POSC 330: The Complexity of Politics
Monday & Wednesday: 1:50 to 3:35
Weitz Center 235
Instructor: Greg Marfleet
Office: Weitz Center 239b
Office hours: Tuesday and Thursday 2:00 to 4:30
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Theories of complexity and emergence relate to how large-scale collective properties and characteristics of a system can arise from the behavior and attributes of component parts. This course explores the relevance of these concepts, studied mainly in physics and biology, for the social sciences.
Readings and seminar discussion topics may include conflict and cooperation in international and sub-national environments, electoral competition, cross-cultural contact and the transmission of cultural traits, models of group interactions and decision making and social networks
Over the term we will experientially explore agent-based modeling to discover emergent properties of social systems through computer simulations created using NetLogo software. A series of workshops will build the requisite skills to complete the programming project which constitutes the main graded assignment for the class.
This course is organized in a combination seminar/workshop format. Monday meetings will begin with a discussion of the listed readings. Students will be assigned roles as discussants and will be asked to generate 3 or 4 discussion questions per reading. For the second day of the week we will shift our focus to NetLogo programming and we will discuss assignments that are 'in progress' and you can raise any questions or problems you are having.
Our class will take place in the new Weitz Center for Creativity. Incoporated into this new building is an innovative new classroom facility modeled after the "SCALE - UP" classroom pioneered at NC State Univeristy http://scaleup.ncsu.edu/

Books
· Axelrod, Robert. 1997. The Complexity of Cooperation. Princeton University Press: Princeton NJ.
· Miller , John H. and Scott E. Page . 2007. Complex Adaptive Systems: An Introduction to Computational Models of Social Life. Princeton University Press: Princeton, NJ.
Readings
All Readings are available via links on this page or in pdf, doc, or html format in the COURSES/Course Materials folder

Netlogo Modelling Software :
Find it Here

Grading Scheme

Component	Pts
Participation in Seminar (includes discussion question prep)	20
Workshop Assignments	25
Model Proposal Paper	25
Final Project	30
TOTAL	100

WEEKLY TOPIC AND READING OUTLINE

September 11 - September 17
Complexity; An IR centered Introduction
Monday
 Miller and Page, CAS Chapter 1
 Axelrod TCofC Introduction
 SCALEUP Activity: NetLogo Tutorials #1 and #2
Wednesday
Hamman, Henry (1998) "Remodeling International Relations: New Tools from New Science" Chapter 8 in
International Relations in a Constructed World, Kubalkova, Onuf and Kowert Eds. Armonk, NY: M. E.
Sharpe.
 SCALE-UP Activity: NetLogo Tutorial #3 begin WS1
 Workshop #1 Assignment

September 18 - September 24
 Monday - Agent Based Models, Complex Adaptive Systems and Emergence
 Rauch, Jonathan. 2002. "Seeing Around Corners." The Atlantic Monthly.
 Miller and Page, CAS, Chapter 3 & 4 (see the Game of Life Link)
 Joshua M. Epstein. 2008. Why Model? Journal of Artificial Societies and Social Simulation vol. 11, no. 4 1
 SCALEUP Activity: Explore the Social Segregation and Sugar Scape Models models in the models library.
Make a simple flowchart.
 Wednesday - Self-Organization and Co-Evolution
 Gregory G. Brunk. 2001. Self-Organized Criticality: A New Theory of Political Behaviour and Some of Its
Implications. British Journal of Political Science, Vol. 31, No. 2 pp. 427-445.
 Lansing, Stephen J. 2002. "'Artificial societies' and the social sciences", Artificial Life, v.8 n.3, p.279-292,
2002
 SCALEUP Activity: Explore the Game of Life and Daisy World Models begin WS #2. More flowcharting.
 Game of Life file
Workshop #2 Assignment

September 25 - October 1
 Monday - Fitness, Selection and Adaptation
 Miller and Page Chapter 5 & 6
 Axelrod, Robert. 1997. The Complexity of Cooperation. Chapters 1 & 2
 Arthur, W. Brian. (1994). Inductive reasoning and bounded rationality. American Economic Review
84:406-411.
 SCALEUP Activity : Explore the El Farol bar model
 Wednesday -- Games Agents Play
 Miller and Page Chapter 7 & 10
 Bednar, Jenna and Scott Page, "Game(s) Theory and Culture." see Jenna Bednar's web site http://www-
personal.umich.edu/~jbednar
 Miller, John H. 1996. "The Coevolution of Automata in the repeated prisoner's dilemma" JEBO. 29:87-
112
 SCALEUP Activity:Explore the spatial PD Moore Machine Model begin WS #3

