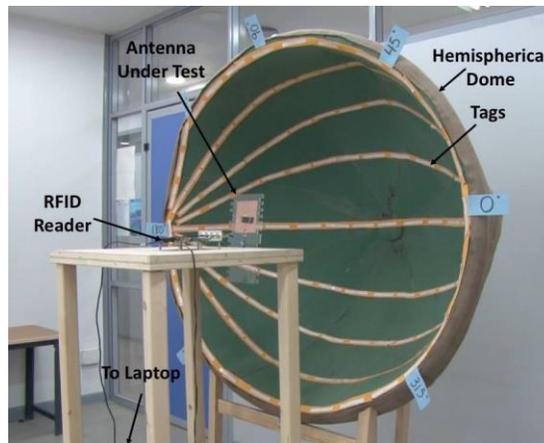


Machine Learning in Antenna Dome Measurement Enhancement

Project Overview:

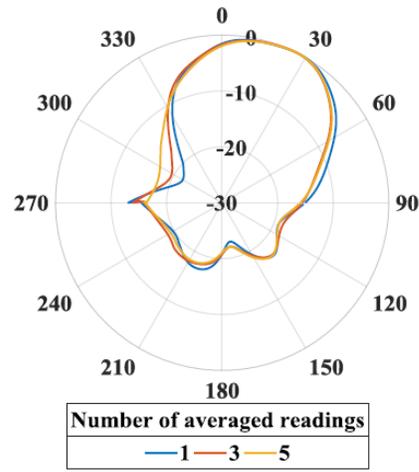
Antenna measurement is crucial for characterizing the performance of an antenna to ensure meeting preset specifications. Commonly, antenna measurements are done in anechoic chambers to ensure minimum reflections. However, anechoic chamber high cost implementation has limited its wide installation in universities. Hence, real life visualizing for antenna theory of design and characterization is rarely considered for undergraduate students. A novel educational measurement setup is proposed to mimic the anechoic antenna measurement system using non-specialized on the shelf components providing simple illustrative material to demonstrate various antenna properties. The system was verified by testing several antennas operating in the UHF band with various designs and characteristics.

In-class dome measurement setup



The reader may occasionally lose communication with some of the distributed tags. This issue has two indications, either the tag has very low power lower than the reader sensitivity at this specific observation point (null) or a destructive interference has occurred which leads to measurement calculation error. The multipath problem was be

solved by an averaging technique for different antenna measurement results while slightly moving the antenna in any of the 4 positions from the center (front, back, left and right).



The aim of the project is to use artificial intelligence to minimize the number of reading attaining the measurements accuracy for the antenna under test.

- By multiple Measurements, the electromagnetic characteristics of various antennas are found out.
- These characteristics are stored in a database and used as a data set for training a certain machine learning algorithm.
- A machine learning technique is selected and an algorithm is developed for predictions to enhance the antenna measurement method and minimize the number of readings needed.

Eligible Departments:

Electronics	
Communications	✓
Networking	

Software/Hardware:

CST simulations.

MATLAB.

Fabrication for fair measurements comparison.