Course Descriptions

1) Introduction to Social Network Analysis

Dates: Tuesday 1 June - Friday 4 June 2021 (12:00-19:00 BST)

About:

The goal of the course is to provide attendees with a general overview of the field of social network analysis, confidence in using its key analytical tools in practice, and insight into how it can be used in scholarly practice in the social, economic, managerial and political disciplines.

Requirements

All social science backgrounds are welcome, and participants are assumed not to have any previous knowledge of SNA, or of any analytical or statistical software.

Participants will be mainly expected to use UCINET and Netdraw during the course (even if other software will be discussed). No previous experience with the software is expected.

At the end of the course participants will be able to:

1. independently design a research programme requiring SNA in their own field of research;
2. collect and manage network data;
3. analyse, interpret and visualise fundamental network measures at the individual, group and network level;
4. confidently use UCINET and NetDraw to perform network analysis and visualise network data.
5. Apply basic social network analysis knowledge to bibliometric analysis, organisational network analysis or advanced visualisation techniques.

Part 1) Doing Research with SNA: Tools, Theories, and Applications

Dates: Tuesday 1 June - Thursday 3 June 2021 (12:00-19:00 BST)

Instructors: Riccardo De Vita, Stefano Ghinoi, Sara Gorgoni, Guido Conaldi, Francesca Pallotti, Anna Piazza

The focus is on research design and how SNA elements can be successfully integrated into a research project, paper, or dissertation. Participants will be introduced to UCINET and Netdraw software via practical exercises

Part 2) Elective Workshop

Date: Friday 4 June 2021 (12:00-19:00 BST)
About:
Three alternative one-day workshops allow participants to consolidate their introductory understanding of social network analysis with an area of greater specialisation:

A) Bibliometric Analysis

Instructors: Stefano Ghinoi

An introduction to citation networks and thematic analysis of journal papers. Participants will be introduced to citation network analysis, including specialised software such as VosViewer and the R package *bibliometrix*, online bibliometric repositories such as Scopus, Web of Science and Semantic Scholar, and thematic categorisation techniques such as LDA.

B) Organisational Network Analysis

Instructors: Bruce Cronin, Anna Piazza

An introduction to the application of social network analysis to inter- and intra-organisational networks, where social interactions are strongly structured by organisational routines and priorities. While the focus will be primarily on business networks, participants are welcome to bring their own datasets or discuss other organisational settings. The workshop will consider issues in dealing with multi-mode networks and big archival datasets, including entity resolution techniques.

C) Social Network Visualisation

Instructors: Guido Conaldi

An introduction to specialised network visualisation software tools that allow sophisticated visualisations of social networks. Participants will learn to use tools such as Gephi and Visone to produce arresting visualisations.

2) Advanced Social Network Techniques in R

Dates: Tuesday 1 June - Friday 4 June 2021 (12:00-19:00 BST)

About:
The goal of the course is to provide attendees with an introduction to advanced social network analytic techniques making use of packages in the R programming language.

Requirements
Participants are assumed to have introductory knowledge of social network analysis, as from using software packages such as UCINET, but no prior knowledge of programming, the R programming language, or statistics is required. Participants will be introduced to elementary R-programming and elementary statistics in the course of exploring each specialised application.

At the end of the course participants will be able to:

1. choose an appropriate advanced network analytic method for a particular research question and dataset;
2. confidently use each method with network data;
3. accurately interpret results in terms of a research question;
4. create advanced research designs for their particular areas of interest.

Part 1) Longitudinal Network Analysis with RSiena

Date: Tuesday 1 June 2021 (12:00-19:00 BST)

Instructor: Guido Conaldi
The workshop will give an introduction to statistical modelling of longitudinal social network data and the basics of using the R-package *rsiena*. This workshop teaches statistical models to analyse data implemented in the *rsiena* software, focusing on: the bases of statistical methodology; examples of possible applications to the social and economic sciences; and the use of the programme.

Part 2) Relational Event Models

Date: Wednesday 2 June 2021 (12:00-19:00 BST)

Instructor: Guido Conaldi
Relational Event Models investigate the effects of timing or the order of events in social interactions, such as conversations or workflows. The workshop introduces participants to relational event models in general, and the R-packages *relevant* and *goldfish*.

Part 3) Exponential Random Graph Models (ERGMs)

Date: Thursday 3 June 2021 (12:00-19:00 BST)
Instructor: Francesca Pallotti
Exponential Random Graph Models provide a means for assessing the statistical likelihood that an observed network is the product of a particular set of structural and actor attributes. It provides a means for testing hypotheses about complicated interdependent data. The workshop introduces participants to the general theoretical background of ERGMs; then it discusses more technical aspects such as model specification, estimation, goodness of fit, and parameter interpretation. Examples of empirical applications and hands-on exercises using *MPnet*.

Part 4) Multivariate Statistics with Network Data

Date: Friday 4 June 2021 (12:00-19:00 BST)
Instructor: David Dekker
This workshop lets you explore how permutation-based testing techniques can help assess different types of regression models for network data, including time-series and panel-data models. On completing this workshop you will have learnt:

- the fundamental assumptions of permutation based methods and their usefulness in network data analyses;
- a set of general models from the multiple-regression framework suitable for network data;
- the ability to assess the appropriateness of permutation testing;
- to use software to analyse multiple regression models with network data.

