Graduate Seminar: Topics in Computational Social Science  
Spring Semester at UW-Madison – 3 credits as Directed Study with D. Shah

Coordinating Faculty:

Joseph N. Cappella, University of Pennsylvania  
Noshir Contractor, Northwestern University  
Dhavan Shah, University of Wisconsin Madison

Time and Place:

1:00-4:00 CST / 2:00-5:00 EST on Tuesdays between 1/19/16 to 5/10/16  
Class meetings will be synchronous across locations  
Meet in 5011 Vilas Hall (Mass Communication Research Center)

Schedule:

Sixteen instructional sessions are slotted on Tuesdays at the specified time, with a required initial session on January an optional closing session on May 10. Each registering student is required to attend at least thirteen (13) of the sixteen (16) scheduled meetings. Given the three-hour meeting time of the seminar, that will generate 39.0 hours of instructional time at each participating institution. A formal schedule will follow, with the confirmed speakers and topics listed below. Each of the coordinating faculty members will also lead a session.

Structure:

After the introductory session when we discuss goals and explore points of collaboration, we will have a series of three-hour sessions, focused around the research of the scheduled speaker. Northwestern will handle the technology support, with a teleconferencing system used to connect the participating schools with the speaker. Each weekly session will have one hour dedicated to hearing a presentation from the invited researcher or coordinating faculty member, followed by about an hour of Q&A and joint discussion that will include the presenter, the participating faculty, and the students from each institution. After that, instructors will go offline for a focused session of one hour with the students at their institution, and discussion of individual/group projects, and reflections of the speaker’s work.

The seminar will culminate with a workshop hosted at Northwestern University:

June 21-22, 2016 at Evanston, IL (costs of travel will be covered)

The workshop is scheduled to precede the 2016 International Conference on Computational Social Science, June 23-26 at Northwestern University: [www.kellogg.northwestern.edu/news-events/conference/ic2s2/2016.aspx](http://www.kellogg.northwestern.edu/news-events/conference/ic2s2/2016.aspx)

Student Profile:

Students who take this class should have some familiarity with computational methods and tools, and an active research project or program that involves use of these approaches in social science inquiry. Students beginning such projects are welcome, but will be expected to develop that work over the term.
**Orienting Readings:**


**Topic Areas and Confirmed Speakers:** (Scheduling and reading TBD)

**Computational approaches to language processing and prediction:**

**Lyle Ungar, U. of Pennsylvania**

"Inferring Individual and County Level Traits from Social Media"

Readings:


**Munmun De Choudhury, Georgia Tech**

"Opportunities and Challenges of Social Media in Personal and Societal Well-being"

Readings:


**Catalina Toma, U. of Wisconsin**

"Language and Social Dynamics in Computer-Mediated Communication: Theory, Methods, and Empirical Finding"

Readings:


Dhavan Shah, U. of Wisconsin

“Tracing Sentiment in Networked Spheres: Rethinking the Nature of Communication Influence”

Readings:


**Computational approaches in network science:**

Ron Burt – U. of Chicago

“Social networks and structural holes: Evidence of Network Advantage”

Readings:


Sandra Gonzalez Bailon, U. of Pennsylvania

“Tools to Map the Structure of Large-Scale Coordination – and Applications to the Study of Political Mobilization.”

Readings:


Barberá, Pablo, Ning Wang, Richard Bonneau, John Jost, Jonathan Nagler, Joshua


Duncan Watts - Microsoft Research

"Collective Dynamics of 'Small-World' Networks"

Readings:


Lada Adamic, U. of Michigan

"Social Networks, Information Diffusion, and Online Communities"

Readings:


Computer-based and agent-based modeling:

Michael Macy, Cornell

"Computational Thought Experiments using Agent Based Models"

Readings:


Damon Centola, U. of Pennsylvania

“Large Networks and Agent-based Modeling”

Readings:


Nosh Contactor, Northwestern

“Computational Models of Communication and Knowledge Networks”

Readings:


Uri Wilensky, Northwestern

“Connected Learning, Computer-Based Modeling, NetLogo Agent-based Modeling Software”

Readings:


**Algorithmic tools and recommender systems:**

**Paul Resnick, U. of Michigan**

“Recommender Systems, Collaborative Filtering, and SocioTechnical Capital”

Readings:


**Jen Golbeck – U. of Maryland**

"Uncovering Hidden Personal Attributes from Social Media"

Readings:


**Joseph Cappella, U. of Pennsylvania**

Recommender systems, algorithms, and effective health messages

Readings:


**Projects and Data:**

Individual or group projects are permitted, with collaborations across universities

Available data sets include:

- Twitter Archive at UW- Madison - for collaboration with UW researchers
- English Gigaword Archive - [https://catalog.ldc.upenn.edu/LDC2011T07](https://catalog.ldc.upenn.edu/LDC2011T07)
- CHESS Health Social Networking Data – request data access w/ abstract
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<thead>
<tr>
<th>Meeting Date</th>
<th>Session Topic</th>
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<tr>
<td>Jan 19</td>
<td>Joe Cappella, Nosh Contractor, and Dhavan Shah - Introduction: Goals and Structure</td>
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<td>Jan 26</td>
<td>Jen Golbeck – U. of Maryland - &quot;Uncovering Hidden Personal Attributes from Social Media&quot;</td>
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<td>Feb 9</td>
<td>Michael Macy, Cornell - “Computational Thought Experiments using Agent Based Models”</td>
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<td>Feb 16</td>
<td>Dhavan Shah, U. of Wisconsin - “Tracing Sentiment in Networked Spheres: Rethinking the Nature of Communication Influence”</td>
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<td>Feb 23</td>
<td>Lyle Ungar, U. of Pennsylvania - “Inferring Individual and County Level Traits from Social Media”</td>
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<td>Mar 1</td>
<td>Lada Adamic, U. of Michigan - TOPIC: Social networks, information diffusion, and online communities</td>
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<td>Mar 8</td>
<td>Sandra Gonzalez Bailon, U. of Pennsylvania - “Tools to Map the Structure of Large-Scale Coordination – and Applications to the Study of Political Mobilization.”</td>
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<td>Mar 22</td>
<td>Duncan Watts - Microsoft Research - TOPIC: Collective dynamics of 'small-world' networks</td>
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<td>Mar 29</td>
<td>Damon Centola, U. of Pennsylvania - TOPIC: Large networks and agent-based modeling</td>
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<td>Apr 5</td>
<td>Joseph Cappella, U. of Pennsylvania – TOPIC: Recommender systems, algorithms, and effective health messages</td>
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<td>Apr 12</td>
<td>Nosh Contactor, Northwestern – TOPIC: Computational models of communication and knowledge networks</td>
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<td>Apr 26</td>
<td>Munmun De Choudhury, Georgia Tech – “Opportunities and Challenges of Social Media in Personal and Societal Well-being”</td>
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<td>May 3</td>
<td>Uri Wilensky, Northwestern - TOPIC: Connected Learning and Computer-Based Modeling Jure Leskovec, Stanford – TOPIC: Massive networks, higher order network structures</td>
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<td>May 10</td>
<td>Optional Closing: Reflections and Collaborations</td>
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