

# **International Joint Conference on Neural Networks 2023**

## **Call for Papers for Special Session on**

### **Randomization-Based Deep and Shallow Learning Algorithms**

Randomization-based learning algorithms have received considerable attention from academics, researchers, and domain workers because randomization-based neural networks can be trained by non-iterative approaches possessing closed-form solutions. Those methods are generally computationally faster than iterative solutions and less sensitive to parameter settings. Even though randomization-based non-iterative methods have attracted much attention in recent years, their deep structures have not been sufficiently developed nor benchmarked. This special session aims to bridge this gap.

The first target of this special session is to present the recent advances in randomization-based learning methods. Randomization-based neural networks usually offer non-iterative closed-form solutions. Secondly, the focus is on promoting the concepts of non-iterative optimization with respect to counterparts, such as gradient-based methods and derivative-free iterative optimization techniques. Besides the dissemination of the latest research results on randomization-based and/or non-iterative algorithms, it is also expected that this special session will cover some practical applications, present some new ideas and identify directions for future studies.

Original contributions as well as comparative studies among randomization-based and non-randomized-based methods are welcome with unbiased literature review and comparative studies. Original contributions having biomedical applications with or without randomization algorithms are also welcome. Typical deep/shallow paradigms include (but not limited to) random vector functional link (RVFL / ensemble deep RVFL), randomized recurrent networks (RRN), kernel ridge regression (KRR) with randomization, extreme learning machines (ELM), random forests (RF), stochastic configuration network (SCN), broad learning system (BLS), convolution neural networks (CNN) with randomization, and so on.

#### **Topics:**

The topics of the special session include (with randomization-based methods), but are not limited to:

- Randomized convolutional neural networks
- Randomized internal representation learning
- Regression, classification, and time series analysis by randomization-based methods
- Kernel methods such as kernel ridge regression, kernel adaptive filters, etc. with randomization
- Feedforward, recurrent, multilayer, deep and other structures with randomization
- Ensemble deep learning with randomization such as the edRVFL
- Moore-Penrose pseudo inverse, SVD and other solution procedures.
- Gaussian process regression
- Randomization-based methods using novel fuzzy approaches
- Randomization-based methods for large-scale problems with and without kernels

- Theoretical analysis of randomization-based methods
- Comparative studies with competing methods without randomization
- Deep randomized convolutional neural networks
- Random/Rotation forests, oblique random forest, and XGBoost based methods
- Applications of randomized methods in areas such as biomedicine, finance, economics, signal processing, big data and all other relevant areas

## **Organizers**

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## **Important Dates**

- Jan 31, 2023– First Paper submission deadline (Extension may be offered)
- March 31, 2023 – Paper acceptance notification
- June 18-23, 2023– Gold Coast Convention Centre, Queensland, Australia

## **Paper Submission**

Papers submitted to this Special Session are reviewed according to the same rules as the submissions to the regular sessions of IJCNN 2023. Authors who submit papers to this session are invited to mention it in the form during the submission. Submissions to regular and special sessions follow identical format, instructions, deadlines, and review procedures. Please, for further information and news refer to the IJCNN website: <https://2023.ijcnn.org/>

To submit to this special session, please use this link:

<https://edas.info/newPaper.php?c=30081&track=116093>