3) introduction to Data Science with Python

Dates: Tuesday 1 June - Friday 4 June 2021 (12:00-19:00 BST)

About:

The goal of the course is to provide attendees with a general overview of the field of data science, confidence in using a range of techniques for working with large datasets in practice, and insight into how it can be used in both scholarly and professional practice in the social, economic, managerial and political disciplines. Specific applications include network science, social media marketing, web mining and machine learning.

Requirements

All social science backgrounds are welcome, and participants are assumed not to have any previous knowledge of programming, the Python programming language. Participants will be introduced to elementary Python programming in the course of exploring each specialised application.

At the end of the course participants will be able to:

1. turn raw data from big datasets into actionable insights;
2. conduct a simple social media marketing analytics project;
3. scrape and mine information from websites and APIs;
4. implement machine learning models and interpret model results.

Part 1) Data Science

Date: Tuesday 1 June 2021 (12:00-19:00 BST)

Instructor: Nicola Perra

An introduction to the field of data science and the analysis of large datasets with the Python programming language. The unprecedented amount of data now available in many disciplines changed completely the way we look, understand and study the world and analyse digital traces of social behaviour. By the end of the workshop, participants will be able to:

- Communicate a demystified version of key concepts and terminologies around data science.
- Specify data science workflows, the resources involved and identify opportunities and challenges.
- Turn raw data into actionable insights and how data science can benefit your professional and organisational performance.
- Use mining and analysis techniques in Network Science.

Part 2) Introduction to Web Mining

Date: Wednesday 32June 2021 (12:00-19:00 BST)
Instructor: Nicolo Gozzi
This course introduces methods to access the huge amounts of data openly available as a result of widespread digitisation of information and the growth of open information and open science policies. By the end of the workshop, participants will be able to:

- understand the web technologies and information structure presented on websites
- scrape and mine information from websites and APIs
- transform unstructured text data into insights using Natural Learning Programming.

Part 3) Social Media Marketing

Date: Thursday 3 June 2021 (12:00-19:00 BST)
Instructor: Zhen Zhu
An introduction to marketing analytics, then continue with the process of extracting knowledge from customer data to inform marketing decision making, and finish with hands-on experience of implementing social media marketing analytics with Python. By the end of the workshop, participants will be able to:

- have a high-level understanding of social media marketing analytics concepts
- Understand how to divide a business problem into analytics tasks and which analytics model should be used for each task
- Understand the basic functionalities of APIs for major social media platforms and how to collect data from them
- Be able to conduct a simple social media marketing analytics project from concept to deployment using Python and machine learning

Part 4) Introduction to Machine Learning

Date: Friday 4 June 2021 (12:00-19:00 BST)
Instructor: Nicola Perra
The massive amounts of data now generated daily are increasingly beyond the capacity of traditional analytical methods to process. Machine learning models are increasingly being utilised to tackle the data tsunami. This workshop will introduce the fundamental concepts and algorithms of machine learning. By the end of the workshop, participants will be able to:

- Understand a collection of machine learning models and their applications in a range of fields.
- Identify appropriate machine learning models and apply them to specific problems
- Evaluate the performance of different machine learning models and justify their use and limitations
- Implement machine learning models and interpret model results

4) Introduction to Statistical and Network Analysis with R

About:
The goal of the course is to provide attendees with a confidence in basic programming in the R-programming language to manage data and to analyse it using a range of methods from elementary statistics, social network analysis, econometrics and multivariate statistics with network data.

Requirements
All social science backgrounds are welcome, and participants are assumed not to have any previous knowledge of programming, social network analysis or of any analytical or statistical software.

At the end of the course participants will be able to:

1. confidently write simple scripts in R to manage data and to apply specialised analytical packages
2. collate, manage and transform data programmatically;
3. summarise datasets using descriptive statistics and plots;
4. apply a range of analytical methods to a dataset and interpret the results;
5. understand the principles of elementary and advanced statistical and social network methods.

Part 1) Introduction to Social Network Analysis with R

Date: Tuesday 1 June 2021 (12:00-19:00 BST)
Instructor: Mathew Smith
An introduction to data management and analysis with the R-programming language with applications in social network analysis, using the R-package *sna*. By the end of the workshop, participants will be able to:

- Manage, transform and analyse data using efficient programable methods
- Write scripts to automate repeated tasks
- Analyse the principle characteristics of a social network dataset
- Visualise network data programmably.

Part 2) Introduction to Statistics with R

Date: Wednesday 2 June 2021 (9:00 – 17:00 BST)
Instructor: Mingming Cheng
An introduction to elementary statistical analysis using the R-programming language. Participants will learn how to manage small and medium-sized datasets, undertake basic descriptive statistics and plots and elementary statistical tests, quickly and simply in R, without the use of specialised statistical software packages.

Part 3) Introduction to Econometrics with R

Date: Thursday 3 June 2021 (9:00 – 17:00 BST)
Instructor: Mingming Cheng
An introduction to econometric methods, time-series and panel data analysis using the R-programming language. Participants will learn how to apply specialised R-packages to meet particular modelling requirements.

Part 4) Multivariate Statistics with Network Data

Date: Friday 4 June 2021 (12:00-19:00 BST)
Instructor: David Dekker
This workshop lets you explore how permutation based testing techniques can help assess different types of regression models for network data, including time-series and panel-data models. On completing this workshop successfully you will have learnt:

- the fundamental assumptions of permutation based methods and their usefulness in network data analyses;
- a set of general models from the multiple-regression framework suitable for network data;
- the ability to assess the appropriateness of permutation testing;
- to use software to analyse multiple regression models with network data.