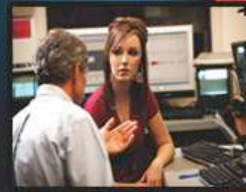


# Wearable Multi-Sensors for Noninvasive Fatigue Monitoring

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**COLLEGE OF ENGINEERING**

**Oregon State**  
UNIVERSITY

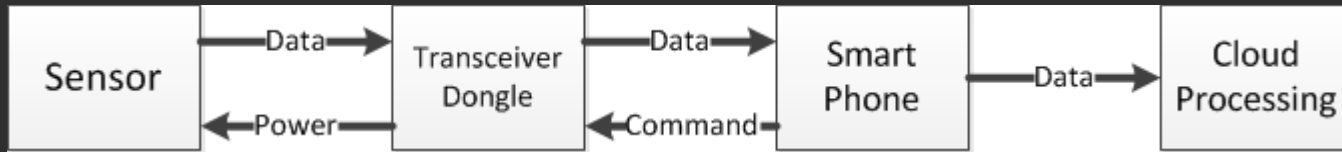
# Problem Statement

- Is there a correlation between fatigue and vitamin C deficiency?
- Conventional monitoring of fatigue is either expensive, coarse-grained, or inaccurate
- Current monitoring technology is unable to extract other important signs of fatigue, such as reduced gait-velocity and elevated heart-rate.

# Solution

- Make our own monitoring sensor system!
- Body Area Network of wearable sensors
  - Placeable any where on the body
  - Operate over a long duration of time
  - Multiple bio-sensors in one package

