IEEE World Congress on Computational Intelligence (WCCI 2020)

WCCI 2020 - Call for Papers for Special Session on

Randomization-Based Deep and Shallow Learning Algorithms

Selected papers will be invited to Applied Soft Computing Journal Special Issue.

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 in general 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 of 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 methods and non-randomized methods are welcome with unbiased literature review and comparative studies. Typical deep/shallow paradigms include (but not limited to) random vector functional link (RVFL), echo state networks (ESN), liquid state networks (LSN), kernel ridge regression (KRR) with randomization, extreme learning machines (ELM), random forests (RF), and so on.

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 learning with randomization
- Moore-Penrose pseudo inverse, SVD and other solution procedures
- Gaussian process regression
- Randomization-based methods for large-scale problems with and without kernels
- Theoretical analysis of randomization-based methods

- Comparative studies with competing methods with or without randomization
- Applications of randomized methods in domains such as power systems, biomedical, finance, signal processing, big data and all other relevant areas

<u>Organizers</u>

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<u>Important Dates</u> (Deadline extensions from WCCI 2020 website)

- 15th January 2020 – Paper submission deadline
- 15th March 2020 – Paper acceptance notification
- 19th – 24th July 2020 – IEEE WCCI 2020, Glasgow, Scotland, UK

<u>Paper Submission</u>

Papers submitted to this Special Session are reviewed according to the same rules as the submissions to the regular sessions of WCCI 2020. Authors who submit papers to this session are invited to select **"S01. Randomization-Based Deep and Shallow Learning Algorithms" as their main topic**. Submissions to special sessions follow identical format, instructions, deadlines and procedures of regular papers.

Paper submission link: **https://ieee-cis.org/conferences/ijcnn2020/upload.php**

For further information and news, please refer to the WCCI 2020 website:
https://www.wcci2020.org/