

1.1 REQUIREMENTS & CONSTRAINTS

List all requirements for your project. Separate your requirements by type, which may include functional requirements (specification), resource requirements, physical requirements, aesthetic requirements, user experiential requirements, economic/market requirements, environmental requirements, UI requirements, and any others relevant to your project. When a requirement is also a quantitative constraint, either separate it into a list of constraints, or annotate at the end of requirement as“(constraint).”Ensure your requirements are realistic, specific, reflective or in support of user needs, and comprehensive.

Mechanical Requirements -

Design of both the antenna rotating device and the antenna receiving device must not exceed the opening on the side of the anechoic chamber. This opening has a constraint of 3.5 in x 3.5 in. We also need the device to be able to house 2 motors (used for rotation), a motor controller, and it needs to have a device to hold a specific waveguide. The waveguide holding device may need to be interchangeable to expand how many waveguides or antennas can be used with the design.

The device also needs to be able to support anechoic cones that will be attached onto the face of the device so it does not supply any unwanted or negligent reflections into the system, these may skew the intended testing.

Software Requirements -

Functional requirements:

The application must be able to receive and parse binary file data to be able to interpret antenna angles, radiation patterns, movement in x and y directions, ect. This software must also plot points and model the pattern on a 2d or 3d plane and interpolate/extrapolate data between angles to correctly model the pattern. This application shall also be able to control the motors to move the antenna on certain paths to collect data.

Non functional requirements:

The application should be able to run for multiple hours to collect adequate amounts of data

The application should plot data to multiple decimal points of accuracy

The application should be able to download a pdf to a host users hard drive within 1 minute

UI requirements:

The application must have a button to download data as a pdf for a given testing cycle.

The application shall also have a display of the model in a 2d or 3d plane.

1.2 ENGINEERING STANDARDS

What Engineering standards are likely to apply to your project? Some standards might be built into your requirements (Use 802.11 ac wifi standard) and many others might fall out of design. For each standard listed, also provide a brief justification.

IEEE Std. 488.1-1987 Standard Digital Interface for Programmable Instrumentation - We will need to use SCPI commands to communicate with various components and subsystems involved in this project, these include the Vector Network Analyzer and Motor controller.

IEEE Std. 488.2-1987 Codes, Formats and Common Commands For Use With IEEE Std. 488.1-1987. -

Similarly to the use of 488.1, we will need to be familiar with this engineering standard to be able to communicate with the various test equipment involved with this project.