

Society in Silico

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Weekly outline

- **General**

Time: 2a: MW 10:00-11:10, F 9:50-10:50 (except week 1)

Location: F2F Classes in Weitz 235 on Monday and Wednesday (except Week 1)

Instructor: Greg Marfleet, Willis 406, 222-4116

Office Hours: Monday & Wednesday Evenings on Zoom 7:30pm to 9:30pm

Greg's Google Calendar Appointment Page [[link here](#)]

Greg's Zoom Room [[link here](#)] note you MUST be logged into Zoom using your Carleton ID / Account

Description:

Can models help us understand the social world? Vexing issues like segregation, economic inequality, corruption market failure, resource over-exploitation, genocide, insurgency and terrorism have inspired scholars to ask if computational models of social systems can shed light on the hard-to-observe micro processes underlying macro problems.

In this course we will explore the conceptual and empirical foundations of modeling especially in complex systems. We will read about, then experiment with, existing models while students learn to program their own using open-source software.

Texts: None, this is an article-based course. See below for readings each week

Software: NetLogo -- an open source agent-based modeling platform is [available for download here](#)

Assignments:

Model Experiment Papers (x2) 10 pts each -- 20 pts

Final Project Model Modification and Analysis Paper (including rewrite) -- 25 pts

Group Coding Project and Presentation -- 13pts

Weekly Code Lab Exercises (x6) 2 pts each -- 12pts

Weekly Model Reading Quiz (x7) 2 pts each -- 14pts

Weekly Topical Readings Student Generated Discussion Questions (x8) 2 pts each -- 16pts

- **Assignments Choices & Submission Uploads**

-  Model Experiment Paper Choice

-  First Model Experiment Paper Assignment

-  Second Model Experiment Paper Assignment

-  Model Modification and Analysis Paper (Draft) Assignment

-  FINAL PAPER UPLOAD Assignment

Upload the final corrected and edited version of your paper by the end of the exam period which is 9:30pm Monday November 23rd.

You MUST also upload your final NetLogo Modification Model code.

-  Monday Model Reading Quiz upload Assignment

Each Monday (except midterm) we will read a modelling article. As part of the 'reading for depth and comprehension' aspect to this A&I class there will be a quiz posted. Complete the quiz and upload it to this link (you can upload at least 7 files).

-  Weekly Code Lab Upload Assignment

Each Wednesday we will practice coding in NetLogo. Guides with starter code are posted for each of these classes. Your assignment is to get the basic code working AND then tweak it in some small fashion to "make it your own". At first, this might mean simply changing colors, adding sliders or graphs. Later I'll expect to see some more adventurous efforts.

This upload link will accept up to 8 files. Be sure to give each model a name that I can recognize for that week (ex. myepidemic.nlogo or mygameoflife.nlogo)

- **13 September - 19 September**

- Monday - ZOOM DISCUSSION

Introductions, Course Outline and plan

Considering the Liberal Arts

Readings:


Liberal Arts Goals

Cronon, W., 1998. " Only Connect..." The Goals of a Liberal Education. *The American Scholar*, 67(4), pp.73-80.

Nussbaum, M.C., 1998. *Cultivating humanity*. Harvard University Press. Excerpted in Liberal Education Spring 1998

How Models, Theory and Observation Intersect:

Epstein, J.M., 2008. Why model?. *Journal of Artificial Societies and Social Simulation*, 11(4), p.12.

-  Discussion Questions for Cronon and Nussbaum File Uploaded 13/09/20, 19:13
- Wednesday - IN CLASS LAB, Working with NetLogo, Behavior Space [ALWAYS BRING YOUR LAPTOP TO CLASS ON MONDAY AND WEDNESDAY]

Activites: Intro to Netlogo Tutorials #1, #2, #3, Getting Data

- Friday - ZOOM DISCUSSION

Society, Culture and Epidemics


Readings:

OLGA KHAZAN. The Most American COVID-19 Failure Yet. Contact tracing works almost everywhere else. Why not here? *The Atlantic*. AUGUST 31, 2020

EDOARDO CAMPANELLA. The Bubonic Plague Killed Feudalism. COVID-19 Will Entrench It. *Foreign Policy*. AUGUST 20, 2020.

