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— **Call for Papers** —
Annals of Operations Research
Special Volume
Operations Research for Neuroscience III

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After the positive and encouraging response by the scientific and wider community to the previous two special volumes, **Operations Research for Neuroscience** and **Operations Research for Neuroscience II,** the journal *Annals of Operations Research* now invites submissions of papers to a third special volume on the same subject, called **Operations Research for Neuroscience III**.

Neuroscience is a multidisciplinary science that is concerned with the study of the structure and functions of the nervous system. It comprises aspects of physiology, cellular and molecular biology, as well as behavioral and cognitive science. Recent technological and theoretical advances offer promising opportunities for better understanding of the nervous system at the quantitative level. New optogenetic, in vitro and in vivo multielectrode recording, neuroimaging, brain imaging, and other modern techniques provide high-quality data that can be used in elucidating the fundamental mechanisms of information processing in the nervous system.

The rapidly growing pool of experimental data has triggered the development of new mathematical models that can provide new insights into the functioning of the nervous system at various scales, ranging from that of molecular biology to that of the organizational principles of behavior and cognition. Sophisticated analyses of intracellular signaling or dynamics in heterogeneous neural networks, conditional behavior or connections of brain regions in decision-making lead to theoretical problems, addressed by Operations Research.

Although, Operations Research is actively used in a bottom-up approach: from experimental observation to consistent theory; it also widely overlaps with modern and rapidly developing formal theories, e.g., the Free-Energy principle, the Integrated Information theory and many others.

This special volume will cover a broad range of topics in the field of neuroscience that use Operations Research approaches, methods and theories. Potential topics include, but are not limited to, the following areas and methodologies of *neuroscience*:

o Intracellular signaling and regulation
o Synaptic plasticity
o Dynamics in heterogeneous neural networks
o Intelligent systems and control, hybrid systems and regime switching models
o Neuronal and neural generalized Turing machine models
o Perceptual, cognitive and behavioral functions
o Learning and memory
o Spatio-temporal network analysis
o Behavioral economics and finance
o Linguistics and cognition
o Combinatorial optimization
o Signal and information processing
o Neuroimaging and functional brain imaging processing

o Computational modeling and simulation
o Formal theoretical approaches: the Free-Energy principle, the integrated information, Bayesian inference
o Foundations of analytics and artificial intelligence, etc.

The use of methods from modern *Operations Research* in *Neuroscience* is a prerequisite for any paper submitted to this special volume to enter the reviewing process.

Instructions for Authors can be found at:
https://www.springer.com/journal/10479/submission-guidelines

Authors should submit a cover letter and a manuscript by **December 1, 2020**, via the Journal's online submission site. Manuscripts submitted after the deadline may not be considered for the special issue and may be transferred, if accepted, to a regular issue.

Please see the Author instructions on the web site if you have not yet submitted a paper through Springer's web-based system, Editorial Manager. When prompted, please select the special issue's title, **Operations Research for Neuroscience III**, to ensure that it will be reviewed for this Special Issue.

Papers will be subject to a strict review process under the supervision of the Guest Editors, and accepted papers will be published online individually, before print publication.

In case of any questions please contact by e-mail one of the following Guest Editors:

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