A computational view of the brain plasticity at rest

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A computational view of the brain at rest

by Azzurra Invernizzi

1. "The brain needs models."
   Vivien Marx. *Nature Methods*,Vol.15, pp:863–866 (2018).

2. A Bayesian inference statistical approach combined with fMRI recordings accurately reveals the visuotopic organization and can thus be used to investigate the cortico-cortical interactions between visual areas *(Chapter 2 and 4 in this thesis).*

3. The advantages provided by the Bayesian connective field model compared to the standard are in the novel details on lower- and higher-level cortical features of the organization of the visual cortex. The Bayesian connective field model acts as a bridge between levels of understanding of the visual cortical interactions *(Chapter 2 and 3 in this thesis).*

4. Resting-state fMRI-based neural models capture the spatial and temporal organization of the visual cortex in health and disease (such as primary open angle glaucoma), even at the relatively low resolution and signal-to-noise ratio provided by 3T *(Chapter 3 and 4 in this thesis)*.

5. Only at group level, a limited degree of reorganization in the primary visual cortex can be observed in adults affected by glaucoma, irrespective of disease stage *(Chapter 4 in this thesis)*.

6. Resting-state fMRI data together with functional-connectivity based methods can serve as a tool both to guide and monitor clinical interventions, and to study the underlying brain mechanisms at the individual and group levels *(Chapter 5 and 6 in this thesis).*

7. "The complementarity of structure-function relations in the brain, the parallel existence of multiple spatial and temporal scales, and the sheer size of connectome data sets make computational approaches to modeling and data analysis essential and indispensable."
   Olaf Sporn. *Discovering the Human Connectome* (2012).