



The Italian Econometric Society (SIdE) in collaboration with the Venice centre in Economic and Risk Analytics for Public Policies ([VERA](#)) Ca' Foscari University of Venice organizes the course for PhD students in:

Networks Econometrics

Venice, 28 June - 3 July 2020

Coordinator

Roberto Casarin
Dept. of Economics
University Ca' Foscari of Venice
San Giobbe 873/b
30121 Venezia, Italy
Office: Room A125
Phone: +39 041.234.91.49
Fax: +39 041.234.91.76
E-mail: r.casarin@unive.it
Web: <http://venus.unive.it/r.casarin/>

Lecturers

Monica Billio, Ca' Foscari University of Venice, <http://venus.unive.it/billio/>
Roberto Casarin, Ca' Foscari University of Venice, <http://venus.unive.it/r.casarin/>
Matteo Iacopini, Scuola Normale Superiore, Pisa <https://matteoiacopini.github.io/>
Sergio Petralia, London School of Economics <https://sergiopetralia.wixsite.com/research>
Luca Rossini, Vrije Universiteit Amsterdam, The Netherlands [//lucarossini.wixsite.com/luca-rossini](http://lucarossini.wixsite.com/luca-rossini)
Walter Quattrociocchi Ca' Foscari University of Venice,
<https://sites.google.com/view/walterquattrociocchi/home>

Requirements

Intermediate knowledge of statistical inference and econometrics.

Description

The aim of the course is to provide the fundamentals of the econometrics network with particular reference to the Network mapping and visualisation, the Network Extraction Methods, Multi-layer Network Models and their applications to finance. The tutorials will develop applications to stocks,

interest rates and commodities markets and to contagion analysis. Modelling of financial and commercial trade networks will be considered as well.

Course outline

1. Graph Theoretic Foundation of Networks

- 1.1 Definitions
- 1.2 Graph Connectivity
- 1.3 Multilayer-networks

Tutorial 1: Data scraping, Interactive geo mapping with R

Tutorial 2: Network mapping and visualisation with R

Tutorial 3: Text mining and Networks with R

2. Network Extraction Methods

- 2.1 Graphical Models
- 2.3 Parametric sparse regression models
- 2.4 Nonparametric sparse regression models

Tutorial 4: Extraction of Financial Networks in Matlab

Tutorial 5: Network visualization with Gephi

3. Temporal Network Models

- 3.1 Tensor decomposition
- 3.1 Dynamic Tensor Models
- 3.2 Markov-switching Tensor Models

Tutorial 6: Application to COMTRADE and Financial Networks in Matlab

4. Multi-layer Network Models

- 4.1 Definition and analysis
- 4.2 Extraction

Tutorial 7: Application to Oil Linkages Networks in Matlab

5. Stochastic-Block Models

- 4.1 Definition and inference
- 4.3 Application to Financial Networks

Reference textbooks and suggested readings:

Introductory references

Jackson, M.O. (2008) Social and Economic Networks, Princeton University Press.

Diebold, F. and Yilmaz, K. (2015), Financial and Macroeconomic Connectedness: A Network Approach to Measurement and Monitoring, Oxford University Press.

Bollobas, B. (1998), *Modern Graph Theory*, Springer.

Further references

Jensen, F. (1996), *An Introduction to Bayesian Networks*, Springer-Verlag

Lauritzen, S. (1996). *Graphical Models*, Oxford University Press

Pearl, J. (1998). *Probabilistic Reasoning in Intelligent Systems: Networks of Plausible Inference*.

Whittaker, H. (1990). *Graphical Models in Applied Multivariate Statistics*, John Wiley.

Articles

Ahelegbey, D. F., Billio, M., and Casarin, R. (2016), Bayesian Graphical Models for Structural Vector Autoregressive Processes, *Journal of Applied Econometrics*, 31, 357-386.

Ahelegbey, D. F., Billio, M., and Casarin, R. (2016), Structural Breaks In Volatility Networks: A Bayesian Approach, *Annals of Economics and Statistics*, 123/124, 1-30.

