Modeling the human brain: the need for computational mathematics.

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Starting from the observation that Neuroscience has little explanation and predicting power unlike, e.g., Physics I make a few statements about why this is the case, mostly based upon the hypothesis that the brain seems to be a very complex stochastic dynamic system that performs some kind of computation with coded information at a large number of spatiotemporal scales.

I then propose a solution to improve the situation based upon the classical idea of multidisciplinarity and give examples of the kinds of problems that could be solved by such an approach with a bias on the computational mathematical tools that would be useful. The multidisciplinarity could be instantiated within one or several, yet to be created, European Cortex Computational Modeling Centers (ECCMC) that could play within the neuroscience community the role played by CERN in Physics.

If time permits I will show a few examples of how computational mathematics can be used to solve some problems in modeling brain anatomy and function.