod, on a predatory pricing case.

April 2001: Consultant for Reid, Axelrod, on a personal injury case.

February 2001: Consultant for Rucka, O'Boyle on a personal injury case.

April-May 2000: Consultant to Onedayfree on electronic auction formats.

January-February 2000: Expert Witness for Reid, Axelrod, on personal injury case.

January 2000: Consultant for Pennie & Edmonds LLP on Priceline.com case.

February-April 1999: Consultant to Center for Adaptive Systems Applications (CASA), Los Alamos.

January - March 1998: Consultant to Xerox PARC on electronic commerce.

November 1996 - June 1998: Consultant for Alameda, Santa Clara and San Diego Counties on the valuation of facilities in the aerospace industry and the waste management industry.

July 1993 - March 1994: Consultant for Santa Cruz County on the valuation of local cable TV operations. Testified as an expert witness before the County Appeals Board.

October 1993: Consultant to Pacific Telephone Co. on Spectrum (PCS) Auctions.

June 1991 - October 1994: Principal consultant for Santa Clara County on the valuation of semiconductor manufacturing equipment. Testified as an expert witness in the Apple, Intel and AMD assessment appeals and in hearings before the State Board of Equalization.

October 1986 - February 1987: Principal consultant for Santa Cruz County on valuation of cement industry facilities. Testified as an expert witness in the Lonestar assessment appeals hearing.

July 1983: Consultant for RWC Associates, an economics consulting firm retained by the plaintiffs in a cement antitrust case. Reviewed the data and analytical procedures and wrote a background report on the nature of competition in the Portland cement industry.

May 1983: Consultant for RWC Associates, retained by Sprigg's heirs in the case Spriggs vs. Coors. Helped develop an approach to assess damages.

July-August 1980: External Consultant to Bank America Corporation. Analyzed the profitability and risk of their corporate-wide foreign exchange operations.

March-May 1973: Consultant to Thomte-Roper, Inc., a commodities market investment firm. Analyzed the overall risk of their activities and suggested more efficient asset allocation rules.

### **WORK IN PROGRESS:**

[under recent journal review]

"Estimating Payoff Matrices from Time Series Data: The Case of the Lizard Rock-Paper-Scissors Oscillator," with Dhanashree Paranjpe, Jacopo Magnani and Barry Sinervo, February 2014.

"Survivor curve shape and internet revenue: A laboratory experiment," with Christina Aperjis, Ciril Bosch and Bernardo Huberman, February 2015.

"An Experiment on a Core Controversy," with Huibin Yan, January 2012.

[drafts in limited circulation]

"Tradable Fishing Rights: A Laboratory Investigation," with Ryan Oprea, Daniel Somers and Jon Sutinen, 2008.

"Risky Curves: From Unobservable Utility to Observable Opportunities," with Shyam Sunder, May 2011.

"Evolving Landscapes for Population Games," with Joel Yellin, February 1997.

[in preparation]

*Evolutionary Games in Nature, Computers and Society*, with Barry Sinervo. Under contract with Oxford University Press.

"A Dynamic Model of Religious Fundamentalism," with Jonathan Gair, Sriya Iyer and Chander Velu.

"Landscape Dynamics" with Daniel Ostrov.

"Insurgency: A Real-Time Laboratory Study," with Ryan Oprea

"Homotopies of Weakest Link Games in the Laboratory," with Thomas Campbell and Matt Baumer

"Corporate Culture in the Laboratory," with Nirvikar Singh

"Mixed Strategy Nash Equilibrium in Constant Sum Games," with Ryan Oprea and Nat Wilcox

"How moral codes evolve in a trust game," with Jean Paul Rabanal