REU/REV Update

Paul Curtis and Vitor Weber
Project Description

- Android based acoustic ranging application

Current Work

- Paul: 2 device ranging using android devices + calculations in MATLAB
- Vitor: Device to device communication

Future Work

- Expand to multiple devices for triangulation and sensor network algorithms
Getting Familiar With Android

Figure 1. Simple waveform generator app
Ranging Strategy

Figure 2. Illustration of the two-way sensing stage in the BeepBeep ranging procedure.

MATLAB Results

\[ D = \left( \frac{c}{2 \times fs} \right) \times [(nA2 - nA1) - (nB2 - nB1)] + K \]
MATLAB Results Cont.

- July 17\textsuperscript{th}, 2013
  - 24 ranging tests from .6 meters up to 2.75 meters
  - MSE = 2.912 cm
Present and Near Future

• Current Challenges
  ◦ Multipath effects

• Next Steps
  ◦ Move calculations from MATLAB to Android device
  ◦ Integrate with Vitor’s Work
  ◦ Look further into ultrasonic possibilities
Server/Client App

- The app will enable android devices to send and receive ranging data

- After ranging data is acquired by each device, all data will be sent to one device

- The Server/Client app java code used was found in an Android tutorial
Server/Client App

- The Server/Client apps are capable to communicate between two devices.
Server/Client App Current Challenges

- Allow multiple clients to communicate with server

- Server must be able to identify which client is sending data via time stamp and/or device ID
Server/Client App Future Steps

- Determine what data will be passed from ranging app and what calculations will be done at server

- Possibility of each tablet be a server/client instead of one centralized server
Works Cited
