



Bocconi Summer School in Advanced Statistics and Probability: Statistical Causal Learning

Lake Como School of Advances Studies

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The Bocconi Summer School in Advanced Statistics and Probability is offered by Università Bocconi, Milan, and is hosted by the Lake Como School of Advanced Studies at Villa del Grumello, on the shores of the Lake of Como, usually in July.

Its first edition, on Statistical Causal Learning, will take place on July 10-22, 2017

The aim of the Bocconi Summer School in Advanced Statistics and Probability is to establish a track of high level courses on advanced and cutting-edge topics in Statistics and Probability. The Summer School will feature lectures delivered by internationally leading scholars on the designated topic, and supervised tutorials.

The School continues the tradition of the Summer Schools in Statistics and Probability that Bocconi University had been organizing since the early '90s, and held in Torgnon, Val d'Aosta, until 2008.

Directors

Prof. Sonia Petrone (Bocconi University) Prof. Pietro Muliere (Bocconi University)

PhD Università Bocconi.





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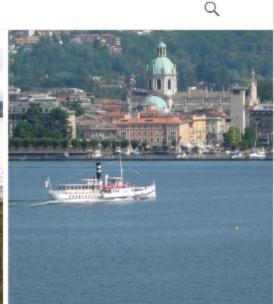
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Application

Target Participants

The Summer School is designed for PhD students, and possibly brilliant MSc graduates / final-year students interested in pursuing doctoral studies in Statistics, Probability, Computer Science, Applied Mathematics, Operation Research and related areas

Lectures are in English.

In order to foster active interaction among students and instructors, the School is targeted for a class of at most 30 qualified and selected participants.

The class group will include some students of the PhD in Statistics of Università Bocconi.

Selection criteria

Selection of the participants will be mainly based on the quality of the curriculum. The Organizing Committee will also consider other relevant aspects of candidates' application such as: the coherence of the motivation with the aim and scope of the school, the potential benefit for the student's research and the timeliness for the development of the student's career.

Required documents for applying:

1) Personal CV:

Education, work experience, language skills and other relevant info.

2) Academic records:

- for PhD students: PhD exams transcript (if applicable)
- for MSc students and graduates: transcript of MSc exams

3) Referees:

Up to 2 referees' contact details (name, institution and e-mail address)

4) Statement of purpose:

Short description of (max 1200 words):

- academic background in statistics, probability and/or other related areas
- research interests
- motivation for participating in the Summer School

INAITIE
Surname
Gender
Institution
Street
Postal zip code
City
Country
Telephone number
E-mail address
Referees

Curriculum vitae (2 pages) [pdf, max 2MB]

Scegli il file Nessun file scelto

Academic records Transcript (2 pages) [pdf, max 2MB]

these details at any time and request their modification and cancellation.

Statement of purpose (2 pages) [pdf, max 2MB]

Scegli il file Nessun file scelto

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☐ By submitting this application form you authorise Fondazione Alessandro Volta to include your personal data on its mailing list for the distribution of information material. In accordance with the Law 196/2003, you may have access to

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 For info, contact bss.statistics@unibocconi.it





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Important Deadlines

- Closing date for application: by April 7, 2017
- Notification of admission: by April 22, 2017
- Registration of admitted candidates: by May 7, 2017

All applicants will be notified via e-mail about their admission result (i.e.: admitted in the main list, in the waiting list, or not admitted due to excess demand). Should any place become available, candidates in the waiting list will be soon notified by email.





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Program

Statistical Causal Learning

In machine learning, we use data to automatically find dependences in the world, with the goal of predicting future observations. Most machine learning methods rely on statistics, and we will both discuss the theory underlying statistical learning as well as kernel machines building upon the theory.

However, statistical dependencies arise due to a more fundamental connection between variables: causality. Can causal knowledge help prediction in machine learning tasks? We argue that this is indeed the case, due to the fact that causal models are more robust to changes that occur in real world datasets. We provide some theoretical results as well as algorithmic approaches, and we touch upon the implications of causal models for machine learning tasks such as domain adaptation, transfer learning, and semi-supervised learning. Some of the causal problems are conceptually harder, however, the causal point of view can provide additional insights that have substantial potential for data analysis.

Time permitting, we will also present an application of causal modeling to the removal of systematic errors for the purpose of exoplanet detection.

