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| Titolo | Methods for advanced brain imaging |
| Docente | Dr. Milos Ajcevic |
| Lingua insegnamento | English |
| Descrizione | Neuroimaging is an increasingly important tool for studying brain structure and function in both research and clinical care. It is a convergence point for multidisciplinary work from many disciplines. (e.g., engineers, computer scientists, neuroscientists, medical researchers, etc.). The course aims to provide an overview of the main brain imaging techniques. In particular, neuroimaging acquisition, processing and analysis methods will be illustrated. The course will introduce the basic principles of state-of-art neuroimaging. Next, it will focus on functional and perfusion neuroimaging and in particular *functional Magnetic Resonance Imaging* (fMRI), *Arterial Spin Labeling* (ASL) and *Computed Tomography Perfusion* (CTP) techniques. Examples of application in research field and clinical practice will be provided. |
| Programma | • Basic principles of main neuroimaging techniques<br>• Introduction to functional and perfusion neuroimaging<br>• Functional MRI (fMRI): BOLD signal analysis, experimental design, pre-processing of fMRI data, task related fMRI, General Linear Model (GLM), Statistical Parametric Mapping (SPM), resting state connectivity fMRI, Independent Component Analysis (ICA)<br>• Non-invasive MRI based perfusion neuroimaging Arterial Spin Labeling: acquisition, pre-processing, quantification of perfusion<br>• CT based perfusion neuroimaging<br>• Examples of application in research field and clinical practice |
| Durata | 8 hours |
| Periodo | April 2023 |
| Metodi didattici | Lectures |