# Implementation

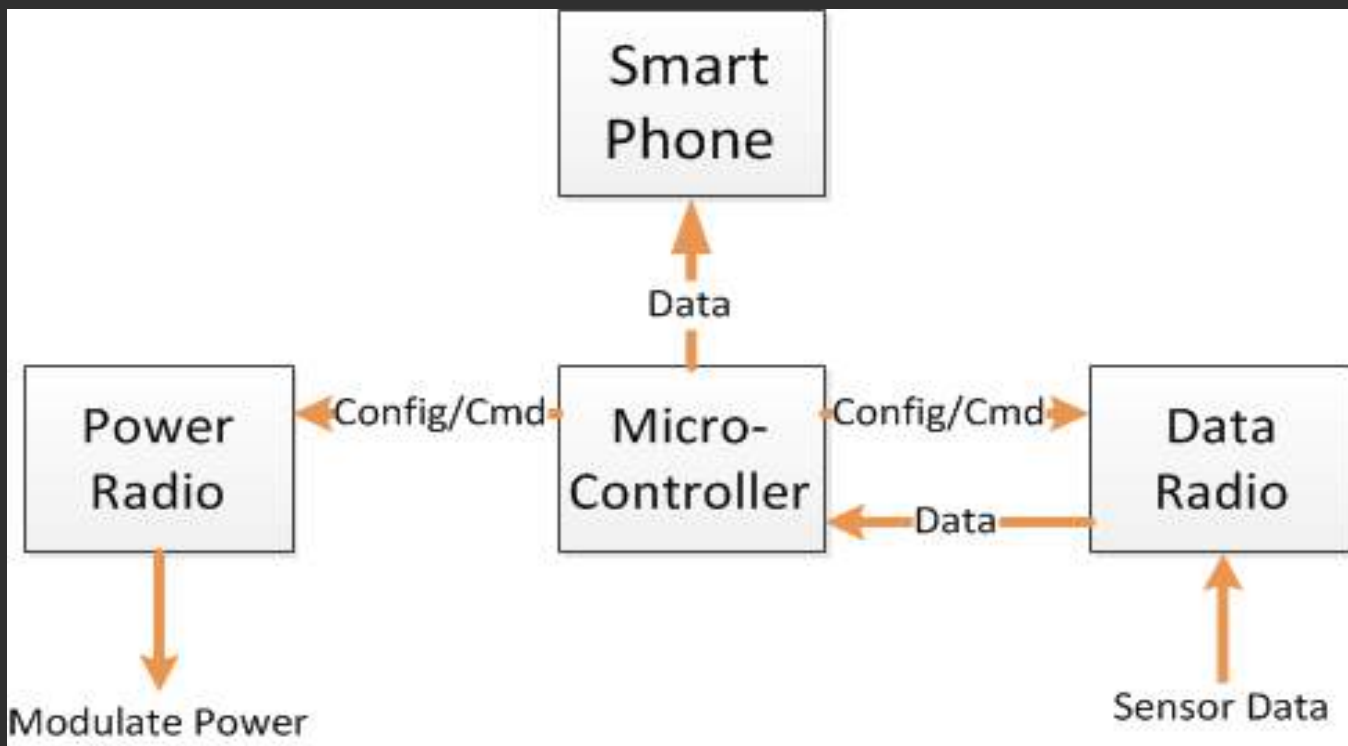


- Sensor
  - Application Specific Integrated Circuit
  - Wireless communication and powered
- Transceiver dongle
  - Send power to sensor
  - Receive data from sensor
  - Relay data to smart phone
  - Accept commands from smart phone

