

Antennas and Propagation section (API)
INVITED PAPER:

“Machine learning in applied electromagnetics”

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Abstract: We outline the ongoing research efforts in machine learning applied to electromagnetics at the School of Electrical Engineering, University of Belgrade, Serbia. Namely, in the past two years, our group has published multiple results regarding machine learning for antenna design and optimization, as well as applications for analyzing the emanated electromagnetic field from flat-panel monitors. We focus on finding the optimal topology of multilayer perceptron (neural) networks for the considered electromagnetic systems and assess the accuracy and efficiency of such models. The first reported example includes a dataset of up to 10 million Yagi-Uda antennas with four design parameters. The second example contains measurements of the emanated field from multiple flat-panel monitors over (up to) 48 hours. In both examples, we use ensembles of multilayer perceptron networks to overcome the modeling errors due to the stochastic nature of network training.

Short biography:



Dragan I. Olćan (S'05-M'09) is a Full Professor at the School of Electrical Engineering, University of Belgrade, Serbia. At the same school, he received B.Sc., M.Sc., and Ph.D. degrees in 2001, 2004, and 2008, respectively. He is a co-author of three commercial electromagnetic software codes, 28 journal papers, 120 conference papers, and 7 textbooks. His main research interests are optimization algorithms and machine learning applied to electromagnetic design, numerical electromagnetic analysis, and electromagnetic compatibility.