WADE DAVIS. The Unraveling of America. Anthropologist Wade Davis on how COVID-19 signals the end of the American era. *Rolling Stone*. AUGUST 6, 2020

CONNOR MAXWELL. The Coronavirus Crisis Is Worsening Racial Inequality. *The Center for American Progress*. June 10, 2020.

-  [Submit Discussion Question for Epidemic Readings Assignment](#)



- **27 September - 3 October**

- Monday Model Exploration and Experimentation - Social Segregation

Model Reading:

[Schelling, T.C., 2006. *Micromotives and macrobehavior*. WW Norton & Company. Chapter 2](#)

Explore "Segregation" in the Netlogo Model in Library

-  [Quiz - Schelling Segregation File](#) Uploaded 17/09/18, 09:11
Download, complete and upload this quiz before class on Monday.
- Wednesday - NetLogo Coding Lab - Game of Life
-  [Game of Life Coding Instructions File](#) Uploaded 17/09/18, 09:13
- Friday - ZOOM DISCUSSION

Income Inequality

Readings:

[Henderson 2018 Income Inequality Isn't the Problem. Hoover Institute.](#)

[John Cassidy 2014 The New Yorker Forces of Divergence](#)

[Matthew Stewart. The 9.9 Percent Is the New American Aristocracy. The Atlantic. JUNE 2018](#)


- **4 October - 10 October**

- Monday - Model Exploration and Experimentation - SugarScape

Inequality Model Reading:

Epstein, J.M. and Axtell, R., 1996. *Growing artificial societies: social science from the bottom up*. Chapter 2. Brookings Institution Press.

Explore SugarScape "Wealth Distribution" in the Model Library

-  Quiz A&E Sugarscape File Uploaded 25/09/18, 19:49
Download and complete this reading quiz then upload your result to the Quiz upload link

- Wednesday - NetLogo Coding Lab - Hill Climbing

- Hill Climbing Code Activity

- Friday - ZOOM DISCUSSION

Globalization

Readings:

Arnett, J.J., 2002. The psychology of globalization. *American psychologist*, 57(10), pp.774-783.



John Micklethwait, and Adrian Wooldridge 2009 foreignpolicy.com-Think Again The Globalization Backlash

- **11 October - 17 October**

- Monday -Model Exploration and Experimentation Globalization

Model Reading:

[Axelrod, Robert. 1997. *The complexity of cooperation: Agent-based models of competition and collaboration*. Princeton University Press. Chapter 7 Disseminating Culture.](#)

-  [Quiz Axelrod Dissemination of Culture File](#) Uploaded 28/09/18, 15:26
download this quiz, fill it out and upload your version to the Quiz Upload link.
-  [NETLOGO MODEL: Axelrod's Dissemination of Culture File](#) Uploaded
1/10/18, 10:05
- Wednesday - NetLogo Coding Lab - Standing Ovation (a form of Contagion)

[Modeling a Standing Ovation](#)

- Friday -ZOOM DISCUSSION

Inter-ethnic violence, civil war and genocide

Readings:

[James Verini. 2014. How the World's Youngest Nation Descended into Bloody Civil War. NatGeo.](#)

[Hannah Beech, Saw Nang and Marlise Simons 'Kill All You See': In a First, Myanmar Soldiers Tell of Rohingya Slaughter, NYT, September 8, 2020](#)

[Phillip Gourevitch. 1995. After the Genocide. New Yorker.](#)

- **18 October - 24 October**

- Monday - Mid-Term Break - No Class

- Wednesday

Group Project Meetings:

Some Resources:

[NetLogo Community Models](#)

[Journal of Artificial Societies and Social Simulation- JASSS](#)

[Network for Computational Modeling in Social and Ecological Sciences](#)

[Modeling Commons: Netlogo](#)

- Friday - ZOOM DISCUSSION

Social Unrest and Rebellion

Readings

[RG Suny. 2009. The Empire Falls: The Revolutions of 1989. The Nation](#)

[Kate Phillips. 2014. Springtime in Tienanmen Square. The Atlantic](#)

[Kelly McEvers 2012 The Crackdown. Washington Monthly](#)

- Friday A&I Convocation with Ruth Wilson Gilmore

A&I students are expected to attend (view online either live or recorded). This Friday is the A&I convocation live session and I plan to have a discussion with you on Monday regarding how what we have been talking about in class intersects with Dr. Gilmore's talk.