Bianchi, D., Billio, M., Casarin, R., Guidolin, M. (2019), Modeling Systemic Risk with Markov Switching Graphical SUR Models, *Journal of Econometrics*, 210(1), 58-74.

Billio, M., Casarin, R., Rossini, L. (2019), Bayesian Nonparametric Sparse VAR Models, *Journal of Econometrics*, 212(1), 97-115.

Billio, M., Getmansky, M., Lo, A. W., and Pelizzon, L. (2012), Econometric Measures of Connectedness and Systemic Risk in the Finance and Insurance Sectors, *Journal of Financial Economics*, 104, 535-559.

Casarin, R., Iacopini, M., German, M. and Ter Horst, E., Espinasa, R., Sucre, C. and Rigobon, R. (2019), Multilayer network analysis of oil linkages. *Econometrics Journal*, forthcoming.

Tutorials

Theoretical lectures are associated with working sessions; during them you will receive the suggestions needed to use an econometric software and to run your own empirical analysis.

Data-sets and programming files to make applied econometrics will be provided during the lectures.

For the practical tutorials and applications participants will use the softwares R, Matlab and Gephi, which will have to be installed on their own laptops.

Venue

The course will be held in the Campus Economico San Giobbe at Università Ca' Foscari, Venezia, Italy. Address: Dipartimento di Scienze Economiche - S. Giobbe, 873 - 30121 Venezia. Participants will be hosted in the Ca' Foscari Residence in Santa Marta (as an exception, in case of reduced availability of rooms they will be accommodated in local hotels).

Timetables

Each Module requires full-time attendance, and participation is not compatible with other jobs at the same time (e.g. preparation of other exams). Lectures and tutorials will be in English, with the following schedule (provisional):

Monday to Friday: lectures: 9.00-13.00, 15.00-17.00 (18.00).

Fees and Enrollment

Fees:

Students, new graduated students, PhD students and temporary university staff: 690€

University staff: 800€

Others: 2300€

Fee includes: accommodation (usually in double room with breakfast and lunch starting from Sunday evening).

Participants who wish to attend two or three Courses, are allowed the following reduced fees per Course:

-Students, new graduated students, PhD students and temporary university staff: 590€ per Course

-University staff: 700€ per Course

-Others: 2000€ per Course

Fees for Master and PhD students from Ca' Foscari University of Venice : 30€

Fee for students from Ca' Foscari University of Venice does not include accommodation.

Master and PhD students from Ca' Foscari University of Venice who wish to attend two or three Courses, are allowed the following reduced fees per Course:

- Two Courses in Venice and one or more Courses in Bertinoro: 30€ per Course in Venice + 590€ per Course in Bertinoro

Enrollment

SIde courses and summer schools are open to scholar and practitioners of all levels, but are particularly aimed at junior researchers and PhD students. The only requirement is SIde membership (annual fee 60 Euro). Regular members of SIde are admitted upon application to the Steering Committee. Together with the application to SIde, prospective regular members give their consent to the distribution of their CV and list of publications, in the spirit of disclosure of research in econometrics stated in the goals of SIde. The interest in econometrics is identified by the curriculum of studies and/or the scientific or professional career.

How to apply:

Go to <http://www.side-iea.it/become-member> and provide personal details (name, affiliation), and upload your CV (pdf file, max 2 Mb). Once your application is validated, you will receive a link to a payment gateway for the collection of membership dues. Once the payment is confirmed by our Staff, you will receive a username and password to login into your personal profile and access to restricted contents and the Enrollment procedure

Important dates:

Application Deadline: April 18th, 2020

Deadline for Fee Payment is May 16th 2020

Contacts

For more information: Antonella Mallus e-mail: info@side-iea.it

For administrative issues:

Alessandra Picariello phone: +39 0512092637; e-mail: alessandra.picariello@unibo.it

For travel and accommodation: Marianna Morelli phone +39 041 234 9254; e-mail: vera@unive.it

Sponsors:



Ca' Foscari
University
of Venice

Department of Economics



Venice centre in Economics
and Risk Analytics for public policies