

## **Functional networks. Functional MRI Imaging and Modeling**

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Magnetic resonance imaging (MRI) has developed into a powerful tool in cognitive neuroimaging. It make it possible to investigate the brain in action. We are interested to determine the underlying network involved in sensorimotor or cognitive task ; and to understand how population of neurons and connections between them covering a large network cooperate to represente and excecute a task. Several approaches have been proposed to study the functional connectivity , but these only allow an indirect measure of connectivity. We have recently proposed a novel Bayesian method to study connectivity more directly. This original approach combines both data-driven and a priori knowledge of the predicted networks of interest. This method uses graphical models in order to explore statistically the interactions between co-activated regions. This technique calculates the most probable graph and expresses the statistical relationships between vertices (i.e. activated regions). We apply this approach 1) to identify the functional connectivity corresponding to the consolidation process of motor adaptation tasks in healty subject 2) to study connectivity changes before and after surgical resection of low-grade gliomas in eloquent areas in patient.