



1st Term Seminar 2019-2020

Foundations of Computational Social Science

Given by Arnout van de Rijt

Open to: all researchers, visiting students, MW fellows and other research fellows at EUI

Mondays, 15:00-17:00

Seminar Room 2, Badia Fiesolana

Register [online](#)

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Course Description and Objectives

This course shows how the creative use of new methods for theoretical and empirical analysis enabled by new computing and communication technologies can advance research fields in social and political sciences. Each week we look at recent advancements in one field of research. The methods include among other things: analysis of large-scale (“Big”) internet data, agent-based modeling, social network analysis, (quasi-)experimental methods using the internet, and Monte Carlo methods. Discussion of the readings is aimed at appreciating the analytical leverage computational methods provide vis-à-vis standard methods for knowledge accumulation in a given area: What can we learn that we would otherwise not have been able to learn? What questions can be answered that were previously considered unanswerable? The objective of the course is to make it natural for students to think out-of-the-box and consider non-traditional analysis approaches in their own work.

Requirements for credits: Weekly response papers identifying a problem in / follow-up question on the assigned readings and sketching a computational research strategy that solves / provides an answer; active participation in weekly meetings.

Schedule

| Week | Day | Topic (<i>computational methods</i>) | Readings |
|------|-------------|--|--|
| 1 | October 7 | Rich-get-richer processes <i>(macro experiments, online field experiments, regression discontinuity)</i> | Merton (1962) Allison (1982) Salganik (2006) van de Rijt (2014) Bol (2018) |
| 2 | October 14 | Political and social mobilization <i>(Facebook field experiment, Facebook case study, online experiment)</i> | Bond (2011) Margetts (2011) Lewis (2014) Gonzalez (2015) |
| 3 | October 21 | Segregation of networks and neighborhoods <i>(agent-based modeling, online experiment)</i> | Schelling (1973) Bruch (2005) van de Rijt (2009) Centola (2015) |
| 4 | October 28 | Gender and racial inequality <i>(online newspapers, AirBnB data, online experiment, equality analysis of algorithms)</i> | Hogan (2011) Shor (2015) Jia (2016) Wilson (2019) |
| 5 | November 4 | The small world phenomenon <i>(social network data, online experiment)</i> | Milgram (1967) Watts (1998) Dodds (2003) Ugander (2011) |
| 6 | November 11 | The strength of weak ties <i>(Facebook data, macro online experiment)</i> | Granovetter (1973) Centola (2010) Gee (2017) Park (2018) |
| 7 | November 18 | Political polarization <i>(Facebook data, survey data, macro online experiment, Twitter field experiment)</i> | Baldassarri (2008) Bakshy (2015) Bail (2018) Guilbeault (2018) |
| 8 | November 25 | Peer effects <i>(online field experiment, offline field experiment, supermarket scan data)</i> | Schultz (2007) Mas (2009) Alcotts (2011) Restivo (2012) |
| 9 | December 2 | The wisdom of the crowd <i>(internet experiments, modeling)</i> | Galton (1902) Lorenz (2007) Becker (2017) Friedkin (2017) |
| 10 | December 9 | Balance in interpersonal and international relations <i>(sentiment data from online platforms, pre-internet sentiment data)</i> | Szell (2010) Leskovec (2010) Doreian (2015) Rawlings (2017) |

Meeting 1 (October 7). *Cumulative advantage and the Matthew Effect*

Allison, P. D., Long, J. S., & Krauze, T. K. (1982). Cumulative advantage and inequality in science. *American Sociological Review*, 615-625.

Salganik, M. J., Dodds, P. S., & Watts, D. J. (2006). Experimental study of inequality and unpredictability in an artificial cultural market. *Science*, 311(5762), 854-856.

Van de Rijt, A., Kang, S. M., Restivo, M., & Patil, A. (2014). Field experiments of success-breeds-success dynamics. *Proceedings of the National Academy of Sciences*, 111(19), 6934-6939.

