

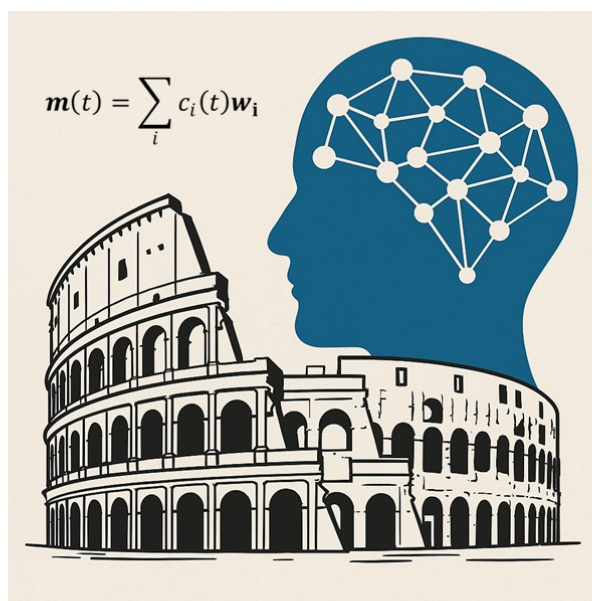


XXVIII School of Physiology and Biophysics

COMPUTATIONAL APPROACHES IN SYSTEMS NEUROPHYSIOLOGY



June 23-25, 2025



University of Rome Tor Vergata, Via Lucullo 11 (piano IV, int.10), Rome

PROGRAM

Monday, June 23, 2025

14:00-14:45 Opening lecture

Why we need computational approaches in systems neurophysiology – Francesco Lacquaniti

14:45-15:15 Lecture 1

Neurophysiological foundations of computational methods for investigating human locomotion – Yury Ivanenko

15:15-16:45 Tutorial 1

Surface electromyography to study human gait: from single muscles to spinal maps – Yury Ivanenko, Francesca Sylos-Labini, Germana Cappellini

16:45-17:15 Coffee break

17:15-17:45 Lecture 2

Muscular and kinematic synergies for motor control – Andrea d'Avella

17:45-19:15 Tutorial 2

Computational methods for the identification of muscular and kinematic synergies – Andrea d'Avella, Lucas Dal'Bello, Elodie Hinneken

19:30-20:30 Welcome cocktail

Tuesday, June 24, 2025

9:00-9:45 Keynote lecture 1

Recurrent neural networks as digital twins of brain activity – Maurizio Mattia

9:45-10:15 Lecture 3

The vestibular system as a computational machine – Myrka Zago

10:15-10:45 Coffee break

10:45-12:15 Tutorial 3

Hand on coordinate transformations and neural network – Myrka Zago, Barbara La Scaleia, Luisa Ledonne

12:15-12:45 Lecture 4

Structural and functional MRI of the vestibular system – Iole Indovina

12:45-14:00 Lunch

14:00-14:45 Keynote lecture 2

Modeling visual processing in rodents using deep convolutional neural networks – Davide Zoccolan

14:45-16:15 Tutorial 4

Hands on MRI data analysis – Iole Indovina, Gianluca Paolocci, Donatella Fracassi

16:15-16:45 Coffee break

16:45-17:15 Lecture 5

Eye movements as a model for the study of motor control and attention – Gianfranco Bosco

17:15-18:45 Tutorial 5

Hands on eye tracking analysis – Gianfranco Bosco, Stefano Sacchetti

20:30-22:30 Social dinner

Wednesday, June 25, 2025

09:00-09:30 Lecture 6

Introduction to data science for neuroscience and psychophysics – Alessandro Moscatelli

09:30-11:00 Tutorial 6

The analysis of psychophysical data with R: examples from haptics – Alessandro Moscatelli, Priscilla Balestrucci

11:00-11:30 Coffee break

11:30-13:00 Closing session

Feedback and closing remarks

Organizing Committee

Francesco Lacquaniti – University of Rome Tor Vergata (URTV) and Fondazione Santa Lucia (FSL), Rome, Italy

Andrea d’Avella – URTV and FSL

Gianfranco Bosco – URTV and FSL

Iole Indovina – URTV and FSL

Yury Ivanenko – FSL

Alessandro Moscatelli – URTV and FSL

Myrka Zago – URTV and FSL

Invited Speakers

Maurizio Mattia – Italian National Institute of Health, Rome, Italy

Davide Zoccolan – International School for Advanced Studies (SISSA), Trieste, Italy

Tutors

Priscilla Balestrucci – FSL

Germana Cappellini – URTV and FSL

Lucas Dal’Bello – FSL

Donatella Fracassi – Università degli Studi di Messina, Italy

Elodie Hinnekens – FSL

Barbara La Scaleia – FSL

Luisa Ledonne – URTV

Gianluca Paolocci – Università degli Studi di Messina, Italy

Stefano Sacchetti – URTV

Francesca Sylos-Labini – URTV and FSL