

ESSO Course on Artificial Intelligence in Healthcare: Hands on Workshop for Surgeons and Radiologists

Milan, Italy

9th to 10th May 2025

Chairs (physicians)

Giuseppe Catanuto, Humanitas University -Istituto Clinico Catanese Misterbianco, IT
Pedro Gouveia, Champalimaud Foundation, Lisbon, PT

Chairs (technicians)

Tiago Marques, Champalimaud Foundation, Lisbon, PT
João Santinha, Champalimaud Foundation, Lisbon, PT

Faculty members

Savero D'Amico, Humanitas Research Hospital, Milan, IT
Cesare Hassan, Humanitas Research Hospital, Milan, IT
Nada Mansour, Humanitas Research Hospital, Milan, IT
Aldo Marzullo, Humanitas Research Hospital, Milan, IT
Paolo Oliva, Humanitas Research Hospital, Milan, IT
Federico Pollio, Humanitas Research Hospital, Milan, IT
Marta Ranzini, Humanitas Research Hospital, Milan, IT
Alessandro Repici, Humanitas Research Hospital, Milan, IT
Elena Zazzetti, Humanitas Research Hospital, Milan, IT

Program

Friday 9th May

08:40 – 09.00 Welcome and introduction
L. M. Terracciano (Humanitas University rector)

Topic 1 - Artificial intelligence/Large language models

09.00 – 09.15 Basics of machine learning and deep learning
T. Marques

09:15 – 09.30 Introduction to Python, Jupyter, and Google Colab
T. Marques

09.30 – 09.45 Datasets, and best practices to train AI models
S. D'Amico

09.45 – 10.00 Large language models in healthcare
P. Gouveia

10:00 -10:30 *Coffee Break*

10:30 – 11.00 A story of success in artificial intelligence and healthcare
A.Repici, C. Hassan

11:00 – 13.00 **Hands on session**
11.0 – 12.00: Elementary coding, *T. Marques*
12.0 – 13.00: Exercise on imaging segmentation tools (CF),
J. Santinha

13.00 – 14.00 *Lunch break*

14.0 – 16.00

Hands on session

- AI applications in healthcare, *S. D'Amico*
- Synthetic data generation applied to a breast cancer use case (basics of synthetic data generation and how to create synthetic data on an oncology use case), *S. D'Amico, E. Zazzetti*
- Anomaly detection through clinical imaging to support cancer diagnosis and treatment, *M. Ranzini, A. Marzullo*

Saturday 10th May

Topic 2 - Imaging-Augmented reality-Virtual reality-3d printing

08.00 – 08.15

Glossary of augmented reality and virtual reality (devices-current applications-developments)
T. Marques

08.15 - 08.30

Basics of CAD\CAM- 3d printing
P. Oliva

08.45 - 09.00

3D slicer + Creating 3D digital patient/organ-specific models for surgical planning
N. Mansour

09.00 - 9.15

Current applications of 3d printing in R&D and educational purposes
P. Oliva

09.30 – 10.00

Guided tour to Humanitas University Campus and Facilities

10.00 – 10.30

Coffee break

10.30 – 11.00

Imaging-Augmented reality-Virtual reality-3d printing
J. Santina

11.00 – 11.30

Avatars and digital twins
T. Marques

11.30 - 12.00

Visit to 3D Innovation lab (basic exercise on printers and machineries)
P. Oliva

12.00 -12.30

Visit to the Simulation Centre: the virtual patient setting
F. Pollio

12.30

Final remarks, future projects
all course Chairs