CENG 5434: Microcomputer Systems Design 10/12/2022

WELCOME 10/12/2022

REMIND ME TO RECORD

LAST TIME WE TALKED ABOUT ---

Special Microcomputers and Other Chips

This week we discuss wireless systems.

1a_RadioHistory_1TLH.pdf

1b_wirelessHistory_2TLH.pdf

2_5434_Wireless_LECTURE.pdf

2_aWireless_BluetoothVS_WiFiComparison chart.pdf

==========

3_5435_Wireless_Lecture3_IoT .pdf

4_5435_Wireless_LectureSmart HomeDevices.pdf

LECTURE 5

5_5434_Wireless_Lecturef22.pdf : Contents

Z-Wave vs. Zigbee vs. Wi-Fi! Smart Home Basics: How To Pick The Right Protocol

352,114 views 15:32

https://www.youtube.com/watch?v=v8-VNIQQiQE

Z Wave Vs ZigBee: Which Is Better For Your Smart Home?
https://thesmartcave.com/z-wave-vs-zigbee-home-automation/

Another approach – data through power lines.

https://en.wikipedia.org/wiki/X10_(industry_standard)

Automobile Applications of Wireless

https://www.cypress.com/products/automotive-wireless

V2V Automotive Applications

https://www.nhtsa.gov/technology-innovation/vehicle-vehicle- communication

https://www.youtube.com/watch?v=3z09fCqmILU

Video 2:44 min.

Microcontroller

PIC32MZW1 series Wi-Fi SoC is a 200MHz high performance 32-bit MCU with industrial **leading Wi-Fi connectivity** and rich peripheral options.

It has 1MB embedded flash and 256KB SRAM, empowering embedded designers to rapidly build complex IoT software covering WLAN, TCP/IP stack, RTOS, Cloud connectivity, and application. Various types of peripherals, such as Ethernet, USB, ADC, CVD touch buttons, and CAN, make PIC32MZW1 a perfect system core to realize the most application features.

Industrial-Strength Embedded Wi-Fi® Performs Under Pressure

https://ww1.microchip.com/downloads/aemDocuments/documents/WSG/ProductDocuments/DataSheets/PIC32MZ1025W104-MCU-and-WFI32E01-Module-with-Wi-Fi-and-Hardware-based-Security-Accelerator-Data-Sheet-DS70005425.pdf

Wireless Interfaces

- PHY:
  - IEEE® 802.11 b/g/n WLAN link
  - Single spatial stream of 20 MHz channel bandwidth
  - External FEM support for Power Amplifier (PA), Low Noise Amplifier (LNA), Transmitter/Receiver (TX/RX) switch
  - 2.4 GHz (2400 ~ 2483.5 MHz) ISM band
- MAC:
  - Infrastructure BSS STA mode
  - Soft-AP mode functionality
  - Active and passive scanning
  - Transmit power control support over temperature and voltage
- Security:
  - WPA3 personal (SAE and PMF-802.11w)
  - WPA2 personal, with options for WPA compatibility and PMF
  - WEP
- Harmony Networking:
  - Out of box support for MPLAB® Harmony v3 TCP/IP Stack
  - TLS v1.2 with symmetric/asymmetric crypto acceleration
- Wi-Fi Power Save Modes:
  - Wireless Sleep mode (WSM)
  - Wireless Deep Sleep mode (WDS)
- Wi-Fi Timestamping Support