

Neural Network-Based Optimization in Antenna Design for IoT Network Applications and Beyond

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Abstract:

The integration of neural network-based optimization techniques into antenna design has significantly advanced the development of efficient and adaptable antennas for Internet of Things (IoT) applications and beyond. Deep learning models, particularly convolutional neural networks (CNNs), have been employed to predict and optimize antenna performance metrics such as gain, efficiency, and radiation patterns, enabling the design of antennas that meet specific application requirements. Optimization-oriented methods using deep neural learning have demonstrated the potential to streamline the antenna design process in automated environments. Additionally, machine learning frameworks have been used to swiftly optimize antennas by leveraging surrogate models and intelligent criteria, reducing computational costs while maintaining design accuracy. These advancements underscore the transformative impact of neural network-based optimization in antenna design, facilitating the development of antennas that are not only efficient but also adaptable to the dynamic requirements of modern wireless communication systems.

Keywords: Neural Networks, Antenna Design, Optimization, IoT Applications, Deep Learning, Wireless Communication

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