



Lipari School

Lipari International Summer School on BioInformatics and Computational Biology

Statistical and Machine Learning Methods in Computational Biology

June 12 - June 19, 2010

<http://lipari.cs.unict.it/LipariSchool/Bio/index.php>

Deadline: April 10, 2010

(Admission notification will start on March 1st according to registration time)



Aim and scope: The theme of the School: Statistical and Machine Learning Methods in Computational Biology is among the most representative areas of interdisciplinary research in modern science. It has also a very long and prestigious history of fundamental contributions to biology and medicine. However, since high throughput and genome wide experiments are becoming a standard for biological investigation, new techniques for the analysis of biological data are required. The main lectures will focus on four aspects of the theme, ranging from new statistical challenges posed by deep sequencing techniques to inference and analysis of network structure that take into full account the paradigm shift that we have witnessed in terms of the scale of data available. A series of tutorial is also offered, with the intent to complement the main lectures by providing snapshots of other areas that are perceived of relevance to the theme of the School. They range from introductory topics to Statistics to probabilistic and Machine Learning methods used to shed light on nucleosome organization in genomes. As it is clear from the enclosed bibliography, the selected themes have received much attention in the scholarly literature that ranges from Science to BMC Bioinformatics and Bioinformatics. As a whole, the planned summer school will allow young researchers interested in bioinformatics and biomedicine to be exposed to cutting edge results in an area that, although classic, is among the most effervescent in Post-Genomic Biology.

Courses

- **Sandrine Dudoit**
Statistical Challenges in mRNA-Seq
University of California, Berkeley, USA
- **Charles Lawrence**
Statistical Inference in Genomics
Brown University, Providence, USA
- **Dana Pe'er**
Computational Learning Methods and Biological Networks
Columbia University In the City of New York, USA
- **Marie France Sagot**
Metabolic Networks and Their Structural Analysis
Université de Lyon and INRIA Rhone Alpes, France

Guest lectures

- **Mary Ellen Bock**
Statistical Challenges in the Analysis of Massive Datasets in Bioinformatics
Purdue University, West Lafayette, IN, USA
- **Gene Myers**
Bioimaging Informatics
HHMI Janelia Farm Research Campus, Loudoun County, Virginia, USA

Tutorials

- **Catarina Sismério**
A Primer of Statistical Techniques
Imperial College, London, UK
- **Gene Myers**
Deep Sequencing Technology and Its Applications
HHMI Janelia Farm Research Campus, Loudoun County, Virginia, USA
- **Michael Levitt**
TBA
Stanford University, USA
- **Silvio Bicciato**
An Overview of Statistical Tests for the Identification of Differentially expressed genes
University of Modena and Reggio Emilia
- **Alfredo Pulvirenti**
Two and Multiple Sequence Alignment
University of Catania, Italy
- **Matteo Comin**
Phylogenetic methods for biological sequences
University of Padova, Italy
- **Raffaele Giancarlo**
Computational Cluster Validation for Post Genomic Data Analysis
University of Palermo, Italy
- **Giosuè Lo Bosco**
Machine Learning Methods for Nucleosome Positioning
University of Palermo, Italy
- **Rosalba Giugno**
Network Analysis Systems for Biomedical Applications
University of Catania, Italy

Participants will be arranged in a comfortable hotel at very special rates. The conference room (in the same hotel) is air-conditioned and equipped with all conference materials. Special areas are reserved to students for the afternoon coursework and study. The island of Lipari can be easily reached from Milazzo, Palermo, Naples, Messina and Reggio Calabria by ferry or hydrofoil (50 minutes from Milazzo).

Two kinds of participants are welcome. Students: Participants who are expected to do afternoon courseworks and take a final exam (The grades will be given following the [ECTS grading scale](#)). Auditors: participants who are not interested in taking the final exam. Registration fee is 450 Euros. The fee covers the course material, bus+hydrofoil Catania airport-Lipari-Catania airport, 1 social tour (Salina) and the social dinner on the beach of Vulcano. Late registration is 550 Euros.

Deadline for application is **April 10, 2010** (Admission notification will start on **March 1st** according to registration time). Applicants must include a short curriculum vitae and specify two professors whom letters of recommendation will be asked to, if deemed necessary. Applicants will be notified about admission by April 20, 2010.

For late-registrations the Bank transfer fax must be sent before June 1.

The official language is English.

School Directors

- **Prof. Alfredo Ferro** (*University of Catania*)
- **Prof. Raffaele Giancarlo** (*University of Palermo*)
- **Prof. Concettina Guerra** (*University of Padova and Georgia Tech.*)
- **Prof. Michael Levitt**, (*Stanford University*)

- **Dr. Rosalba Giugno** (*co-director, University of Catania*)
- **Dr. Alfredo Pulvirenti** (*co-director, University of Catania*)

People interested in receiving further information about the school can contact:

Lipari School Organization

Prof. Alfredo Ferro -- Susanna Caramello (Lipari School secretary)

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