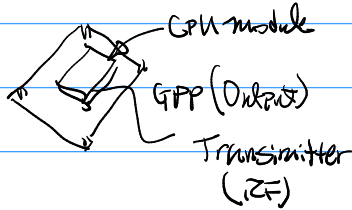August 22 (Monday) First Day of the Class
1. Organizational meeting.
2. "Green Sheet", github/hualili

Introduction

Building A Prototype System.
    Architecture Illustration



CPU module
GPP (Output)
Transmitter (RF)

August 25 (Wed)
  Note: 1° Grading Policy

Exams { Midterm 30%
        Final 40%

Projects & HW : 50%

Introduction

System Level Design of R.F. System
Build A R.F. System to Realize Handshaking Function.

Example: Create A Technical Spec. 8at System.

1° Target platform: LPC1769; LPC804; NXP
          BroadCom Pi, NvDA Jetson NANO

Final Presentation/Demo By the End of the Semester. In Class.

MAC Layer

2 Projects { Software Defined Radio — ASK { $R_x$  $T_x$ ~ $5.00-$60
              IIOT - LoRa RF. SX1276 ··· 433MHz
  1 Self Design Project   C.R. (Cognitive Radio)

---

Continued from the Design Spec.

2° I/O I/F: { SPI (Serial Peripheral I/F)
             GPP (General Purpose Port)

3° R.F. Frequency Range: 353~433 MHz.

4° Mod/Demod Technique: ASK
   "Amplitude Switch Keying"

5° Software Defined Radio, Programming Language: C/C++, Python.

6° Bit Rate: ~ 1Kbps

7° Rx end Over Sampling to Achieve Robustness, 2x ~ 10x

8° Range & Power Consumption:
   ~50-100ft; 5~9VDC, 200mA
       ~1000mW (FCC)

9° LISA (Linear Invariant Sync Algorithm) for Synchronization.
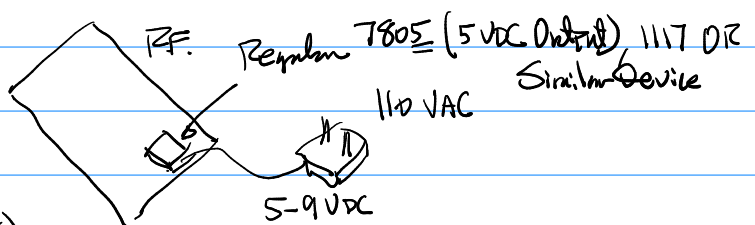   Sync Field: 32 Bytes, Ref: IEEE 802.11
           Fig.127

1° Scrambling/De-Scrambling Technique For Variable Orders 3rd order ~ 11th Order And Beyond.

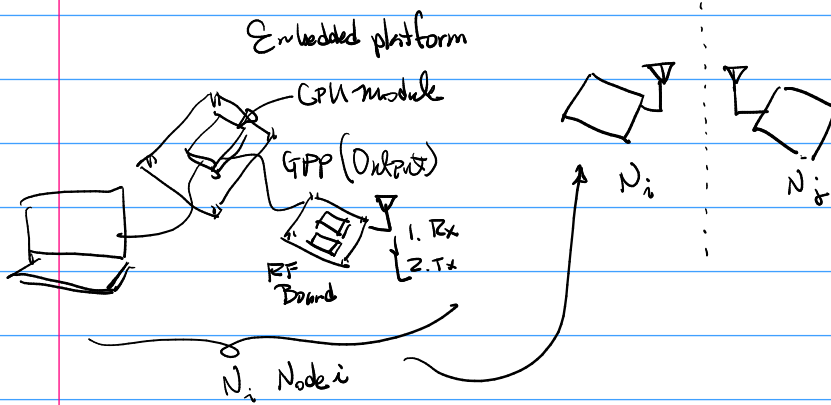Ref. IEEE 802.11x   Fig.131

Access code Form from the Front Desk.

R.F. Prototype Board Design.

Example:



R.F. Regulator 7805 (5 VDC Output) 1117 OR Similar Device
110 VAC
5-9 VDC

Embedded platform

CPU module

GPP (Output)

1. Rx
2. Tx

RF
Board

$N_i$ Node $i$

$N_i$

$N_j$

First, Consider Establishing Base
Band Signal Communication.