

DEPARTMENT OF ELECTRICAL ENGINEERING PHD DISSERTATION DEFENSE

Development and Application of Genetic Programming in the Design and Optimization of Ultra -Wideband 3D Metamaterials

Speaker: Jennifer Rayno
Date: Thursday, February 18, 2016
Time: 9:30am – 11:30am
Location: Holmes Hall 389

Abstract

Metamaterials are materials with engineered characteristics and unique properties not naturally available, such as artificial magnetic conductors (AMC). Limitation of present AMC designs is related to their narrowband and high frequency operation, in GHz range. For many commercial and military applications, however, it is desired to design such materials in lower MHz band and with ultra-wideband (UWB) performance. In addition, typical 2D AMCs are designed by trial and error, often based on combination of layers of existing designs, and lossy materials are used to achieve broadband performance. There is no methodology that exists for designing true-3D metamaterials with broadband characteristics in the MHz band. This research uses genetic programming (GP) to automatically and efficiently explore the utilization of 3D design space to develop materials with the