CS M117 Notes
W 1 T Lec 3-29-16

Revaz Dzhanidze
revazd@cs.ucla.edu
revazd@ee.ucla.edu

O.H.

- Professor

11:00 - 1:50 AM T/R, 3704 BH/3732K BH

Course Objectives

- Provides fundamental knowledge for **wireless** data communication
- Provide hands-on experience by performing a series of **wireless laboratory experiments** with a # of important lab instruments.
- To gain experience in preparing formal **technical project *and* report**

Lab Experiments

- Laboratory Experiments (Wednesdays):
- Lab 1 - AM, PM & Frequency modulation
- Lab 2 - 802.11b Wireless LAN
- Study the relationship between throughput and noise/power ratio
- Lab 3 - 802.15 Bluetooth communications
- PJ. Lab - Special Wireless Experiments (SWE)

HW (Prelab) Sketch

- Pre-Laboratory Homework #1
- **Signals in Time and Frequency Domains**

Devoted to physical layer -> laboratory experiment is done with TA's

- Project must include a smartphone
- Each group will receive a different smartphone along with additional tools

RDS Sketch

- Submit the row/data sheet
- You need to predict some parameters to measure shaded boxes.
- Sinusoidal signal with signal amplitude of 2 V

Quiz Test Sketch

- Multiple-Choice
- Conceptual rather than computational

Abstract

- Report is implementing a mobile application that receiver medical data (electrocardiogram/ECG) from the Alive heart-monitoring sensor through Bluetooth and send the data to a server through TCP/IP
- Our team is responsible for retrieving medical data from the ECG sensor.
- Need a way to express results but also show negative sides of the experiment.

Grading

- HW (3) = 20%
- Lab report (1) = 20%
- Project (1) = 50%
- Quiz Test (1) = 10%
- RDS (2): P., No P.
- Final Grade (FG) 100%

Proposed project by choice:

- Project #1

RMS (root mean squared)

- It is about signal as well as basic theory.
- You will use a function generator that generates some carrier signal + modulator

Modulation; BK 4040 Function Generator

- Activate modulation on/off button
- Some carrier signals are changed in accordance with data
- Data signal and the dashed line is positive
- In this case, amplitude stays constant but when signal changes sign, it jumps.

CS M117 Final Lecture 5-19-16

a. Understand the properties of communication channels
b. Understand signal modulation, multiplexing, and multiple access processes.
c. Understand MAC Protocols for reliable and noisy channels
d. Understand Wireless LAN and PAN design and operations
e. Understand structures of Computer Communication systems (CS 31, 33, 118, or EE 132B)
f. Final comprehensive project requiring the student to re-design and re-think one of the experiments he/she performed.

- A periodic signal can be decomposed into A set of sine waves.