

# William H. Sandholm

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## Education

Ph.D., 1998, Kellogg Graduate School of Management, Northwestern University.  
A.B., 1992, Dartmouth College. Summa cum laude.

## Appointments

Professor of Economics, University of Wisconsin, 2005 to present.  
Associate Professor of Economics, University of Wisconsin, 2002-2005.  
Assistant Professor of Economics, University of Wisconsin, 1998-2002.

## Fellowships and Awards

National Science Foundation Grant (“Evolutionary Game Theory and Applications”), 2009-2012.  
Davies Fellow in Economics, University of Wisconsin, 2008-2009.  
Romnes Faculty Fellowship, University of Wisconsin, 2006-2011.  
National Science Foundation Grant (“Rationality, Irrationality, and Transition Dynamics in Evolutionary Game Theory”), 2006-2009.  
National Science Foundation CAREER Award (“Evolution in Games: Theory and Applications”), 2001-2006.  
McKenzie Prize for Excellence in Economic Research, University of Wisconsin, 2002.  
Graduate School Research Award, University of Wisconsin, 2001-2002 and 2006-2007.  
Shoemaker Fellow in Economics, University of Wisconsin, 1998-2000 and 2002-2004.  
Doctoral Teaching Award, Northwestern University, 1997-1998.  
State Farm Companies Foundation Dissertation Fellowship, 1997-1998.  
National Science Foundation Graduate Fellowship, 1993-1996.  
AACSB/GMAC National Doctoral Fellowship in Business and Management, 1992-1993.

## Research

### Articles in refereed journals

- "Orders of Limits for Stationary Distributions, Stochastic Dominance, and Stochastic Stability." Forthcoming, *Theoretical Economics*.
- "Large Population Potential Games." *Journal of Economic Theory* 144 (2009), 1710-1725.
- "Stable Games and their Dynamics" (with Josef Hofbauer). *Journal of Economic Theory* 144 (2009), 1665-1693.
- "Cultural Integration and Its Discontents" (with Timur Kuran). *Review of Economic Studies* 75 (2008), 201-228.
- "The Projection Dynamic and the Geometry of Population Games" (with Ratul Lahkar). *Games and Economic Behavior* 64 (2008), 565-590.
- "The Projection Dynamic and the Replicator Dynamic" (with Emin Dokumaci and Ratul Lahkar). *Games and Economic Behavior* 64 (2008), 666-683.
- "Robust Permanence and Impermanence for Stochastic Replicator Dynamics" (with Michel Benaïm and Josef Hofbauer). *Journal of Biological Dynamics* 2 (2008), 180-195.
- "Evolution in Bayesian Games II: Stability of Purified Equilibrium." *Journal of Economic Theory* 136 (2007), 641-667.
- "Simple Formulas for Stationary Distributions and Stochastically Stable States." *Games and Economic Behavior* 59 (2007), 154-162.
- "Evolution in Games with Randomly Disturbed Payoffs" (with Josef Hofbauer). *Journal of Economic Theory* 132 (2007), 47-69.
- "Pigouvian Pricing and Stochastic Evolutionary Implementation." *Journal of Economic Theory* 132 (2007), 367-382.
- "Excess Payoff Dynamics and Other Well-Behaved Evolutionary Dynamics." *Journal of Economic Theory* 124 (2005), 149-170.
- "Evolution in Bayesian Games I: Theory" (with Jeffrey C. Ely). *Games and Economic Behavior* 53 (2005), 83-109.
- "Negative Externalities and Evolutionary Implementation." *Review of Economic Studies* 72 (2005), 885-915.
- "Evolution and Equilibrium under Inexact Information." *Games and Economic Behavior* 44 (2003), 343-378.
- "On the Global Convergence of Stochastic Fictitious Play" (with Josef Hofbauer). *Econometrica* 70 (2002), 2265-2294.
- "Evolutionary Implementation and Congestion Pricing." *Review of Economic Studies* 69 (2002), 667-689.
- "Almost Global Convergence to  $p$ -Dominant Equilibrium." *International Journal of Game Theory* 30 (2001), 107-116.
- "Preference Evolution, Two-Speed Dynamics, and Rapid Social Change." *Review of Economic Dynamics* 4 (2001), 637-679.
- "Potential Games with Continuous Player Sets." *Journal of Economic Theory* 97 (2001), 81-108.
- "Evolution, Population Growth, and History Dependence" (with Ady Pauzner), *Games and Economic Behavior* 22 (1998), 84-120.

