Testing

Team BrightGoal

Project Status

Project Recap:

- Training tool for athletes to help with their footwork
- Demo will be an application of our tool an interactive form

Where we are:

- More part ordered and arrived
- Currently have basic communication working between foot module and computer
- Began testing for Zigbee latency

Test Case #1 - Xbee Throughput

- Requirement Tested
  - Low latency
  - Throughput
- Use case
  - Xbee communication during normal use
- Metric
  - Bits/second
- Test Sequence
  - C program to send packets from one Zigbee to another
- Deployment Issues
  - Reproducibility - Dropped packets

Test Case #2 - IMU Accuracy

- Requirement
  - Accurate Motion Tracking (no more than 1% error)
- Use Case
  - Foot tracking during normal use
- Metric
  - Distance in meters (3 dimensions)
  - Orientation in degrees (3 dimensions)

- Test Sequence
  - zero the foot module
  - move the foot module a defined distance in a defined direction
  - measure the difference between the distance reported and the actual distance
- Deployment Issues
  - Cannot get motion tracking accurate enough for actual play

Test Case #3 - Battery Life

- Requirement
  - Battery life lasts at least 1 hour of continuous use
- Use Case
  - Battery duration during normal use
- Metric
  - Time - duration of how long the battery will last
- Test Sequence
  - Fully charge battery
  - Turn on system
  - Have system continuously active until battery dies
  - Use timer to determine how long the battery lasted

Test Case #4 - Hardware Durability

- Requirement
  - Rugged Hardware
- Use Case
  - Ensuring hardware durability
- Metric
  - If the system still works after our test
- Test Sequence
  - Strap device to shoe
  - Run around violently
  - Check to see if system is still tracking the foot module

Test Case #5 - Total System Latency

- Requirement
  - Low Latency (time from foot movement to haptic feedback)
- Use Case
  - Kicking a ball
- Metric
  - Time (milliseconds)
- Test Sequence
  - Turn on system
  - Attempt to kick a virtual ball using the system
  - Feel for delay between kick and haptic feedback

Test Case #1 - Experiment

- Hypothesis
  - To test the throughput of the Zigbee wireless connection
- Test setup
  - 2 Zigbee Xbee modules, 1 Zigbee explorer dongle, Wireshark
- Metrics
  - Bits read in per second.
- Workload
  -
- Parameters
  - Baud rate
- Test run
  - Keep packet length constant
- Experiment

Xbee Throughput

Throughput vs. Baud Rate
For Long Sequential Write Test