



Scheda di Offerta Tesi

Titolo (provvisorio): 3D segmentation of neonatal/pediatric MRI images

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Descrizione

Motivazione e campo di applicazione

Malformations of cortical development (MCDs) are increasingly recognized as an important cause of epilepsy and developmental delay in children. New strategies have recently been proposed to in-vivo study the human brain pathways, from a structural and functional point of view. The correlation between MCD and alterations of brain connectivity in pediatric patients constitutes an unexplored field of research.

Obiettivi generali e principali attività

New strategies have recently been proposed to in-vivo study the human brain pathways, from a structural and functional point of view. The structural connectome is a comprehensive structural description of the network of cortical elements and physical connections forming the brain, which uses graph theory to abstractly define the brain as a set of anatomical regions, the so-called nodes, and structural connections, the so-called interconnecting edges. Connectome analysis requires a precise segmentation of the brain structures and tissues, in order to correctly and automatically label the nodes topologically and functionally.

Obiettivi di apprendimento (strumenti tecnici e analitici, metodologie sperimentali)

The incomplete white matter myelination in neonates and children below 2 years of age and the cortical and gyral distortions due to MCD make the segmentation techniques commonly employed for adults (i.e. atlas-based) unreliable. Hence, the second objective is to develop a fully automated strategy for the accurate segmentation of the gray and white matter in children with MCD below 2 years of age.

Luogo/i in cui si svolgerà il lavoro: DIBRIS

Informazioni aggiuntive

Numero massimo di studenti: 1