



Seminar

“Supervised and Self-supervised Deep Learning for Structural and Functional Neuroimaging”

May 22nd and May 23rd, 2024 - h. 9.00
Aula T.05 – Cà Vignal 3

Prof. Sergey M. Plis

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Abstract

Advances in deep learning have had transformative impacts across various scientific fields, and neuroimaging is no exception. With an ever-increasing volume of structural and functional brain imaging data, the application of deep learning techniques offers a powerful means to unlock deeper insights into brain architecture and function. As the field evolves, understanding deep learning approaches is crucial for neuroscientists, radiologists, and data scientists alike, allowing both the advancement of research and the improvement of clinical outcomes.

This tutorial scrutinizes selected approaches for semantic segmentation from structural MRI and mental disorder classification from fMRI. We will delve into distinct model architectures, their variances, training methodologies, and the appropriate application of each. For both semantic segmentation from structural data and functional data classification, we will examine the prerequisites and modes of supervised training, alongside the unique aspects of self-supervised training for static and dynamic scenarios. Additionally, we will exhibit a model for self-supervised learning in coordinated fusion. The session will culminate with the display of interpretability methods for the given tasks.

The tutorial will be followed by a hands-on workshop where we will demonstrate how to train the models in a unified flexible framework that takes the engineering burden off of the hands of a neuroimager.

Local organization and contact:

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