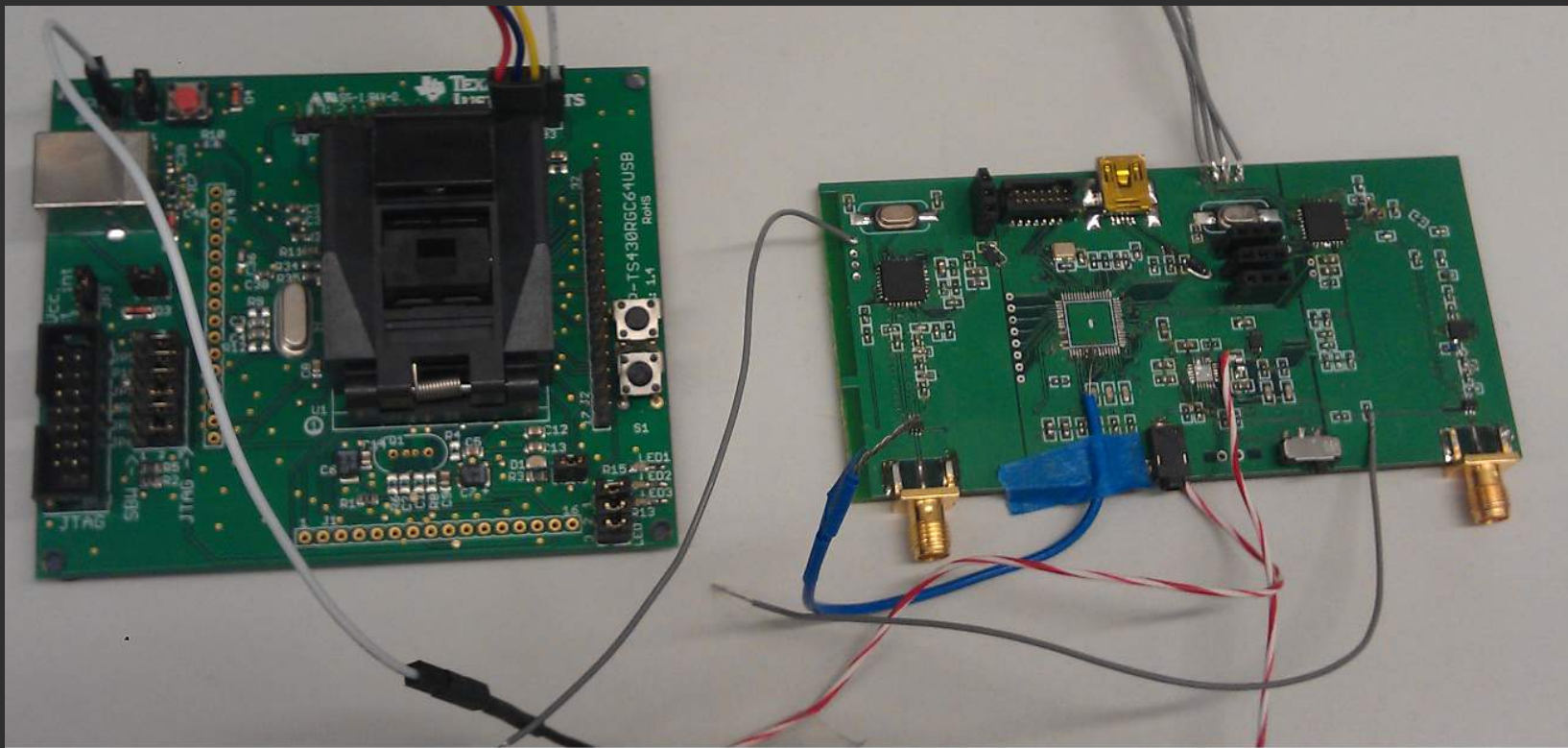
# My Research

- Dongle to phone communication
  - USB Standers
  - Android API
  - Microcontroller USB interface
- Dongle control software
  - Switch between sending power and receiving data
  - Configure the radios
  - Communicate with Smart Phone

