Wavelet neural networks in signal parameter estimation: A comprehensive review for next-generation wireless systems Available to Purchase

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This review paper examines the integration of wavelet theory with neural network (NN) architectures, with a specific focus on the application of wavelet NNs (WNN) in signal parameter prediction and path loss modeling. As 5G technology advances and the demand for robust wireless communication systems increases, accurate prediction of signal parameters becomes increasingly critical. We begin with an overview of artificial NNs, elucidating their significance in complex pattern recognition tasks. We then delve into wavelet NNs, discussing the synergy between wavelet transforms and NN structures, and how this fusion enhances the network's ability to process non-stationary signals in wireless communication.

The paper reviews recent results showing wavelet-based techniques work in various signal settings. WNNs struggle to adapt to diverse circumstances that affect real-world signal transmission, despite their advantages. Our analysis of these issues and recent literature's answers is detailed.