WebValley
19th edition

WebValley 2019
Casez di Sanzeno
June 16 - July 6 2019

WebValley is the international FBK summer school for data science and AI-based interdisciplinary research

The school runs in a tech lab, set up by FBK in a cozy village in a scenic valley of Trentino, in the Italian Alps. The WebValley Lab provides computing resources and devices to test new ways of exploring the principles of applied data science and predictive models. Students joining the school work in a lively and interactive environment together with a group of selected experts, also interacting through teleconference with other labs. **More than 350 students (17-19y old) have attended the WebValley camps since its first edition in 2001,** as true protagonists of a challenging research project.

Full (including travel) and partial fellowships are sponsored by FBK, the FBK Trustees Board, and partner organizations, covering full tuition, accommodation, leisure time activities, and local travel costs. Each year, the team includes students from Trentino, nationals and internationals.

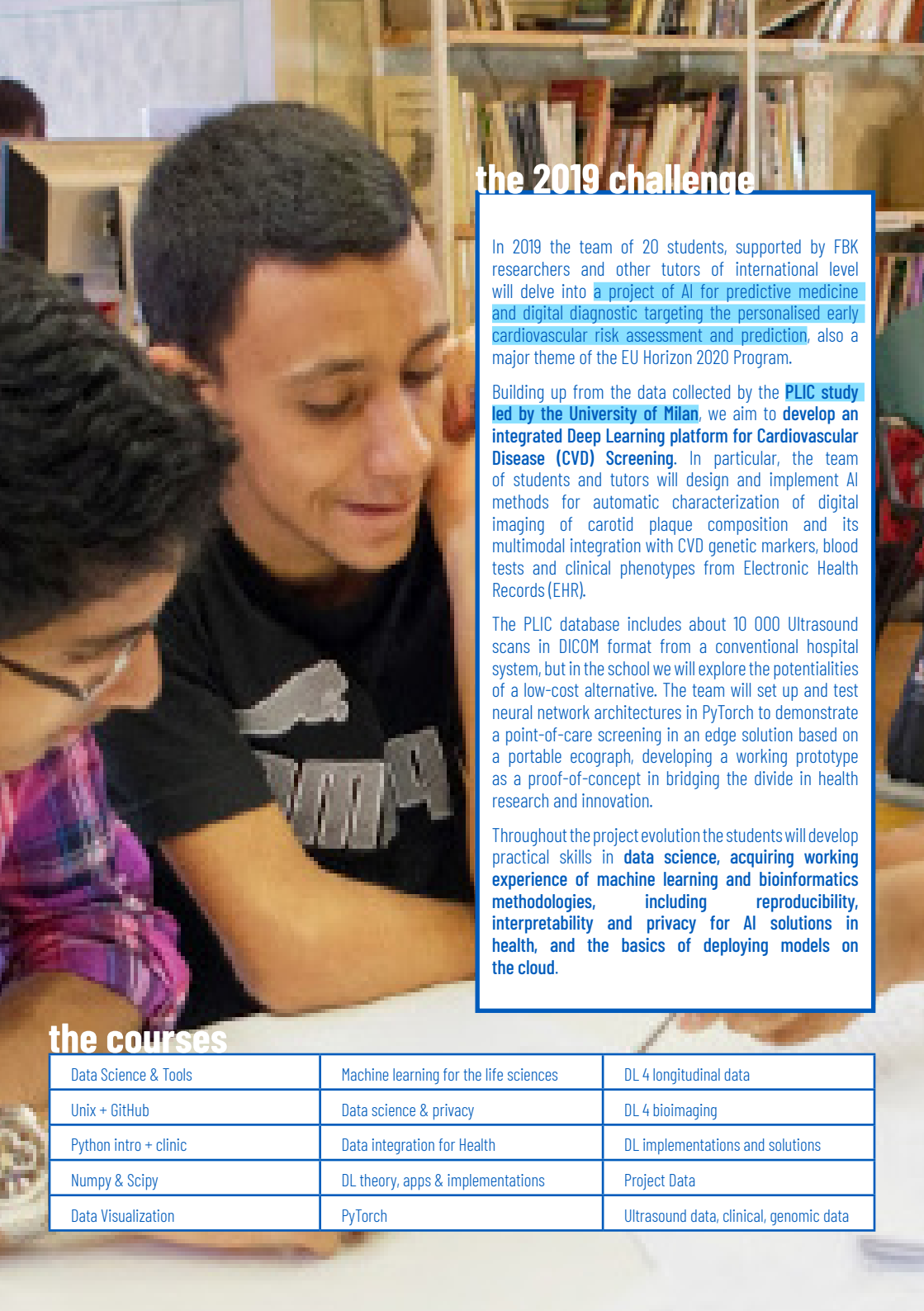
The requirements to participate are:

