Chapter 6
Bandwidth Analysis of Dual-Feed Slotted Antenna Using Artificial Neural Networks

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ABSTRACT

In this chapter, artificial neural network is used for the estimation of bandwidth of a dual feed microstrip antenna. The MLPFFBP-ANN and RBF-ANN are used to implement the neural network model. The simulated values for training and testing the neural network are obtained by simulating the antenna on IE3D software. The results obtained by using ANNs and IE3D simulation are compared and are found quite acceptable, and also it is concluded that RBF network is more accurate and fast as compared to back propagation algorithm of MLPFFBP. The anticipated is applicable to operate in triple band from 2.208GHz-5.35GHz, 2.358GHz-2.736GHz, and 3.815GHz-5.143GHz. The antenna is also fabricated with FR-4 glass epoxy material. The experimental results, simulated results of IE3D, and simulated results of neural network are compared.

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1. INTRODUCTION

Neuro models are computationally substantially more effective then EM models once they are prepared with dependable taking in information get from a fine model by either EM reproduction or estimation. The Neuro models can be utilized for proficient precise advancement and planned inside the scope of preparing (Gao et al., 2017; Hassoun, 1999; Haykin, 2003; Kumar & Ray, 2003; Zeland Software Inc, n.d.). The Method of Moments (MOM) based IE3D programming has been utilized to create preparing and test information for the ANN. It is a computational EM test system dependent on Method of Moments numerical techniques. It is investigation that a 3D and multi layer structure of general shapes feed point must be situated at point on the fix where the information impedance of fix coordinated the feed for the particular full recurrence. The arrival misfortune is recorded and that feed point is chosen as the ideal one where the RL is most negative for example not exactly - 10db. It is anything but difficult to demonstrate and simple to coordinate by controlling the test feed arranges (Jain et al., 2019; Rashmi et al., 2018; Singh Nikhil, Singh Vinod, Saxena et al, 2018; Thakre & Singhal, 2009; Wu et al., 2015).

Microstrip reception apparatus' are utilized in remote correspondence because of its light loads low profile, ease, mandate with high transmission productivity and simplicity of incorporation with microwave circuit and convenient correspondence equipments, that is the reason it discovers place in much applications since 1970's. Anyway slotted cross antenna as the disadvantage of restricted transfer speed, limited power, weak polarization, however analysts have been proposed and researched numerous procedures to overcome the downsides, by using thick substrates, adjusted ground plane and utilization of many feed methods and impedance coordinating strategies and the utilization of various resonators(Jamshed, 2015; Mourad & Essaaidi, 2014; Naresh & Singh, 2020; Poornima, 2018; Rachana et al., 2018; Sharma et al., 2018; Singh Nikhil, Sharma Niraj, Zakir et al, 2018; Xu & Li, 2012).

The proposed antenna give triple bandwidth of 83.10%, 28.12% and 14.84% covering the frequency range of. 2.208GHz - 5.35GHz, 2.358GHz - 2.736GHz and 3.815GHz - 5.143GHz which is best suitable for WLAN (Hyper line & W Line) UWB (low band Europe & Japan) and Wimax,Worldwide Interoperability for micro access IEEE 802.11g and Long range surveillance for Radar application system

2. DESIGNING AND DATA CREATION

Figure 1 describes the geometry of the conventional antenna. A radio wire has 33.4 mm×40.6 mm altered ground plane and 23.8 mm×31 mm of slotted cross

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