

Third International School on Open Science Cloud

Second Bulletin, July 2019

School Information

The theme of the 3rd edition of the international School on Open Science Cloud is “**Intelligent Systems**”. The school will be held in Bologna on 16-20 September 2019 and is organised by INFN, the Department of Physics of the University of Bologna, the Department of Physics and Geology, and the Department of Economics of the University of Perugia.

The School is multi-disciplinary and targeted at postgraduate researchers including bachelor degree or equivalent in fields such as physics, statistics, computer science, computer vision, biology, medicine, engineering working at any research institute, with experience in data analysis, in computing or in related fields. We welcome applications from all nationalities, and encourage all qualified persons to apply.

Academic Program

The programme is organized over two tracks: **Statistical/Machine Learning Methods and Applications** and **Computing infrastructures**. The school is structured in lectures and hands-on sessions. The program for the hands-on sessions foresees that students will also develop Individual projects during the weeks.

Lectures will start with **introductory sessions on the three pillars of the school: Statistical Learning, Intelligent Algorithms and Intelligent Infrastructures**.

They will be followed by a comprehensive overview of the main **ML/DL models**, with a focus on their usage in the physics domain.

Resampling methods for model evaluation and prediction, such as cross-validation and bootstrap, will then be introduced.

As part of the school program there will be a special seminar given by Trevor Hastie (Stanford University) on Wednesday morning, hosted at the University of Bologna.

The program will then continue with its second track on **Computing Infrastructures**, which will focus on concepts such as **Containers**, their **Composition** on single hosts as well as on distributed clusters and their **Orchestration** through solutions such as Kubernetes and Mesos. Theory and hands-on sessions will then deal with the **Function as a Service paradigm** and with **data streaming analytics** applied to cloud infrastructures. The computing infrastructure track will then wrap up with advanced scenarios addressing applications and service composition through **Template-based orchestration over hybrid Clouds**.

The hands-on exercises on most of the topics addressed during the lectures will allow students to learn and verify advanced concepts related to modern software ecosystems for Data Science and application management in container-based distributed infrastructures.

A key feature of SOSC is the development of personal projects based on **mini-kaggle competitions** (with supervision), including advanced **exercises on image classification both on GPU and Google's TPUs**.

During the hands-on sessions, students will use, among others, Jupyter notebooks, NumPy, Pandas and Matplotlib, as well as few of the commonly used frameworks and libraries for ML/DL (e.g. scikit-learn, Tensorflow, Pytorch), together with tools like docker, docker-compose, TOSCA, Kubernetes, Mesos, and others.

A [detailed agenda](#) is available.

SOSC Certificate and Diploma

An **attendance certificate** will be issued to the students attending the whole school programme.

Moreover, the school will provide an **official SOSC School of Computing diploma** upon successful completion of a project-based final test that will take place towards the end of the school.

Important Dates

September 5 2019 application deadline

- **30 July:** Early bird €150 -
- **5 September:** Full ticket €250 -
- **16 September:** School start

If you have any issues with the registration or the payment please contact sosc19-pc@lists.infn.it

Venue

CNAF, Centro nazionale dell'INFN per la ricerca e lo sviluppo nelle tecnologie informatiche e telematiche.

Viale Berti Pichat 6/2 40127, Bologna, Italy