Management Science II, Summer Term 2020
ESMT Learning Center (Main Building), Schlossplatz 1
Thursdays 9:00am to 12:00noon (please see separate schedule for further details)

Part 1: Networks and organizations I

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Part 2: Networks and organizations II

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Part 3: Innovation, intellectual property rights and the market for technology

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Course overview

This course is composed of three parts. The first part of the course introduces social network analysis in Organizations. We will look at what makes network analysis special in conceptual and methodological terms before touching on two key topics in the literature: the role of individuals in networks and the dynamics of networks. This first part will equip you with the knowledge that you need to embark in more advanced topics in network analysis.

The second part of the course explores empirical applications of network-analytic methods to a wide array of agents—professional auto racers, gangsters, college fraternity members, and words in semantic networks. In addition to our empirical emphasis, we’ll consider a game-theoretic network formation model designed to better understand the performance-related consequences of peer
monitoring within the firm. Our final session will then draw on lessons regarding argumentation and evidence emerging from earlier sessions.

The third part of the course focuses on the economics of innovation and dives into studies of “Innovation, Intellectual Property Rights and the Market for Technology”. The sessions touch upon important topics related to intellectual property rights (in particular patent rights) and how they affect innovative activity. Moreover, we discover how information published in patents can be used as a method to trace knowledge flows over time and geographies – a technique which has been used to address a wide range of questions in Management and Economics.

Course format

We will meet once a week for three hours. In each meeting, you are expected to have prepared the assigned readings for each session. While reading the papers it may be useful to first identify the research question, major concepts used to formulate the research problem, the methodology used, key findings and its major shortcomings or weaknesses. You should then be able to suggest research ideas on how to address the weak or problematic aspects of the article.

Selected readings are available at: https://cloud.esmt.org/s/WAgKiKaNsgqKoYN

Each participant will be assigned to present at least one paper in class during the course depending on the number of participants. The student assigned the paper being discussed is not only expected to introduce the paper but also to lead the class discussion. The presentation assignments will be communicated after the first session.

Prerequisites

Participants should be familiar with basic microeconomic tools as well as have a basic understanding of multivariate regression analysis.

Course evaluation

Performance evaluation will be based on three building blocks:

Class participation (20%) The course will be highly interactive and you are expected to advance discussions in the classroom by your participation. Note that the evaluation of your class participation will be based on quality not quantity.

Paper presentations (30%) You are expected to present at least one paper during the course (see above).

Term paper/referee report (50%) Grading of the written contribution is based on one individual assignment for which each student is expected to write one referee report on a recent research paper. The instructors will provide a list of research papers on the topics of each part of the course from which students could choose one paper to prepare a referee report. The list of research papers will be provided during the course. Alternatively, students can opt to write a term paper in the form of a research proposal. Referee reports and research proposals are due by September 15, 2020.
### Course Sessions

**Session 1**
**Thursday, April 23, 2020**
**9:00–12:00**

**Session topic** | **Key ideas in organizational network analysis**
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Departing from other perspectives, SNA assumes that actors (e.g., individuals, groups, organizations) influence each other through their relations and that these relations drive many social processes and organizational outcomes. As such, by examining the structure of relations among actors, network approaches seek to explain variations in behaviors and outcomes at different levels of analysis. This session provides an overview of the key ideas, debates and issues in organizational network analysis.

**Required Readings:**

**Optional Readings:**

**Session 2**
**Thursday, April 30, 2020**
**9:00–12:00**

**Session topic** | **Network data, methods and dependence assumptions**
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The beauty of network analysis lies in its underlying mathematical nature. Building on matrix algebra and graph theory, network measures have been developed to represent precisely the patterns of social relations that surround actors. However, network data
requires specific tools and methods for its collection and analysis. Also, because network analysis is based on the assumption that observations are dependent, standard statistical analysis methods are in most cases inappropriate.


Session 3
Thursday, May 7, 2020
9:00–12:00

Session topic

Individuals and networks

Individuals and networks have a complex relationship. The mathematical and sociological roots of social network analysis have led the field to focus on the structure of relationships that surround an individual. For a long time, research has been built on the assumption that the network position in which individuals find themselves drive their thoughts and behavior, regardless of the individual occupying this position. But to what extent is this true? We will start by discussing one of the most established positions in social network analysis and articulate its structural dimension. Then we look at the individual within the position and examine how individual characteristics affect the relationship between structure and outcomes.

Optional Readings:

- Borgatti et al., Chapter 10: Centrality

Session 4
Thursday, May 14, 2020
9:00–12:00

Session topic: Dynamics of networks

This session looks deeper into the dynamics of networks. There is still not much research that examines how networks evolve over time, i.e., when new ties form and existing ones dissolve. We will discuss the assigned literature and review the different explanations for tie formation and persistence as well as reflect on the way in which time can be embedded in network theory and methods.