Bol, T., de Vaan, M., & van de Rijt, A. (2018). The Matthew effect in science funding. *Proceedings of the National Academy of Sciences*, 115(19), 4887-4890.

Optional:

Merton, R. K. (1968). The Matthew effect in science: The reward and communication systems of science are considered. *Science*, 159(3810), 56-63.

Meeting 2 (October 14). *Political and social mobilization*

Margetts, H., John, P., Escher, T., & Reissfelder, S. (2011). Social information and political participation on the internet: an experiment. *European Political Science Review*, 3(3), 321-344.

Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D., Marlow, C., Settle, J. E., & Fowler, J. H. (2012). A 61-million-person experiment in social influence and political mobilization. *Nature*, 489(7415), 295.

Lewis, K., Gray, K., & Meierhenrich, J. (2014). The structure of online activism. *Sociological Science*, 1, 1-9.

Gonzalez-Vaillant, G., Tyagi, J., Akin, I. A., Poma, F. P., Schwartz, M., & van de Rijt, A. (2015). A Field-Experimental Study of Emergent Mobilization in Online Collective Action. *Mobilization: An International Quarterly*, 20(3), 281-303.

Optional:

Vasi, I. B., Walker, E. T., Johnson, J. S., & Tan, H. F. (2015). "No fracking way!" Documentary film, discursive opportunity, and local opposition against hydraulic fracturing in the United States, 2010 to 2013. *American Sociological Review*, 80(5), 934-959

Meeting 3 (October 21). *Segregation of networks and neighborhoods*

Schelling, T. C. (1971). Dynamic models of segregation. *Journal of mathematical sociology*, 1(2), 143-186.

Bruch, E. E., & Mare, R. D. (2006). Neighborhood choice and neighborhood change. *American Journal of Sociology*, 112(3), 667-709.

Van de Rijt, A., Siegel, D., & Macy, M. (2009). Neighborhood chance and neighborhood change: A comment on Bruch and Mare. *American Journal of Sociology*, 114(4), 1166-1180.

Centola, D., & van de Rijt, A. (2015). Choosing your network: Social preferences in an online health community. *Social Science & Medicine*, 125, 19-31.

Optional:

Hofstra, B., Corten, R., Van Tubergen, F., & Ellison, N. B. (2017). Sources of segregation in social networks: A novel approach using Facebook. *American Sociological Review*, 82(3), 625-656.

Meeting 4 (October 28). *Gender and racial inequality*

Hogan, B., & Berry, B. (2011). Racial and ethnic biases in rental housing: An audit study of online apartment listings. *City & Community*, 10(4), 351-372.

Shor, E., van de Rijt, A., Miltsov, A., Kulkarni, V., & Skiena, S. (2015). A paper ceiling: Explaining the persistent underrepresentation of women in printed news. *American Sociological Review*, 80(5), 960-984.

Jia, S., Lansdall-Welfare, T., Sudhakar, S., Carter, C., & Cristianini, N. (2016). Women are seen more than heard in online newspapers. *PloS one*, 11(2), e0148434.

Wilson, B., Hoffman, J., & Morgenstern, J. (2019). Predictive inequity in object detection. *arXiv:1902.11097*.

Optional:

Edelman, B., Luca, M., & Svirsky, D. (2017). Racial discrimination in the sharing economy: Evidence from a field experiment. *American Economic Journal: Applied Economics*, 9(2), 1-22.

Kakar, V., Voelz, J., Wu, J., & Franco, J. (2018). The visible host: Does race guide Airbnb rental rates in San Francisco?. *Journal of Housing Economics*, 40, 25-40.

Meeting 5 (November 4). *The small world phenomenon*

Milgram, S. (1967). The small world problem. *Psychology Today*, 2(1), 60-67.

Watts, D. J., & Strogatz, S. H. (1998). Collective dynamics of 'small-world' networks. *Nature*, 393(6684), 440.

Dodds, P. S., Muhamad, R., & Watts, D. J. (2003). An experimental study of search in global social networks. *Science*, 301(5634), 827-829.