# My Research

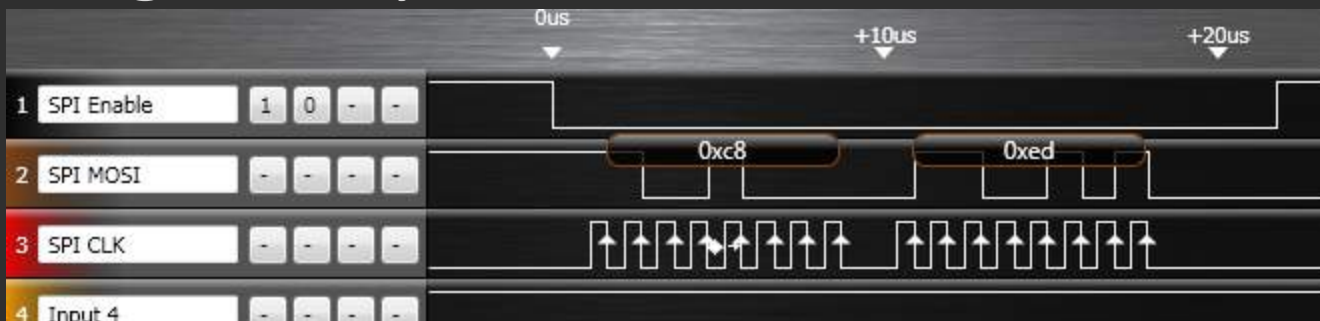


# Phone Dongle

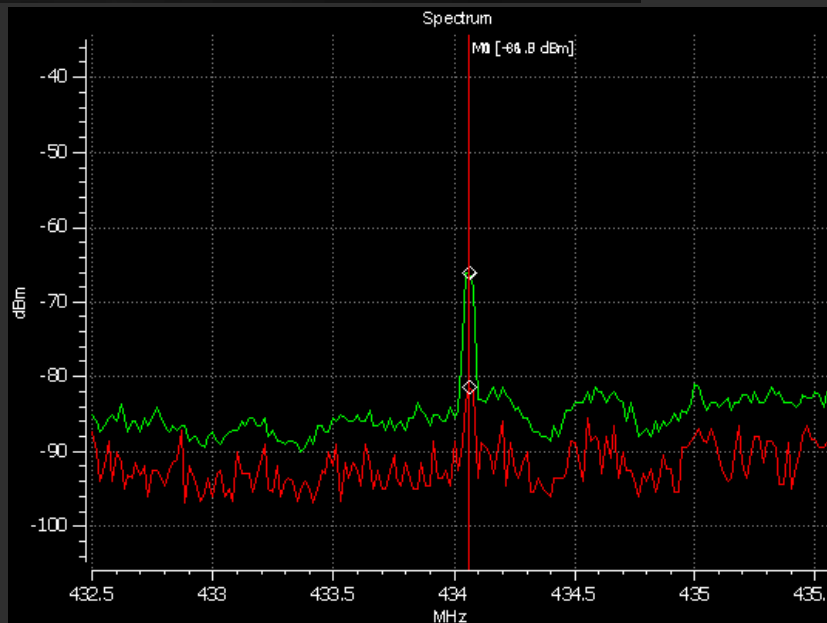


# Tools

- Logic analyzer

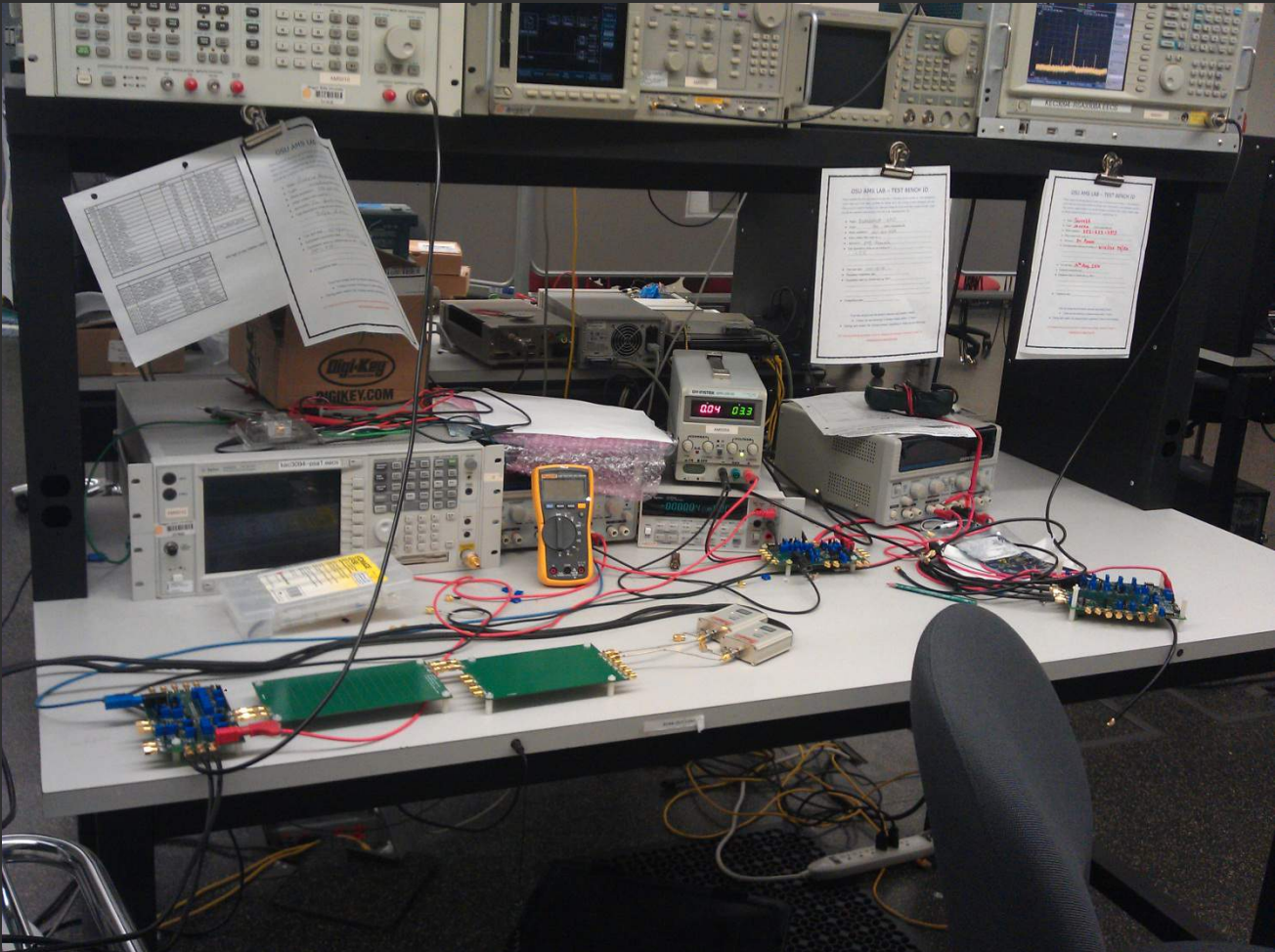


- Spectrum analyzer





# Analog Mixed Signals Lab



# Future Research

- PCB redesign and change parts
- Testing at different frequencies
- Integrating all components
- Field testing of system



# Acknowledgments

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