Course of the SIS'School

Foundations of Info-Metrics and Information-Theoretic Mehods of Inference

Bologna, January 8 – 9 2018

Department of Statistical Sciences
Universty of Bologna

Società Italiana di Statistica
Salita de' Crescenzi, 26
00186 Roma

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Scuola *della* Società Italiana di Statistica

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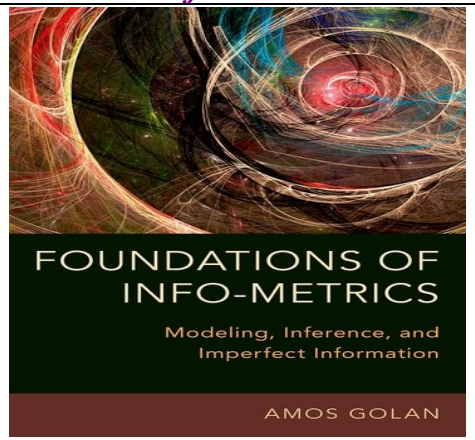

Golan, Foundations of Info-Metrics, Oxford U Press (2018),https://global.oup.com/academic/product/foundations-of-info-metrics-9780199349524?q=info-metrics&lang=en&cc=us

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Info-metrics is the science of modeling, reasoning, and drawing inferences under conditions of noisy and insufficient information. The course **"*Foundations of Info-Metrics and Information-Theoretic Mehods of Inference*"** concentrates on modeling and statistical inference of problems in the sciences in general and in the social sciences in particular. The fundamental problem of inference with very little, or noisy information (or other type of complex data) is a common problem across the sciences. Further, in most cases we also don't know the underlying model or the underlying statistical process. Info-metrics provides a framework for solving such ill-behaved problems with minimal assumptions and structure. The methods we will study and explore include the complete 'family' of methods known as Information-Theoretic (IT) methods of inference. Throught the course we will compare the info-metrics approach with the more traditional methods. The course will be composed of lectures, open discussions, and complementing exercises. The exercises and computer practice will allow each participant to gain the most out of this tutorial where a substantial amount of practice and computing is necessary. Different software, such as Matlab, GAMS, Python, R, etc. can be used. For those who wish to use common statistical/econometric software, most of the methods we discuss in this tutorial can be used within some of the main software packages, such as STATA, SAS and NLOGIT (LIMDEP). The basic

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codes will be provided to the participants. STATA and SAS examples will be provided as well.
The course is beneficial to graduate students, researchers and academics from across disciplines. The background and pre-requisite needed for the tutorial is statistics and/or econometrics. The course will be held in English.

Location:
Department of Statistics,
University of Bologna, Via Belle Arti, 41 40126 Bologna

For the application form please visit SIS web page http://www.old.sis-statistica.org/index.php?module=corsi
The deadline for online application is **December 3, 2017**. The Scientific Committee will examine the applications and on the basis of the dates of the applications and CV (rossella.bernardini@unibo.it) will decide the admission. The attendance to the course is subject to the payment of the participation fees indicated below.

		before 20/12/17	**after 20/12/17**
Partecipanti non iscritti alla SIS*		500	600
Ordinary SIS Members	Ordinary SIS Member	200	250
	Ordinary SIS Member *Under 35 years old*	120	170
Institution belonging to SIS	Employee belonging to SIS	200	250
	Employee not belonging to SIS	400	500

* Values without added tax (VAT)
*Additional details also related to scholarships will be provided at the following link:
https://events.unibo.it/Info-Metrics-STAT-Bo2018

	Morning (9.30 – 12.30)	**Afternoon (14.00 - 17.00)**
Monday, 8 January	• Tutorial introduction • The metrics of info-metrics • Entropy maximization • Experimenting with maximum entropy (and individuals' experiments on their own laptops) *(Amos Golan)*	• Entropy maximization (Continue) • Priors • The info-metrics framework – stochastic moments – Background (Theory) *(Amos Golan)*
Tuesday, 9 January	• The info-metrics framework – stochastic moments (Continue; Theory, Graphical Analysis and Computer Experiments) • Information-Theoretic methods part I – Discrete Choice (Theory) *(Amos Golan)*	• Information-Theoretic methods part I – Discrete Choice (Theory - Continue) • Information-Theoretic methods part II – Continuous (Theory) • Summary of material • Questions and Answers: Topics as dictated by student interests and current concerns in research. This will include open meeting/discusssion with individuals or group projects as well as modeling and data problems. We will have computer lab as dictated by interests. *(Amos Golan)*