"History Independent Prediction in Evolutionary Game Theory." *Rationality and Society* 10 (1998), 303-326.

"Simple and Clever Decision Rules in a Model of Evolution." *Economics Letters* 61 (1998), 165-170.

#### Articles in edited volumes

"Evolutionary Game Theory." In R. A. Meyers, ed., *The Encyclopedia of Complexity and System Science*. Springer, 2009.

"Deterministic Evolutionary Dynamics." In S. N. Durlauf and L. E. Blume, eds., *The New Palgrave Dictionary of Economics*, 2nd edition, vol. 2, 457-461. Macmillan, 2008.

"Learning and Evolution in Games: Overview". In S. N. Durlauf and L. E. Blume, eds., *The New Palgrave Dictionary of Economics*, 2nd edition, vol. 5, 56-60. Macmillan, 2008.

#### Software

*Dynamo: Phase Diagrams for Evolutionary Dynamics* (with Emin Dokumaci).

#### Book reviews

"*Strategic Learning and its Limits* by H. Peyton Young." *Games and Economic Behavior* 63 (2008), 417-420.

"*Evolutionary Dynamics and Extensive Form Games* by Ross Cressman." *International Review of Economics and Finance* 15 (2006), 136-140.

#### Contributions to conference proceedings

"Evolutionary Game Dynamics with Migration for Hybrid Power Control in Wireless Communications" (with Hamidou Tembine, Eitan Altman, and Rachid El Azouzi). *Proceedings of the 47th IEEE Conference on Decision and Control*, December 2008.

"Stable Games" (with Josef Hofbauer). *Proceedings of the 46th IEEE Conference on Decision and Control*, December 2007.

#### Book draft

*Population Games and Evolutionary Dynamics*. To be published by MIT Press.

#### Working papers

"Decompositions and Potentials for Normal Form Games."

"Local Stability under Evolutionary Game Dynamics." Under revision, *Theoretical Economics*.

"Pairwise Comparison Dynamics and Evolutionary Foundations for Nash Equilibrium." Under revision, *International Journal of Game Theory*.

"A Probabilistic Characterization of Integrability for Game Dynamics."

"Schelling Redux: An Evolutionary Dynamic Model of Segregation" (with Emin Dokumaci).

"Stochastic Evolution with Perturbed Payoffs and Rapid Play" (with Emin Dokumaci).

"Survival of Dominated Strategies under Evolutionary Dynamics" (with Josef Hofbauer). Under revision, *Review of Economic Studies*.

## Work in progress

“Exponential Protocols and Large Population Potential Games.”

“Logit Evolution in Potential Games: Reversibility, Rates of Convergence, Large Deviations, and Equilibrium Selection” (with Michel Benaïm).

“Sampling Best Response Dynamics and Iterated  $p$ -Dominance” (with Daisuke Oyama and Olivier Tercieux).

“Stochastic Imitative Dynamics with Committed Agents.”

“Supermodular Bayesian Population Games and Applications” (with Laurent Mathevet).

## Professional Activities

### Short-term appointments

Visiting Professor, Stockholm School of Economics, various dates.

National Science Foundation Panelist (Economics), 2006-2008.

Visiting Scholar, University of Avignon and INRIA, November 2007.

Visiting Scholar, University of Vienna, November 2006.

Visiting Scholar, University of Paris VI, November 2006.

National Science Foundation Panelist (Human and Social Dynamics), 2004.

Visiting Scholar, University of Southern California Law School, March 2003.

Visiting Scholar, University of Tokyo, June 2002.

### Editorial positions

Advisory Editor, *Games and Economic Behavior*, 2009 to present.

Associate Editor, *International Journal of Game Theory*, 2008 to present.

Associate Editor, *Journal of Economic Behavior and Organization*, 2004 to present.

Associate Editor, *Journal of Economic Theory*, 2005 to present.

### Conference program committees

Symposium on Algorithmic Game Theory, 2008.

### Refereeing

Government agencies: Social Sciences and Humanities Research Council of Canada, Israel Science Foundation, Economic and Social Research Council (UK), National Science Foundation (USA), Portuguese Foundation for Science and Technology.

