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Project Proposal

Wireless wearable Tracker System

# Topics

Wearable devices are intended to become a popular technology trend of 2015. The wearable devices enable an extensive collection of body sensing applications, from cardiovascular monitoring to tracking steps. Each applications has unique design challenges, but they all share some common issues. The largest issues include form factor, power and data rate. A wearable device needs to maintain a small form factor to avoid human aggravation, otherwise the user won’t use the device. Power is a problem for almost every wireless device. Maintaining enough power to function over a long period of time can be difficult, especially considering size limiting form factor. Furthermore the amount of power will affect the data rate of the system. Less power means less successful and slower wireless communication. Ultimately a strong wearable device will find a solid compromise between form factor, power and data rate.

In our project we will look at the performance of a simple wearable device. The device will include a wireless module (Bluetooth) to communicate to a computer or smartphone. An accelerometer will be included to collect user movement data periodically. A microcontroller will collect and transfer the data over Bluetooth. A rechargeable battery will supply power to the system. Lastly, the device is charged through a USB interface. An example block diagram of the system can be seen in Figure 1.



Figure - System Block Diagram

# Work To Be Performed

To evaluate the performance of our wearable device we will construct a mathematical model using the methods learned in class. The model should show the effect of power consumption, data rate, and error rate on the system. An estimate can be made for the devices mean time to fail based on estimated component failure rates. Additionally, the device primary bottleneck, limiting the throughput of the system, can be examined.

If time permits, we will attempt to compare the mathematic model with physical hardware. Our model should produce similar results, with some variation caused by actual components.

# Expected Results

# Relevant Literature

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