Instructors

Bernhard Schölkopf

(Empirical Inference Department Director, Max Planck Institute for Intelligent Systems, Tübingen);

Ilya Tolstikhin

(Research Scientist, Max Plank Institute for Intelligent Systems, Tubingen);

David Lopez-Paz

(Researcher at Facebook Al Research, Paris)

Format

Morning: 3 hours/day lectures

Afternoon: 2 hours/day supervised tutorials as well as individual and team work.

Room and board

Accommodation is included in the registration fees.

Students will be hosted at the Guest House of Villa del Grumello, and in other facilities in the surroundings.

The organizers of the Summer School will take care of the reservations

Working days' lunches are included in the registration fees, while dinners are not.

Attendance and final certificate

Full attendance of the activities of the summer school is mandatory for the participants

An attendance certificate will be awarded by Università Bocconi, subject to a positive participation to the program.





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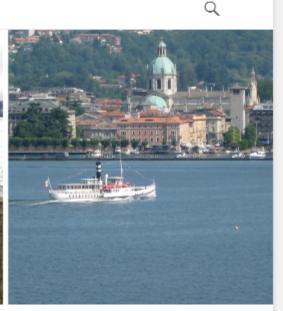
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Registration

Registration fee: € 450 (VAT free)

The fee covers the school activities and course material; wi-fi connections; lunches and accommodation for the 2 weeks (July 9 – July 22, 2017)

Admitted applicants on the main list register by accessing the "Paytool - registration area"

Deadline closing date for application: April 7, 2017 Notification of admission: by April 22, 2017 **Registration of admitted candidates: by May 14, 2017.** "Registration is confirmed only upon filling in the Paytool registration form and payment of the registration fee."

Should any candidates in the main list decline the offer, candidates in the waiting list will be notified by email so that they can register.

Upon registration, participants will be notified about their accommodation.

BIDSA fee-waivers

The Bocconi Institute of Data Science (BIDSA) will confer up to two Awards, covering the registration fee, to outstanding applicants.





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Schedule

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Date	I	Morning	1	Afternoon		Lecturer	ı	Instructor	
Monday Tuesday Wednesday Thursday Friday	11/07 12/07 13/07	Introduction to learning theory Learnability of finite classes Binary classification, VC dimension Beyond classification Kernel Algorithms		Basics of math, recap Blackboard theory exercises Blackboard theory exercises Introduction to RKHSs Kernel Mean Embeddings		Ilya Ilya Ilya Ilya Bernhard		Ilya Ilya Ilya Bernhard Bernhard	
Monday Tuesday Wednesday Thursday Friday	18/07 19/07 20/07	Introduction to causality Bivariate causal discovery Multivariate causal discovery Potential Outcomes Invariant causal prediction		Introduction to PyTorch Prediction challenge Bivariate Causal Discovery Potential Outcomes Causality challenge		Bernhard Bernhard David David David	:	David David David David David	.





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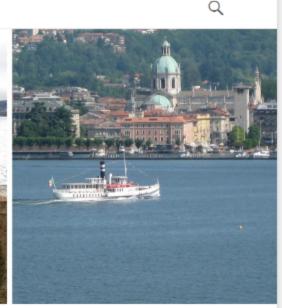
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Venues And Accommodation

Course Location:



Lake Como School of Advanced Studies, Villa del Grumello, Como, Italy. Placed in a central position within Europe, close to four international airports, it is hosted in an outstanding old noble palace located on the shoreline of beautiful Lake Como. The School is an international research facility running short term programmes on a wide range of interdisciplinary subjects, sharing a common focus on complex systems. The School attracts leading scholars in different fields including: physics, biology, economics, sociology,

geopolitics, education, environmental and development studies, to engage in collaborative research. In small teams, visitors explore questions at the cutting edge of science and knowledge. In a context of globalization and in front of the increasing interaction between various kinds of networks, the analysis of complex systems offers insights into economic development, social cohesion and the environment on many geographical scales.

Venue The school will be held at Villa del Grumello, Via per Cernobbio 11, Como (Italy).

HOW TO GET THERE: http://lakecomoschool.org/contact/travel-info/

Villa del Grumello is 20 min on foot from Como city center – you can also take a bus, lines 6 and 11 (bus stop: "Como Via Regina Piscine Villa Olmo", just after "Villa Olmo").

From the main Train Station (Como S. Giovanni), the nearest bus stop to catch line 6 and 11 is "Piazzale Rocchetto".

