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Extensions of dynamic programming for machine learning and knowledge representation

We discuss so called multi-pruning which allows us to construct classifiers (decision trees) that outperform often classifiers constructed by CART. This approach is based on the construction of the set of Pareto optimal points for bi-criteria optimization problem relative to the size of decision trees and the number of misclassifications. The second topic is connected with multi-stage optimization of decision rules relative to the coverage and length. Based on this optimization procedure, we can simulate the work of greedy algorithm for the set cover problem. As a result, for many datasets from UCI ML Repository, we can construct small systems of enough accurate decision rules that cover the most part of objects (rows). The end of the presentation is devoted to the introduction to KAUST.

Biography

Mikhail Moshkov is a Professor in the CEMSE Division at King Abdullah University of Science and Technology, Saudi Arabia since October 1, 2008. He earned his Master's degree from Nizhni Novgorod State University, received his Doctorate from Saratov State University, and Habilitation from Moscow State University. From 1977 to 2004, he was with Nizhni Novgorod State University. Since 2003, he worked in Poland in the Institute of Computer Science, University of Silesia, and since 2006 also in the Katowice Institute of Information Technologies. His main areas of research are complexity of algorithms, combinatorial optimization, and machine learning. He is author or co-author of five research monographs published by Springer.

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