Ugander, J., Karrer, B., Backstrom, L., & Marlow, C. (2011). The anatomy of the Facebook social graph. *arXiv preprint arXiv:1111.4503*.

Meeting 6 (November 11). *The strength of weak ties*

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380.

Centola, D. (2010). The spread of behavior in an online social network experiment. *Science*, 329(5996), 1194-1197.

Gee, L. K., Jones, J. J., Fariss, C. J., Burke, M., & Fowler, J. H. (2017). The paradox of weak ties in 55 countries. *Journal of Economic Behavior & Organization*, 133, 362-372.

Park, P. S., Blumenstock, J. E., & Macy, M. W. (2018). The strength of long-range ties in population-scale social networks. *Science*, 362(6421), 1410-1413.

Meeting 7 (November 18). *Political polarization*

Baldassarri, D., & Gelman, A. (2008). Partisans without constraint: Political polarization and trends in American public opinion. *American Journal of Sociology*, 114(2), 408-446.

Bakshy, E., Messing, S., & Adamic, L. A. (2015). Exposure to ideologically diverse news and opinion on Facebook. *Science*, 348(6239), 1130-1132.

Bail, C. A., Argyle, L. P., Brown, T. W., Bumpus, J. P., Chen, H., Hunzaker, M. F., ... & Volfovsky, A. (2018). Exposure to opposing views on social media can increase political polarization. *Proceedings of the National Academy of Sciences*, 115(37), 9216-9221.

Guilbeault, D., Becker, J., & Centola, D. (2018). Social learning and partisan bias in the interpretation of climate trends. *Proceedings of the National Academy of Sciences*, 115(39), 9714-9719.

Optional:

Asker, D., & Dinas, E. (2017). Do Online Media Polarize? Evidence from the Comments' Section. [available at SSRN]

Meeting 8 (November 25). *Peer effects*

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological Science*, 18(5), 429-434.

Mas, A., & Moretti, E. (2009). Peers at work. *American Economic Review*, 99(1), 112-45.

Allcott, H. (2011). Social norms and energy conservation. *Journal of Public Economics*, 95(9-10), 1082-1095.

Restivo, M., & Van De Rijt, A. (2012). Experimental study of informal rewards in peer production. *PloS one*, 7(3), e34358.

Optional:

Gallus, J. (2016). Fostering public good contributions with symbolic awards: A large-scale natural field experiment at Wikipedia. *Management Science*, 63(12), 3999-4015.

Meeting 9 (December 2). *The wisdom of the crowd*

Galton, F. (1907). Vox populi (the wisdom of crowds). *Nature*, 75(7), 450-451.

Lorenz, J., Rauhut, H., Schweitzer, F., & Helbing, D. (2011). How social influence can undermine the wisdom of crowd effect. *Proceedings of the national academy of sciences*, 108(22), 9020-9025.

Becker, J., Brackbill, D., & Centola, D. (2017). Network dynamics of social influence in the wisdom of crowds. *Proceedings of the national academy of sciences*, 114(26), E5070-E5076.

Friedkin, N. E., & Bullo, F. (2017). How truth wins in opinion dynamics along issue sequences. *Proceedings of the National Academy of Sciences*, 114(43), 11380-11385.

Meeting 10 (December 9). *Balance in interpersonal and international relations*

Szell, M., Lambiotte, R., & Thurner, S. (2010). Multirelational organization of large-scale social networks in an online world. *Proceedings of the National Academy of Sciences*, *107*(31), 13636-13641.

Leskovec, J., Huttenlocher, D., & Kleinberg, J. (2010). Signed networks in social media. In *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1361-1370). ACM.

Doreian, P., & A. Mrvar. (2015). Structural balance and signed international relations. *Journal of Social Structure*, *16*, 1.

Rawlings, C. M., & Friedkin, N. E. (2017). The structural balance theory of sentiment networks: Elaboration and test. *American Journal of Sociology*, *123*(2), 510-548.