

Advances and Practical Applications of Deep and Shallow Machine Learning

J.UCS Special Issue

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In this Special Issue of the prestigious Journal of Universal Computer Science (J.UCS), we present the collection of high-quality papers concerning theoretical advances and practical applications of deep and shallow learning in different fields.

The authors of selected contributions presented on the 12th International Conference on Computer Recognition Systems (CORES) and the 12th International Conference on Image Processing and Communications (IP&C), held jointly with the 22nd International Conference on Advanced Computer Systems (ACS), were invited to submit extended versions of their original papers for this Special Issue. Our multi-conference took place in June 2021. Beyond, this Special Issue was open to other submissions outside of the conference, too.

The selected papers reflect the advancements in solving the current challenges of the Artificial Intelligence (AI) systems, in particular machine learning. The collected articles vividly demonstrate how theoretical breakthroughs translate into tackling practical problems, in real-life context.

The section of theoretical papers starts with the work of Mariusz Topolski and Marcin Beza, who improve the Principal Component Analysis Method based on feature rotation by class centroids.

Then, Jędrzej Kozal, Filip Guzy and Michał Woźniak explain how to overcome concept drift in data by employing chunk size adaptation.

Lastly, Paweł Trajdos and Robert Burduk explore probability-driven scoring functions in combining linear classifiers.

The section on practical applications balances the theoretical one in the number of papers.

In the first one, Dagmara Łapczyńska, Konrad Łapczyński, Anna Burduk and Jose Machado optimize scheduling of tasks in a production process by applying heuristic algorithms.

Then, Lerina Aversano, Mario Luca Bernardi and Marta Cimtile investigate water stress classification by use of convolutional deep neural networks.

Finally, Emily Jenifer and Sudha Natarajan present DeepFlood, a deep learning-based framework for flood detection that uses feature-level fusion of multi-sensor remote sensing images.

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