October 2 - October 8
 Monday - Early Computer Simulations of World Politics

Bremmer, Stuart A. and Micheal Mihalka. 1977. "Machiavelli in Machina: Or politics among Hexagons" in Karl Deutsch, Bruno Fritsch, Helio Jaguaribe and Andrei S. Markovits Problems of World Modeling: Political and Social Implications. Ballinger: Cambridge, MA.

Stoll, Richard. 1987. "System and State in International Politics: A Computer Simulation of Balancing in an anarchic world". International Studies Quarterly 31:4 (December 1987), pp. 387 402.

Axelrod, Robert. 1997. The Complexity of Cooperation. New York: Ch. 4 (alliances)

Axelrod, Robert. 1997. The Complexity of Cooperation. New York: Ch. 6 (empires)

SCALEUP Activity: Explore NetLogo Landscape model begin WS#4

Wednesday - IR models continued

Simon, Marc and Harvey Starr. 1996. "Extraction, Allocation and the Rise and Decline of States: A simulation analysis of two-level security management" Journal of Conflict Resolution 40, 2: 272-297.

Cederman, Lars-Eric. 2003. "Modeling the Size of Wars: From Billiard Balls to Sandpiles" American Political Science Review. 97, 1:135-150

Lars-Erik Cederman. 2001. Modeling the Democratic Peace as a Kantian Selection Process. Journal of Conflict Resolution, Vol. 45, No. 4, 470-502.

Miller and Page Chapter 2 & 8

SCALEUP Activity: Continue WS#4

Workshop #4 Assignment

October 9 - October 15

Monday - Modeling Societies in Conflict

Lustick, Ian S., Dan Miodownick and Roy Eidelson. 2004. "Secessionism in Multicultural States: Does Sharing Power Prevent or Encourage It? American Political Science Review, 98, 2 pp: 209-229.

Bhavnani, Ravi and David Backer 2000. Localized Ethnic Conflict and Genocide: Accounting for Differences in Rwanda and Burundi. The Journal of Conflict Resolution. 44, 3: pp. 283-306.

Epstein, Joshua M., John D. Steinbruner, Miles T. Parker 2001 "Modeling Civil Violence: An Agent-Based Computational Approach" CSED Working Paper No. 20
http://www.brookings.edu/es/dynamics/papers/cviolence/cviolence.pdf

SCALEUP Activity: Explore Genocide Model, Major Project Group Brainstorming

Wednesday

SCALEUP Activity: Proposal Workshop -- Bring to class a short Power Point of not more than 6 slides that outlines up to 3 possible model ideas you have. Describe each model (keep it brief -- no more than a few bullet points) and identify: a) what question you are interested in exploring, b)what type of model this is (heuristic? etc.), c) who the agents are and how might they behave, d) who or what might they interact with and e) what outcomes you could look for. Don't worry excessively about codeability (yet). Definielty consider diagraming your ideas!

This PPT should accompany you to class AND be uploaded to the link below as Workshop 5. You will be expected to discuss your model ideas with your group and the a few of you with the class as a whole. Your preparedness for this exercise will be noted and reflected in your participation grade.

Workshop #5 Assignment

October 16 - October 22

Monday - Mid Term Break

Wednesday - Emergent Norms and Social Movements

Axelrod, Robert. 1997. The Complexity of Cooperation. New York Ch. 3

Hoffman, Matthew J. (2000) "Exploring Norm Emergence and Evolution with Agent-Based Models" APSA paper, Washington DC.