Journals: *AEJ Microeconomics*, *American Economic Review*, *Applied Mathematics Letters*, *B.E. Journals in Theoretical Economics*, *Econometrica*, *Economic Theory*, *European Economic Review*, *European Journal of Operations Research*, *Games and Economic Behavior*, *International Economic Review*, *International Game Theory Review*, *International Journal of Game Theory*, *Journal of Economic Behavior and Organization*, *Journal of Economic*

*Dynamics and Control, Journal of Economic Surveys, Journal of Economic Theory, Journal of Machine Learning Research, Journal of Public Economics, Journal of the ACM, Journal of the European Economic Association, Mathematical Social Sciences, Mathematics of Operations Research, Rationality and Society, Review of Economic Studies, Ricerche Economiche, Scandinavian Journal of Economics, Theoretical Economics, Theoretical Population Biology, Theory and Decision, Theory of Computing Systems.*

### Conference presentations and seminars

- 2009: Army Research Office Workshop on Decision Sciences; UW-Madison Mathematics; Econometric Society Winter Meeting.
- 2008: Toulouse School of Economics; Paris Game Theory Seminar; CEPR-PSE Conference on Cultural Dynamics and Diversity; GWU Symposium on Statistical, Mathematical, and Computational Sciences; University of Texas; UCLA; MIT Workshop on Game Theory and Networked Control Systems; Third World Congress of the Game Theory Society; UCSD; Caltech Workshop on Microeconomic Dynamics; Oxford University; Johns Hopkins University.
- 2007: IEEE Conference on Decision and Control; Brown University; University of Avignon; Caltech; UNC-Charlotte; UW-Madison Complex Systems.
- 2006: University of Michigan; Institute for Advanced Study, Vienna; University of Vienna; University of Bonn; Paris Game Theory Seminar; Radcliffe Seminar on Dynamic Networks; Columbia University; University of Western Ontario; UC-Berkeley; Stony Brook International Game Theory Conference; Banff Workshop on Evolutionary Game Dynamics; Princeton University; Caltech Learning and Information Workshop; Econometric Society Winter Meeting.
- 2005: Pennsylvania State University; Concordia University; Ninth World Congress of the Econometric Society; Stockholm School of Economics; SIAM Conference on Optimization.
- 2004: Harvard Program for Evolutionary Dynamics; Yale University; Kyoto Game Theory Workshop.
- 2003: UW-Madison Mathematics; Illinois Conference on Learning and Bounded Rationality; Virginia Tech; University of Chicago; Princeton University; Johns Hopkins University; Washington University in St. Louis; Econometric Society Summer Meeting; University of Texas; UCLA; University of Southern California.
- 2002: University of Pennsylvania; Harvard University; Society for Economic Dynamics Summer Meeting; University of Tokyo; Royal Institute of Technology, Stockholm; Stockholm School of Economics; Case Western Reserve University Learning Conference; Cornell University; Econometric Society Winter Meeting.
- 2001: Stony Brook International Game Theory Conference; Valencia International

- Game Theory Conference; Midwest Economic Theory Meeting.
- 2000: Royal Institute of Technology, Stockholm; Stockholm School of Economics; Eighth World Congress of the Econometric Society; First World Congress of the Game Theory Society; American Economic Association Annual Meeting.
- 1999: Northwestern University; Stony Brook International Game Theory Conference.
- 1998: University of Michigan; University of Wisconsin; Columbia University, California Institute of Technology; University of Chicago; Kennedy School of Government-Harvard University.
- 1997: University of Rochester; Washington University in St. Louis; Arne Ryde Symposium on Focal Points, Lund University; Stony Brook International Game Theory Conference.
- 1996: Summer in Tel-Aviv Economic Theory Conference.

## Advising and Teaching

### Ph.D. students

Emin Dokumaci (2007), Ratul Lahkar (2007), Yasushi Asako (2009), Fernando Louge (2009), Wei Zhang (2009), Ignacio Monzón (current), Michael Rapp (current), Danqing Hu (current), Katsuhiko Aiba (current), Ryoji Sawa (current), Dai Zusai (current).

### Graduate teaching

Game theory, microeconomic theory, dynamical systems, stochastic processes.

### Undergraduate/MBA teaching

Probability and statistics.

### Book draft

*Vital Statistics: Probability and Statistics for Economic and Business Decisions* (with Brett A. Saraniti). To be published by Pearson/Addison-Wesley.