Required Readings:


Optional Readings:

Please note the following on timing and format: If, as we hope, we return to in-person teaching by May 28, we will proceed as planned in this version of the syllabus. Conversely, if Zoom-based teaching is still necessary by May 28, our current plan is that Wagner’s sessions start on May 28, while Bothner’s sessions will take place (a) either in-person starting on June 25 or (b) in same-day, morning and afternoon sessions occurring at times mutually agreed to by students and faculty.

Part 2: Networks and organizations II
Further topics in network analysis, including semantic networks, strategic network formation, and Bonacich centrality

Matt Bothner

Course Sessions

Session 5
Thursday, May 28, 2020
9:00–12:00

Session topic: Competition and behaviour in vertical networks

This session examines how competition with near-peers in vertical networks affects risk-taking behaviour, captured as auto racers’ propensity to crash their vehicles in a dynamic tournament. Our first, substantive goal is thus to better understand the effect of rivalry on risk-taking. Our second, professionalization goal is different: we’ll interactively address general principles for responding to referee reports. These two goals will require you to engage with a submitted draft on competition in vertical networks, as well as referee reports, and then to present in small groups your responses, as if you’d received these referee reports. All materials necessary for your presentations will be distributed closer to the time of our May 28 class.

Readings: materials to be distributed

Session 6
Thursday, June 4, 2020
9:00–12:00

Session topic: Structural equivalence in competitive and semantic networks

Two people are structurally equivalent to the degree that they have similar connections to the same third-parties. Two words—such as *leader* and *manager*—are structurally equivalent if they could
plausibly “stand in” for each other in the sentences that constitute a large corpus of text. Structural equivalence is one of the conceptual building blocks of network science. In this session, we’ll use structural equivalence to study two empirical subjects: the sources of aggressive behavior and the time-varying meaning(s) of leadership. Our data will range from the networks of competition that emerge among professional athletes to semantic networks generated through an AI-based language model.

Readings:


Session 7
Thursday, June 11, 2020
9:00–12:00

Session topic Social comparisons and social status

At the core of the network-analytic perspective is a portrayal of human beings as “molecular,” not “atomistic.” We’ll start this session with a working paper that examines the performance-related consequences of employees in a firm becoming less atomistic— that is, more conscious of the performance of their colleagues. We’ll consider the question: does employees’ effort rise or fall as they more deeply engage in social comparisons? And if this is context-dependent, what are the important contextual modifiers? We’ll then go further into the social dimension by considering themes in the networks literature on social status.

Readings:


Session 8
Thursday, June 18, 2020
9:00–12:00

Session topic

Argument and evidence in Management Science

An important discussion emerging in our earlier sessions surrounded the question of what constitutes a strong theoretical argument in Management Science. We will by now also have had several discussions on the kinds of evidence that plausibly support (or shut down) a compelling theoretical argument. In this session, you’ll have the opportunity to hone your skills in the areas of theoretical argumentation and in marshaling persuasive evidence.

The deliverables for which you’re responsible are twofold. The first is a brief, video-taped conference-style presentation, taking one of two directions: (a) you discuss a new research idea, one that’s not yet an ongoing working paper; or (b) you summarize a paper that has inspired you, perhaps even one of the papers that inspired you to become a researcher. The second deliverable is feedback on your colleagues’ presentations. Materials for this session will be distributed closer to the time of our June 18 class.

Readings:

Materials to be distributed
Part 3: Innovation, intellectual property rights and the market for technology

Stefan Wagner

Course Sessions

Session 9
Thursday, June 25, 2020
9:00–12:00

Session topic: A primer on intellectual property rights

During this session we will introduce a set of legal tools establishing incentives to innovate as they allow capturing the value of innovations by excluding third parties from using them: copyrights, trademarks, trade secrets and patents. The first part of the session helps to understand the power and limitations of these tools. During the second part, we will focus on the protection of technical know-how using patent rights. This includes a discussion of empirical papers analyzing the effect of patent rights on innovative activities.

Required reading:


Optional reading:


Session 10
Thursday, July 2, 2020
9:00–12:00

Session topic

Patent thickets, patent trolls and other frictions in the market for technology – is the patent system broken?

Most patent offices have seen an explosion of patent filings over the last two decades. We will discuss what is behind this surge in patent filing rates and analyze resulting problems for innovating firms – most notably the emergence of hold-up situations in complex high-technology industries (mobile phones).

Required reading:


Optional reading:


Additional Multimedia to watch/listen to before or after the session (highly recommended):

Session 11
Thursday, July 9, 2020
9:00–12:00

Session topic  Measuring knowledge flows using patent data

Despite the existence of IP regimes excludability of third parties from ideas usually is incomplete and knowledge flows between firms. In this session we will review empirical studies that focus on the measurement of knowledge flows and the underlying mechanisms.

Required reading:


Optional reading:


Session 12
Thursday, July 16, 2020
9:00–12:00

Session topic  Final presentations – Wrap up
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This is the last session of the course. Participants will have a chance to present the status of their written assignment in order to get feedback from the class and the instructors.

Readings: none