Title (tentative): Semi-quantification of brain PET images in pediatric oncology

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Motivation and application domain

Quantification of active region of astrocytomas using PET-MRI imaging. IAs are complex diagnostic and therapeutic challenges in children. Given the extreme variability in the clinical course and outcome of IAs, novel imaging modalities are currently under evaluation for a better diagnostic and prognostic stratification; these includes both advanced MRI techniques (i.e. diffusion-weighted imaging, perfusion imaging, and MR spectroscopy) and amino-acid analog PET tracers.

General objectives and main activities

Infiltrative astrocytomas (IAs) represent a group of astrocytic gliomas ranging from low-grade to highly malignant, characterized by diffuse invasion of the brain parenchyma. The goal of this study is PET/MRI images co-registration in order to: select the most appropriate biopsy site; discriminate between disease progression and treatment-related changes. The amount of information gathered by this combined imaging approach can be readily transferred to the everyday practice and may help clinicians to better stratify patients with IAs, for diagnostic, therapeutic and prognostic purposes.

Training Objectives (technical/analytical tools, experimental methodologies)

The student must train with LONI pipeline and ITK tools with the purpose to co-registerate and fuse multimodality images. The clinical data will be provided by Gaslini Hospital.

Place(s) where the thesis work will be carried out: DIFI - Via Dodecaneso 33

Additional information

Maximum number of students: 1