Prof. Dr. Jens Vogelgesang · CSH Study Program Director · j.vogelgesang@uni-hohenheim.de

Registration now open for the

CSH Spring School 2023: Network Analysis

with Prof. Thomas Hills, University of Warwick
May 31 – June 2, 2023
HS 35, Fruwirthstr. 48, Kavaliershaus 4

The Computational Science Hub (CSH) of the University of Hohenheim offers a workshop on Network Analysis within the CSH Spring School 2023. Prof. Thomas Hills, University of Warwick, will provide you with the tools to apply network science and structural thinking to your own research. This entails the following points: 1) how to turn data into networks, 2) how to measure the properties of networks, 3) how to think about what these properties mean for your data, and 4) how to ask questions about your research from a network science perspective. Thomas Hills will provide an interactive format using Q&A and walking through R code. He will demonstrate various methods for visualizing network data and help you start thinking about how to use networks for more advanced topics such as statistics and simulation. Along the way, Thomas Hills will provide some history of network science in the social and physical sciences and introduce you to basic problems and illusions to help develop your thinking. Time will be provided to explore the application of network science to your specific research questions.

The schedule

(HS 35, Fruwirthstr. 48, Kavaliershaus 4)

Day 1 (May 31, 2023, 9h00 – 18h00):

1. Intro to structural problems in the behavioral sciences and what network thinking offers.
   (a) Opportunities for students to share research areas and questions.
   (b) Structural illusions in the behavioral sciences – some problems to get you thinking.
2. Basics of network science
   (a) How do I make a network out of my data? A thorough exploration of representing networks in R.
   (b) What can I measure with my network?
      i. A long list of things like degree, clustering coefficient, other centrality measures with some applications.
      ii. How to write a Science paper about history using one measure: degree.
   (c) Visualize your data.

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Day 2 (June 1, 2023, 9h00 – 18h00):

1. How does my network grow?
   (a) What's a null model for a network? How do I know if my network is special?
   (b) What principles may have generated this structure?
   (c) Random graphs, preferential attachment, preferential acquisition, forest fire models, etc.
2. How do I detect groups in my data?
   (a) Communities, cliques, and partitions
   (b) Clustering and modularity
3. Using networks with language data
   (a) Zipf's law in network science
   (b) Mental lexicons

Day 3 (June 2, 2023, 9h00 – 12h00):

1. Social network theory – why you should eat lunch with your co-workers.
2. Simulations – How can I make my network do stuff?

Target Audience

The course mainly aims at researchers in the early stages of their career, who plan to work empirically using network data. As such, the course is also open to Master students with sufficient knowledge of statistics and mathematics to follow the theoretical parts of the course.

Participants should be familiar with R and RStudio.

Fees, Devices and Credits

Students as well as staff members of the University of Hohenheim can participate **free of charge**.

Interested participants can register via weiterbildung.uni-hohenheim.de for the workshop until May 15, 2023.

For external participants the following tuition fee structure applies:

Group	**Through April 15** (prices in EUR)	**After April 15** (prices in EUR)
Students	80.00	100.00
PhD students / Staff Members	120.00	150.00
PostDocs	200.00	160.00
Professors	240.00	300.00

Outstanding fees have to be wired to the following bank account prior to the beginning of the workshop. An email with detailed payment instructions will be send to participants after registration and before the workshop.

Participants should bring their own laptop (incl. charger) with a working R and RStudio installation with them to follow the class.

At the end of the Spring School, participants will receive a certificate for the number of hours attended.

Contact

For any further information please contact:

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