Special Issue

New Advances in Biocomplexity

Message from the Guest Editor

Biocomplexity is the multidisciplinary study of macroscale complex structures and collective behaviours that arise from microscale interactions of relatively simple biological agents, across multiple levels ranging from molecules and cells to organisms and ecosystems. The key concepts and features include emergence, self-organisation, feedbacks, nonlinearity, sensitivity to initial conditions, critical dynamics, resilience, as well as adaptation and evolution. Information theory, probability theory, and complex network theory provide rigorous frameworks to study these concepts quantitatively. The aim of this Special Issue, aligned with a topical workshop, is to highlight advances in biocomplexity achieved both in terms of the state-of-the-art and state-of-the-practice. Several areas are of special interest: Computational epidemiology and disease control, microbial ecology and biosecurity, functional genomics and bioinformatics, systems biology and artificial life, swarm intelligence and active matter, computational neuroscience and neuro-engineering, cognitive modelling and machine learning.

Guest Editor

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The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

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Editor-in-Chief

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