Petrasova, Iveta; **Karban, Pavel**; **Kropik, Petr**; **Panek, David**; **Dolezel, Ivo**
Optimization of selected operation characteristics of array antennas. (English) Zbl 1476.78008
J. Comput. Appl. Math. 399, Article ID 113726, 12 p. (2022).

Summary: Method of optimizing the distance between individual elements in the antenna array is presented. Based on the verification of the analytical model for one defined rectangular patch antenna and subsequently for the antenna array, the sweep analysis was performed for variant voltage and phase values on each element of the array. The results were used as the input parameters for creating a surrogate model using a neural network for implementation in a micro-controller and use for voltage control in the array. The methodology is illustrated with a typical example.

MSC:

78A50 Antennas, waveguides in optics and electromagnetic theory
78A40 Waves and radiation in optics and electromagnetic theory
94A12 Signal theory (characterization, reconstruction, filtering, etc.)
78M50 Optimization problems in optics and electromagnetic theory
35R02 PDEs on graphs and networks (ramified or polygonal spaces)

Keywords:

rectangular patch antenna; antenna array; optimization; neural networks; surrogate model; micro-controller

Software:

GitHub; Keras; TensorFlow; ALO

Full Text: DOI

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