Journal of Computer Science and Information Systems,

ISSN 2535-1451

Optimization of Antenna Design Using Neural Networks in IoT-Based Communication Systems

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Abstract:

The growing demand for efficient and compact antennas in Internet of Things (IoT) applications necessitates advanced optimization techniques to meet performance requirements in complex communication environments. This study explores the application of neural networks for the optimization of antenna design parameters within IoT-based communication systems. By leveraging deep learning models, particularly feedforward and convolutional neural networks, the research aims to predict and optimize antenna characteristics such as gain, bandwidth, and radiation pattern based on a set of design inputs. The proposed methodology is validated through simulation data and experimental results, demonstrating improved convergence speed and design accuracy over traditional heuristic methods. This neural network-based approach offers a scalable and data-driven solution for designing high-performance antennas tailored to the evolving demands of IoT communication infrastructures.

Keywords:

Antenna design, neural networks, IoT communication systems, optimization, deep learning, smart devices.

ISSN 2535-1451

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