

Week 3: Complexity: Diversity, Networks, Adaptation, and Emergence

Lead: Scott E. Page

Guest faculty: Jenna Bednar, James Fowler and Ken Kollman

Monday July 3: Conceptual Intro and Tool Development

Morning Assemblage: 9:00-11:45

- The Interest in Between

- Miller, John H. and Scott E Page (2004) “The Standing Ovation Problem *Complexity*, Vol. 9, No. 5, May/June pp. 8-16.

- Page, Scott E (2006) Agent Based Models *The New Palgrave Dictionary of Economics Complex Adaptive Social Systems: The Interest in Between* Princeton University Press (forthcoming).

- Page, Scott (1999) “Computational Models from A to Z” *Complexity* Vol. 5 No. 1 pp 35-41.

Lunch: 11:45-1:15

Afternoon Session 1:15 -4:45

- NET LOGO: An Introduction 1:15 -2:15

- <http://ccl.northwestern.edu/netlogo/>

- Modeling Project Assignments: 2:30-3:00

- *A Simple and Fun Project*: Due Wednesday am

- *A Real Project (also fun)* Due Friday noon:

- “The Art and Science of Modeling”: Open Discussion 3:30-4:45

- Leombruni, R. and Richiardi, M. (2005). Why are economists sceptical about agent-based simulations? *Physica A* 355, pp. 103-109.

Tuesday July 4: Fireworks

July 5: Classic Ideas and Models

Morning Encounter 9:00-11:45

- Homework Presentations 9-10

- Classic Ideas and Models from Complex Systems 10:15 -11:45

- Cellular Automata: Page, Scott. (1997). On Incentives and Updating in Agent Based Models.” *Computational Economics*: 10 pp 6787.

- Culture Model: Axelrod, R. 1997 "The Dissemination of Culture: A Model with Local Convergence and Global Polarization," *Journal of Conflict Resolution*, 41, pp. 203-26.
- Tipping: Schelling, Thomas (1978) *Micromotives and Macrobehavior*. pp. 147-165, Norton, New York.
- Learning: Holland, John. (1992). "Genetic Algorithms." *Scientific American*. July. pp. 66-72.
- Simulated Annealing: Page, Scott (1996) "Two Measures of Difficulty." *Economic Theory* 8: 321–346.

Lunch: 11:45-1:15

Early Afternoon Get Together 1:15-2:45 Instructor: Jenna Bednar

- Modeling Culture:
 - Bednar, Jenna and Scott E Page (2005) "Can Game(s) Theory Explain Culture? The Emergence of Cultural Behavior within Multiple Games" *Rationality and Society* (forthcoming).
 - Henrich, Joseph, Robert Boyd, Samuel Bowles, Colin Camerer, Ernst Fehr, Herbert Gintis, and Richard McElreath. 2001. "In Search of Homo Economicus: Behavioral Experiments in 16 Small-Scale Societies." *The American Economic Review* 91(May 2001), pages 73-78.

Late Afternoon Reunion: 2:30-4:45

- Finish up Classic Ideas and Models: 2:30 -3:30
 - **Path Dependence** Page S.E. (2006) "Path Dependence", *Quarterly Journal of Political Science*: Vol. 1:No. 1, pp 87-115.
 - **Stability and Attainability** Notes to be handed out
- "How do I apply these ideas?" Open Discussion 3:45-4:45 (Perhaps to be held at a secret location)

July 6: Elections, Networks, and Information

Morning Conclave: 9:00-11:45 Instructor: Ken Kollman

- Models of Adaptive Parties in Elections
 - Kollman, Ken, John Miller, and Scott Page (1992) "Adaptive Parties in Spatial Elections," *American Political Science Review*, 86: 929–37.
- Complex Systems and Institutions
 - Kollman, Ken and Scott Page (2006) *Computational Political Economy Handbook of Computational Economics* Leigh Tesfatsion and Ken Judd (eds) North Holland forthcoming.
- Empirical Testing of Agent Based Models

- Laver, M. (2005) “Policy and the dynamics of political competition.” *American Political Science Review* 99:2 (May) 263-281.

Lunch: 11:45-1:15

Afternoon Congregation: 1:15-4:45

- Networks
 - Newman, M J 2003 “The Structure and Function of Complex Networks”, *SIAM Review*, 45, 167-256.
 - The Small World of the American Corporate Elite: 1991-2001, Gerald F. Davis, Mina Yoo, and Wayne E. Baker, (2003) *Strategic Organization* Vol. 1, No. 3, pp. 301-326.
- Information and Predictive Models
 - Page, Scott E (2006) Chapters 5 and 6 of *Thinking Differently: How our individual differences produce collective benefits* Princeton University Press (forthcoming).

Evening Rap Session 7:45-? TBA

July 7: Empirical Testing and Participant Models

Morning Confab 9:00-11:45 Instructor: James Fowler

- Testable implications of Network Theory
 - Fowler, James (2006) “Connecting the Congress: A Study of Cosponsorship Networks,” forthcoming in *Political Analysis*.
 - Fowler, James, Timothy R. Johnson, James F. Spriggs II, Sangick Jeon, and Paul J. Wahlbeck (2006) “Network Analysis and the Law: Measuring the Legal Importance of Supreme Court Precedents” (manuscript).

Lunch: 11:45-1:15

Afternoon Convocation: 1:15-4:30

- Presentation of Participant Models