There are two supplemental readings related to that talk that have been made available to all A&I students. Please read these in conjunction with your viewing of the talk.

["Beyond Bratton," in Policing the Planet. Verso, 2016 \(PDF file\)](#)

["Abolition Geography and the Problem of Innocence," in Futures of Black Radicalism. Verso, 2017 \(pdf file\)](#)





- **25 October - 31 October**

- Monday - Model Exploration and Experimentation - Rebellion

Model Reading:

Epstein, J.M., 2002. Modeling civil violence: An agent-based computational approach. Proceedings of the National Academy of Sciences, 99(suppl 3), pp.7243-7250.

The Rebellion Model is included in the Model Library, a version of the Genocide Model is linked below

-  Quiz Epstein Civil Violence Part 1 Rebellion File Uploaded 8/10/18, 16:56
Download and complete this reading quiz and upload it to the Quiz upload link
-  NETLOGO MODEL: Genocide File Uploaded 19/10/18, 10:01
- Wednesday - NetLogo Coding Lab - Spatial Competition Model
-  Hotelling Model File Uploaded 12/10/18, 10:45
Hidden from students
-  NetLogo Activity: Hotelling's Law: Location and Competition File
Uploaded 12/10/18, 09:26
- Friday

Commons Dilemmas and Resource Exploitation

Readings:

Garret Hardin The Tragedy of the Commons, Science, 13 December 1968, vol. 162, pp. 1243-48. reprinted in the Social Contract 2001

Meaghan Beatley & Sam Edwards. Overfished. gpinvestigation.

Jeffrey Hickel. 2018. Why Growth can't be Green. Foreign Policy.


- **1 November - 7 November**

- Monday - Model Exploration and Experimentation - Commons and Norms

Model Reading

[Axelrod, R., 1986. An evolutionary approach to norms. *American political science review*, 80\(4\), pp.1095-1111.](#)

[Axelrod Metanorms Model](#)


-  [Quiz for Axelrod's Evolution of Norms File](#) Uploaded 30/10/18, 16:28
Download and complete this quiz and upload it to the Quiz Upload Link
- Wednesday - NetLogo Coding Lab - Go Fish (working with lists)
- [Go Fish Lists Tutorial](#)

- **8 November - 14 November**

- Monday - Model Exploration and Experimentation - Bounded Rationality

[Arthur, W.B., 1994. Inductive reasoning and bounded rationality. *The American economic review*, 84\(2\), pp.406-411.](#)

Explore the "El Farol" model in the Model library

-  [Quiz El Farol Bar File](#) Uploaded 6/11/18, 17:43
Complete and upload this quiz to the Quiz Upload Link
- Wednesday - NetLogo Coding Lab - Group Projects
- Friday - ZOOM Discussion - Group Project Meetup and Check-in

- **15 November - 21 November**

- Monday

Group Presentations I

Wednesday

Group Presentations II

-  Group Code and Presentation Upload Assignment

for the Group Code Project students will work in teams or pairs to develop and original model or make a major code modification to an existing model.

At least one member of each group should upload the NetLogo model for the group presentation to this link.

For the presentation every member should have a turn at presenting one or more of the following elements which correspond to the info tabs of a detailed model...

1. What is it? The question or inspiration for the model and the theory or concepts you had to work with or identify

3. How it Works? The core model code and procedure - what happens when you press setup and go

4. How to Use it? The interface and display what are we looking at? what can we manipulate?

5. Things to Notice? Demonstrating a model run (it should work, right?)

- 6 Things to Try? Exploring the model outcomes and describing some experiments you conducted

- 7 Things to Add or Improve? What would you change or add?