- High School student (for Italy: 4th year completed)
- Good knowledge of English
- Enthusiasm in science and new technologies
- Above-average school records
- 2 letters:
  1 Student Motivation letter and
  1 Teacher's Recommendation letter

THE GOALS

- Encourage smart students to be entrepreneurs in science
- Interdisciplinarity
- Transform internet into an innovation building environment
- Develop teamwork, collaboration, fast-prototyping attitudes

- Use sophisticated open source methods in an informal teaching environment
- Expose to challenging research themes of strong ethical interest
- Using high quality data from scientific or statistical institutions
- Promote the adoption of standard formats and share data policies



the 2019 challenge

In 2019 the team of 20 students, supported by FBK researchers and other tutors of international level will delve into a project of AI for predictive medicine and digital diagnostic targeting the personalised early cardiovascular risk assessment and prediction, also a major theme of the EU Horizon 2020 Program.

Building up from the data collected by the **PLIC study led by the University of Milan**, we aim to **develop an integrated Deep Learning platform for Cardiovascular Disease (CVD) Screening**. In particular, the team of students and tutors will design and implement AI methods for automatic characterization of digital imaging of carotid plaque composition and its multimodal integration with CVD genetic markers, blood tests and clinical phenotypes from Electronic Health Records (EHR).

The PLIC database includes about 10 000 Ultrasound scans in DICOM format from a conventional hospital system, but in the school we will explore the potentialities of a low-cost alternative. The team will set up and test neural network architectures in PyTorch to demonstrate a point-of-care screening in an edge solution based on a portable ecograph, developing a working prototype as a proof-of-concept in bridging the divide in health research and innovation.

Throughout the project evolution the students will develop practical skills in **data science, acquiring working experience of machine learning and bioinformatics methodologies, including reproducibility, interpretability and privacy for AI solutions in health, and the basics of deploying models on the cloud**.

the courses

Data Science & Tools	Machine learning for the life sciences	DL 4 longitudinal data
Unix + GitHub	Data science & privacy	DL 4 bioimaging
Python intro + clinic	Data integration for Health	DL implementations and solutions
Numpy & Scipy	DL theory, apps & implementations	Project Data
Data Visualization	PyTorch	Ultrasound data, clinical, genomic data

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special events

20th June
AMBIENTE, STILI DI VITA E RISCHIO CARDIOVASCOLARE
Alberico L. Catapano, Professor of Pharmacology (University of Milan)

26th June
WEBVALLEY: L'AGRICOLTURA A COLLOQUIO CON L'INTELLIGENZA ARTIFICIALE
Chairman: Giannantonio Armentano
Fausto Milletarì (Nvidia), Cesare Furlanello, Luca Coviello (Fondazione Bruno Kessler), Stefano Corradini (Fondazione Edmund Mach), Steno Fontanari (MPA Solution), Marco Baldo (Biogard)

5th July
FINAL PRESENTATION
WebValley Team

special thanks to

FBK Board of Directors
Trentino Digitale
US Society for Science - INTEL ISEF
APT Val di Non
Comunità della Val di Non
Comune di Sanzeno
NVIDIA
DIBRIS - Università degli Studi di Genova
University of Milan
University of Trento
Orobix
Cassa Rurale Val di Non
HIT Hub Innovazione Trentino Fondazione
Ist. Rainerum | Salesiani Don Bosco
Ist. Pavoniano Artigianelli per le Arti grafiche

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PROVINCIA AUTONOMA DI TRENTO
FONDAZIONE BRUNO KESSLER

the formula

The team accepts a challenge by a collaborating scientist from Ecology, Biology or Social Sciences and develops in three weeks a new web-based prototype for data analysis and management in relation to a problem of ethical interest.

Students are introduced to Open Source software tools (scientific programming, web-mobile interfaces, databases, data analysis and visualization); they discuss, design and develop the new system interacting with scientists. They learn to select tools, organize their own work plan, and respond with a new solution. A working prototype solution and technical results are presented at the end of the three weeks period.

The project activities are developed mostly in teamwork as in a true research environment, that is informal and of high quality in resources, competence and organization. Each student can differently contribute to the project with ideas, software code or data preparation, design of new web interfaces, and project presentation.

The location: the school is held in **a high-tech lab located in a small Alpine village**, to demonstrate that web access may support new types of innovative actions also in remote areas, thus combining new technologies and high-quality of life in a natural environment.

Lab is open all day, but group activities and leisure time are also part of the three weeks course.

contacts

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