PDEs and Deep Learning

Guest Editors:

Prof. Dr. Nir Sochen
Department of Applied Mathematics, School of Mathematical Sciences, University of Tel Aviv, Tel Aviv 39040, Israel

Dr. Leah Bar
Department of Mathematical Sciences, Tel Aviv University, Tel Aviv 39040, Israel

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Message from the Guest Editors

In this Special Issue, we invite two types of research papers. One type is the use of PDEs to enhance understanding of NN and DL. In particular, we are interested in viewing NN as a discrete approximation of a PDE in a high dimension, but any other mathematical modeling of DL and NN that improves our understanding and control over these technologies is most welcome. The second type of research we are seeking is numerical solution methods of PDEs and inverse problems (IP) via the use of NN and DL. In particular, we are interested in the ways that this new emerging method which solves PDEs and IP can be analyzed to bound the approximation error as a function of the NN architecture. Inverse problems are the most important types of problems of applied value, and it is ubiquitous in medical imaging and environmental studies among other domains of interest with a huge impact on our daily life.

Special Issue

Editor-in-Chief

Prof. Dr. Francisco Chiclana
School of Computer Science and
Informatics, De Montfort
University, The Gateway,
Leicester LE1 9BH, UK

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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