David Brichoux and Paul E. Johnson (2002) The Power of Commitment in Cooperative Social Action, Journal of Artificial Societies and Social Simulation vol. 5, no. 3
 Miller and Page Chapter 9
 SCALEUP Activity: Explore the Multi-state Metanorm and guess a number game
 NOTE: Your Model Proposal Paper is due Today before class.
 Model Proposal Paper Assignment

October 23 - October 29
 Monday -- Guerrillas and Insurgency
 D. Scott Bennett. 2008. Governments, Civilians, and the Evolution of Insurgency: Modeling the Early Dynamics of Insurgencies. Journal of Artificial Societies and Social Simulation vol. 11, no. 4 7
 Scott Wheeler. 2005. It Pays to Be Popular: a Study of Civilian Assistance and Guerrilla Warfare. Journal of Artificial Societies and Social Simulation vol. 8, no. 4
 Chaturvedi, A. R., D. Dolk, R Chaturvedi, M. Mulpuri, D. Lengacher, S. Mellema, P. Poddar, C. Foong, and B. Armstrong (2005) Understanding Insurgency by Using Agent-Based Computational Experimentation: Case Study of Indonesia." Proceedings of the Agent 2005 Conference on Generative Social Processes, Models, and Mechanisms.
 Doran, Jim. (2005) Iruba: An Agent-Based Model of the Guerrilla War Process. In Klaus Troitzsch, ed. Representing Social Reality: Pre-Proceedings of the Third Conference of the European Social Simulation Association, Koblenz, September 5-9, 2005. Germany: Verlag Dietmar Fölbach, pp. 198-205.
 SCALEUP Activity: Exploring an Insurgency models, gathering data from a model
 Wednesday -- Social Networks and Terrorism
 Rob Stocker, David Cornforth and T. R. J. Bossomaier (2002). Network Structures and Agreement in Social Network Simulations. Journal of Artificial Societies and Social Simulation vol. 5, no. 4
 Michael Genkin & Alexander Gutfraind. 2007. How Do Terrorist Cells Self-Assemble? Insights from an Agent-Based Model. SSRN
 Raczynski, S. 2004. "Simulation of the Dynamic Interactions between Terror and Anti-Terror Organizational Structures." Journal of Artificial Societies and Social Simulations 7,2.
 SCALEUP Activity: Modifying a Model
 Bennet Insurgency Model (my version) file
 Three Types of Attachment Model file

October 30 - November 5
 Monday -- Political Institutions and Elections
 Buckley, Jack and Scott Graves. 2001. Growing Congress: Using Agent-based Computational Modeling to Develop Theories of Legislative Behavior, Learning and Organization. Paper presented for the annual meeting of the Southern Political Science Association
 Kollman, Ken, John Miller, and Scott Page. 1998. "Political Parties and Electoral Landscapes." British Journal of Political Science 28: 139-58.
 Scott Page. 1999. On the Emergence of Cities. Journal of Urban Economics, 45, 184.208.
 SCALEUP Activity: Exploring Model Sensitivity
 Wednesday -- Identities and Nationalism
 Bhavani, R. 2003. "Adaptive Agents, Political Institutions and Civic Traditions in Modern Italy." Journal of Artificial Societies and Social Simulation vol. 6, no. 4.
 van der Veen, A. Maurits. 2002. The Emergence of a European Identity: Modeling International Experiences. Presented at the American Political Science Association Annual Meeting in Boston, MA.
 Axelrod, Robert. 1997. The Complexity of Cooperation. New York. Ch 7

SCALEUP Activity: Considering Model Validation

November 6 - November 12
 Model Presentation Schedule Resource
 Monday Group and Organizational Decision Making
 Miller and Page Chapter 11 and 12
 Guillaume Deffuant, Frédéric Amblard, Gérard Weisbuch and Thierry Faure (2002). How can extremism prevail? A study based on the relative agreement interaction model. Journal of Artificial Societies and Social Simulation vol. 5, no. 4 http://jasss.soc.surrey.ac.uk/5/4/1.html
 Ron Sun and Isaac Naveh (2004)Simulating Organizational Decision-Making Using a Cognitively Realistic Agent Model Journal of Artificial Societies and Social Simulation vol. 7, no. 3 http://jasss.soc.surrey.ac.uk/7/3/5.html
 Wednesday
 Project Presentations (group A)

November 13 - November 19
Monday
Project Presentations (group B)
Wednesday
Project Presentations (group C)

November 20 - November 26
 FINAL PROJECT DUE - 5PM LAST DAY OF EXAMS Assignment