Special Issue

Mathematical Modeling of Neurons and Brain Networks: Fundamental Principles and Special Applications

Message from the Guest Editor

Understanding brain dynamics and function is one of the most relevant topics nowadays. Coupling between brain subsystems and the impact of different cell types and synapses was reported by many groups all over the world and these phenomena need to be summarized as mathematical models since adequate mathematical modeling has been always considered as a significant step in understanding phenomena of nature. Though many models have been already constructed, they are still far from covering most observed phenomena. This Special Issue is devoted to answering the following specific questions:

- Models of neurons and synapses, including new models, comparison of existing ones, computational issues, fitting models to data, etc.
- Models of brain subsystems, i.e. limbic system, thalamocortical system, etc.
- Models of sleep and wakefulness and the transitions between them.
- Memory models.
- Models of disorders and disease, including epilepsy, Parkinsonism, thalamocortical dysrhythmia, Alzheimer's disease, etc.
- Approaches to model (re)construction from experimental data.

Submissions on any other topics related to the general subject of this Special Issue are also welcome.

Guest Editor

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About the Journal

Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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