POLITECNICO MILANO 1863

DEPARTMENT OF ELECTRONICS INFORMATION AND BIOENGINEERING

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5:00 p.m.
Room 21.6.1 - Building 21

PhD seminars in Biomedical Engineering

BRIDGING STRUCTURE & FUNCTION IN THE BRAIN: PROGRESS & PUZZLES

Maria Giulia Preti

Senior Scientist and Lecturer at the Neuro-X Institute, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Biosketch

Maria Giulia Preti received her M.S. degree in Biomedical Engineering (2009) and her Ph.D. degree in Bioengineering (2013) from Politecnico di Milano, Italy. She is currently a Senior Scientist and Lecturer at the Neuro-X Institute, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, and is also affiliated with the Department of Radiology and Medical Informatics at the University of Geneva, Switzerland. During her Ph.D., she was awarded a Progetto Rocca Fellowship from MIT-Italy, which supported a visiting research period at the Massachusetts Institute of Technology and Harvard Medical School (Boston, USA). Her current research focuses on investigating the relationship between brain function and structure using advanced magnetic resonance imaging techniques and graph signal processing methods. In particular, she has acquired extensive expertise in functional MRI, functional connectivity, diffusion tensor imaging and tractography, multimodal integration of MRI with

Abstract

Magnetic resonance imaging (MRI) provides rich information about brain function -from functional MRI- and structural connectomics -from diffusion MRI-, yet understanding the complex relationship between the two remains a major challenge in neuroscience.

Recent advances in connectome harmonic decomposition extend classical signal processing concepts to graph domains, offering a novel perspective on this problem.

In this talk, I will first introduce the methodological framework, then present my recent results in both healthy and clinical populations, and conclude with an outlook on open questions and future directions.

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