Name(s)	**Project Number**
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Project Title

Increasing Bluetooth Range with Different Antennas

Abstract

Objectives/Goals

This project seeks to use different antennas to increase the signal strength in a wireless Bluetooth connection between a speaker and a host device.

Methods/Materials

Jam Speaker and Thinkpad Laptop.

Three antennas primarily made out of copper wire.

Bluez: Free Linux software package for measuring Bluetooth signal strength.

Custom made Python script for quickly tabulating measurements.

Different antennas were connected to the Jam Speaker. From a radius of 50 feet, the custom Python script on the laptop measured and tabulated the received signal strength (RSSI) from the Jam Speaker at various angles. The script saved the data as a standard spreadsheet. Microsoft Office Excel was used to calculate averages and generate graphs.

Results

The antennas in order from lowest to strongest RSSI were as follows:

-Wire/Pole antenna

-No antenna (control group)

-Loop antenna

-Yagi antenna

Conclusions/Discussion

A Yagi antenna yielded the strongest average signal strength. However, the increase in signal was not uniform as the "back" of the antenna had a significantly weaker signal than the "front". The Yagi antenna's large size also reduces its practicality in mobile Bluetooth applications. Ultimately, the project did managed to increase the possible range between Bluetooth devices.

Summary Statement

This project determined that Bluetooth signal strength is greatly increased when using a Yagi antenna.

Help Received

We got some assistance from our chemistry teacher as we designed our charts and graphs. At the time of this application we expect to soon meet with Dr. Gavor at UCR to discuss our experiment.