

Mathematical Modeling of Social Phenomena

Tuesdays, 1.30pm - 4.30pm

Room: Stiteler Hall, B30

Instructor: Alexander Funcke

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Email: funcke@Oz.se (note: that is a zero)

Course page: <http://Oz.se/teaching/mmosp14.html> (note: that is a zero)

Mailing list: <http://groups.google.com/group/MMoSP/>

Instructions

Please note that all readings are to be read critically. Further a short 1-2 paragraph summary is to be handed in before the start of the lecture for which it is due, either on paper or via mail.

Evaluation

Class participation makes up for 40% of the final grade. Students are expected to be present, prepared and engaged. There will be a midterm project that will account for 40% of the grade, and lastly a final paper accounting for the remaining 20% of the grade. In the final paper students will be asked to (1) explain how s/he would employ any of the methods presented in the Advanced Theory Segment to her own model produced in the Project Segment, (2) write a somewhat creative and concise critique of a given model, and (3) be the advocate and argue for why a given model makes sense.

Basic Theory Segment

Week 1: Introduction

(2 September)

Podcast:

Emanuel Derman, *Theories, Models, and Science*, EconTalk, 2012

http://www.econtalk.org/archives/2012/03/derman_on_theor.html

(Note that Derman is neither a philosopher or an economist, and hence he will not necessarily use concepts as academics in these camps would.)

Week 2: Modeling overview

(9 September)

Readings:

Mark Granovetter, *Threshold models of collective behavior*, American journal of sociology, 1978
<http://www.jstor.org/stable/2778111>

Thomas C. Schelling, Dynamic models of segregation, The Journal of Mathematical Sociology, 1971
<http://www.tandfonline.com/doi/abs/10.1080/0022250X.1971.9989794>

Avinash Dixit and Barry Nalebuff, Prisoner's Dilemma in The Concise Encyclopedia Economics, 2nd Edition, 2014:
<http://www.econlib.org/library/Enc/PrisonersDilemma.html>

Week 3: Is modeling interesting?

(16 September)

Readings:

Milton Friedman, *The methodology of positive economics*, 1953
<http://digamo.free.fr/hausman82.pdf>

Paul Feyerabend, Excerpt from *Against Method*, 1971
<http://www.marxists.org/reference/subject/philosophy/works/ge/feyerabe.htm>

Deirdre McCloskey, *Rhetorics of Economics*, Journal of Economic Literature, 1983
<http://www.jstor.org/stable/2724987>

Week 4: What is a good model?

(23 September)

Readings:

Cowen, Tyler. The Postcard Test, The Grandma Test and The Aha Principle (p. 7) in *Discover Your Inner Economist: Use Incentives to Fall in Love, Survive Your Next Meeting, and Motivate Your Dentist*. 1st ed. Plume, 2008.
<http://books.google.com/books?id=NaxsePmiMuQC&pg=PT10&lpg=PT10&dq=The+Postcard+Test,+The+Grandma+Test+and+The+Aha+Principle&source=bl&ots=RRkpTOEDO1&sig=i-2BYTFGEpAfiYxEZwMml8gPTi4&hl=sv&sa=X&ei=ATn-U-bkEljLsASpulGQCQ&ved=0CDsQ6AEwAw#v=onepage&q=The%20Postcard%20Test%2C%20The%20Grandma%20Test%20and%20The%20Aha%20Principle&f=false>

Robert Sugden, Credible worlds: the status of theoretical models in economics, Journal of Economic Methodology, 2000
<http://www.tandfonline.com/doi/abs/10.1080/.VADlch9yi1k>

Uskali Mäki, On the method of isolation in economics,

<http://www.helsinki.fi/tint/maki/materials/on%20the%20method%20of%20isolation%20in%20economics.pdf>

Project segment

Week 5: Discuss modeling of phenomena

(30 September)

Prepare:

Read up on the following two phenomena. Do not read scholarly work, but rather everyday sources such as newspapers, magazines, blogs and what not. What are the stylized facts? What are the involved entities? What is the history of the phenomenon? What is the future? What determines if and how it occurs? And so forth ...

- (Online) dating
- Stereotyping

Write a 1-2 page summary (don't over invest in this) of your main take aways, include proper citations. Spend at least a focused hour to read up on each topic, before summarizing.

Week 6: Discuss sketched models

(7 October)

Prepare:

Use a presentation software, such as Prezi, Google Slides or PowerPoint, to sketch a model of some aspect of either (online) dating or the stereotyping. Be sure to be clear about:

1. the purpose of the model
2. the ontology of the model
3. the relationships in the model
4. any potential implications of the model
5. and not least, the weaknesses of the model

Week 7: Workshop to improve your models

(14 October)

Readings (no summarizing paragraph required):

Donald/Deirdre McCloskey, *Economical writing*, Economic Inquiry, 1985

<http://onlinelibrary.wiley.com/doi/10.1111/j.1465-7295.1985.tb01761.x/abstract>

Prepare:

Create a first draft of your model, it should include all the elements previously featured in the presentation, but reflect the feedback given during the previous presentation. Please employ symbolic language where appropriate in the paper, and where it is appropriate only.

Week 8: How to test a model

(21 October)

Prepare:

Update and polish your paper to reflect what you learned during the workshop. Aim to make the paper both academic, readable and interesting. This will be your project paper.

Week 9: Discuss the final papers

(28 October)

Readings:

The others' final papers. Read them critically, especially with reference to the basic theory.

Advance Theory Segment

Week 10/11: Agent-based modeling and Networks

(4/11 November)

Readings:

Robert A. Hanneman and Mark Riddle, *Introduction to social network methods*, 2005
(Chapter 1 and 3)

http://www.researchgate.net/publication/235737492_Introduction_to_social_network_methods/file/3deec52261e1577e6c.pdf

Thomas U. Grund, *Why Your Friends Are More Important and Special Than You Think*,
Sociological Science, 2014

<http://www.sociologicalscience.com/why-your-friends-are-more-important-and-special/>

TBA

Week 12/13: Game Theory and Evolutionary dynamics

(18/25 December)

Reading

Networks, Crowds, and Markets: Reasoning About a Highly Connected World

<http://www.cs.cornell.edu/home/kleinber/networks-book/>

(Chapter 6 and 7)

Peter Schuster, Karl Sigmund, *Replicator dynamics*, Journal of Theoretical Biology, 1983

<http://www.sciencedirect.com/science/article/pii/0022519383904459>

TBA

Week 14: Culture

(9 December)

Readings:

Cristina Bicchieri, *Grammar of Society*, 2006
(Chapter 1)

Policies

There is no explicit requirement for attendance, but if you fail to attend central parts of the course you will score badly on both the participation and project pillar of your grade. Very badly. Apart from being present in class you are expected to contribute to a constructive discussion, be concise and polite.

Late assignments will not be considered, respect the deadline. If you have reason to believe you might

If you have any special needs, please be sure to communicate this as soon as possible.

Academic Integrity

In this class we follow the Academic Integrity Code:

“No one will cheat or plagiarize or tolerate those who do so.”

Any malpractice will be reported. Collaboration in the project segment is encouraged up until the actual production of the presentations and papers.