INTRODUCTION TO SOCIAL NETWORK ANALYSIS USING ADVANCED DATA MINING

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## COURSE OVERVIEW

<table>
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<tr>
<th>Course Name:</th>
<th>INTRODUCTION TO SOCIAL NETWORK ANALYSIS USING ADVANCED DATA MINING</th>
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| Degree Programmes: | 1. Post-Docs and PhD students  
2. Master BWL (all): MSBWL10, MSBWL13  
   Master Wirtschaftswissenschaften (all specializations):  
   MSWiWi10, MSWiWi14  
   Master Wirt.-Ing. (MSWiBau, MSWiEET, MSWiWPT, MSWiMB,  
   all specializations): MSWi10, MSWi15 |
| Lecturer: | Univ.-Prof. Dr. Richard Weber |
| Contact: | rweber@dii.uchile.cl |
| Location and Time: | Kackertstraße 7, Room B201 or B037 or online  
13 September to 17 September, 9am-12pm and 2pm-5pm |
| Content Description: | Social networks play an ever increasing role in our society. Facebook, Instagram, and Twitter are just some examples of internet sites where users can network. Many traditional business decisions will be influenced by social network analysis (SNA). Loan granting or marketing campaigns are just two examples. But also less traditional areas, such as e.g. investigation of organized crime can benefit from this relatively new approach. This course first lays the foundation for social network analysis by introducing advanced data mining techniques. Then the main topics related to SNA will be introduced. Applications with real-world data from social networks using the respective software tools will conclude the course. |
| Qualification Objectives: | This course seeks to enhance participants’ ability to:  
   • understand the potential of social network analysis (SNA) in different areas,  
   • select the adequate methods for network analysis,  
   • analyze social networks using advanced data mining techniques,  
   • propose decisions based on the respective network analyses. |
| Literature: | See readings below |
| Course Examination: | The final grade will be composed as follows:  
1. Group work including student presentation and report (weight: 50%) and  
2. Individual written exam (60 minutes) (weight: 50%). |
2. Willingness to engage in preparatory readings of case studies and/or research papers.  
3. Exchange and Erasmus students are cordially invited to apply for participation in this course. |
| Group Size: | 30 participants (max) |
| Workload: | 30 hours of lecturing and group work  
Additional individual and group preparation |
| Type of Teaching Event: | Lecture with integrated individual and group work on datasets |
| Language: | English |
| Credits: | 5 |
SCOPE OF THE COURSE

Social networks play an ever increasing role in our society. Facebook, Instagram, and Twitter are just some examples of internet sites where users can network. Many traditional business decisions will be influenced by social network analysis (SNA). Loan granting or marketing campaigns are just two examples. But also less traditional areas, such as e.g. investigation of organized crime can benefit from this relatively new approach. This course first lays the foundation for social network analysis by introducing advanced data mining techniques. Then the main topics related to SNA will be introduced. Applications with real-world data from social networks using the respective software tools will conclude the course.

This course seeks to enhance participants’ ability to:

1. understand the potential of social network analysis (SNA) in different areas,
2. select the adequate methods for network analysis,
3. analyze social networks using advanced data mining techniques,
4. propose decisions based on the respective network analyses.

PARTICIPANTS AND REQUIREMENTS

Participants

1. Post-Docs and PhD students
2. Master BWL (all specializations): MSBW10, MSBW13
   Master Wirtschaftswissenschaften (all specializations): MSWiWi10, MSWiWi14
   Master Wirt.-Ing. (MSWiBau, MSWiEET, MSWiWPT, MSWiMB, all specializations): MSWi10, MSWi15

Due to the interactive teaching format, the number of participants is limited to 30.

Advanced master students are invited to participate, but preference will be given to PhD students.
Participants should bring a personal computer/laptop to practically employ the contents learned in theory sessions. The software environment for statistical computing and graphics R (https://www.r-project.org/) will be used to apply the concepts acquired in class.

Requirements

- Solid command of English.
- Willingness to engage in preparatory readings of case studies and/or research papers.
- Exchange and Erasmus students are cordially invited to apply for participation in this course.
Grading

The final grade will be composed as follows:
1. Group work including student presentation and report (weight: 50%) and
2. individual written exam (60 minutes) (weight: 50%).

Complete attendance of each session of the course is obligatory. Absolutely no exceptions apply. Leaves will only be granted in cases of illnesses or if the person demanding a leave is required to participate in an official activity of the University, Faculty, or Institute. In the first case, the doctor's medical certificate must be presented to the Chair immediately (i.e. latest by the first working day following the absence day). Failure to comply with this rule leads to a no-pass grade. Passing grades can generally not be earned by students who miss more than 20% of the total class-time

TENTATIVE COURSE SCHEDULE

The lecturing days will comprise a morning session (9:00-12:00) and an afternoon session (14:00-17:00) that cover the indicated topics.

Day 1: Motivation and Introduction to Social Network Analysis

Preparatory Readings:
Fan, W., Gordon, M.D. (2014): The Power of Social Media Analytics. Communications of the ACM 57, No.6, 74-81

Additional Readings:

Day 2: Advanced Data Mining as a Tool for Social Network Analysis

Preparatory Readings:

Additional Readings:

Day 3: Basic concepts of Social Network Analysis

Preparatory Reading:
Additional Readings:

Day 4: Applications of Social Network Analysis

Preparatory Reading:

Additional Readings:

Day 5: Integration into decision-making processes and evaluation

Preparatory Reading:

Additional Readings:
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