

# Artificial Intelligence, Deep Learning & Healthcare

## Facilitators

- **Francesca Faraci, PhD, Group Leader** (SUPSI/DTI/MeDiTech/BSP)
- **Luigi Fiorillo PhD** (SUPSI/DTI/MeDiTech/BSP)
- **Davide Marzorati PhD** (SUPSI/DTI/MeDiTech/BSP)

Other research assistants will support during the practical exercises.

## Description

This course will give a broad overview of the potentials and limitations of machine learning and deep learning applications in healthcare, with a focus on clinical data exploitation. After providing an overview of the pros and cons of different approaches, and a list of examples of their application, the student will learn the basics of using Python for data analysis, machine learning and deep learning. Data management and ethical issues will shortly be presented from different perspectives. Application in Healthcare domain, including public health, will be presented and discussed. Throughout the course, the theoretical insights acquired from the lectures will be applied to a specific use case, starting with descriptive statistics, followed by regression analysis and explainable machine learning models using clinical features, up to a deep learning model.

The course is meant for a generic audience that includes both data scientists, biomedical engineers and clinicians, physicians that are interested in expanding their knowledge.

## Objectives

By the end of the course, students will be able to run a typical Python project: import data from text or Excel files, perform data manipulation (including use of labels), save manipulated data, perform statistical analysis, graphical representation of the data. Students will also be able to execute a script with basic examples of type of data classification.

<b>Dates</b>	<b>16 September - 20 September 2024</b>										
<b>Eligibility</b>	SSPH+ IGC students, external PhD students and other participants are welcome for limited places.										
<b>Course Structure</b>	<p>Lectures, case study analysis and practical exercises. Students will be given continuous support, during practical exercises, accordingly on their programming skills.</p> <p>Students will receive predefined scripts and data to practice with, and are encouraged to present their own research problem/possible application.</p> <p>The course is divided equally in theoretical and practical work. The theoretical part, will be supported by videos and SoA publications analysis, whilst during the practical part supervised laboratory activities are foreseen.</p>										
<b>Assessment</b>	Continuous self-assessment with short surveys and interactive-quizzes. At the end of the course a short exam needs to be completed. The results will be openly discussed.										
<b>Credits</b>	<p><b>2 ECTS</b></p> <p>Preliminary Work: 2-6 h; Contact time: 38 h; In-course work: 20 h; Wrap-Up Work: 1 h</p> <p>(1 ECTS corresponds to appr. 25-30 hours workload)</p>										
<b>Location</b>	ONLINE										
<b>Course Fees</b>	<table border="1"> <thead> <tr> <th>IGC course fees</th> <th>2 ECTS</th> </tr> </thead> <tbody> <tr> <td>SSPH+ IGC Students</td> <td>30 CHF</td> </tr> <tr> <td>Postdocs from partner universities</td> <td>30 CHF</td> </tr> <tr> <td>External PhD students and MD students</td> <td>600 CHF</td> </tr> <tr> <td>Others</td> <td>1'600 CHF</td> </tr> </tbody> </table>	IGC course fees	2 ECTS	SSPH+ IGC Students	30 CHF	Postdocs from partner universities	30 CHF	External PhD students and MD students	600 CHF	Others	1'600 CHF
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**Registration** | <https://www.conftool.com/ssph-phd-courses2024/>

**Deadline for registration** | 16 August 2024