“REQUIRE A POCKET SIZED SDR ,WHICH IS FULLY AUTOMATIC , CAN CONNECT TO THE INTERNET AND DO MORE”

~ PROBLEM STATEMENT

DECOL

A Compact Portable SDR

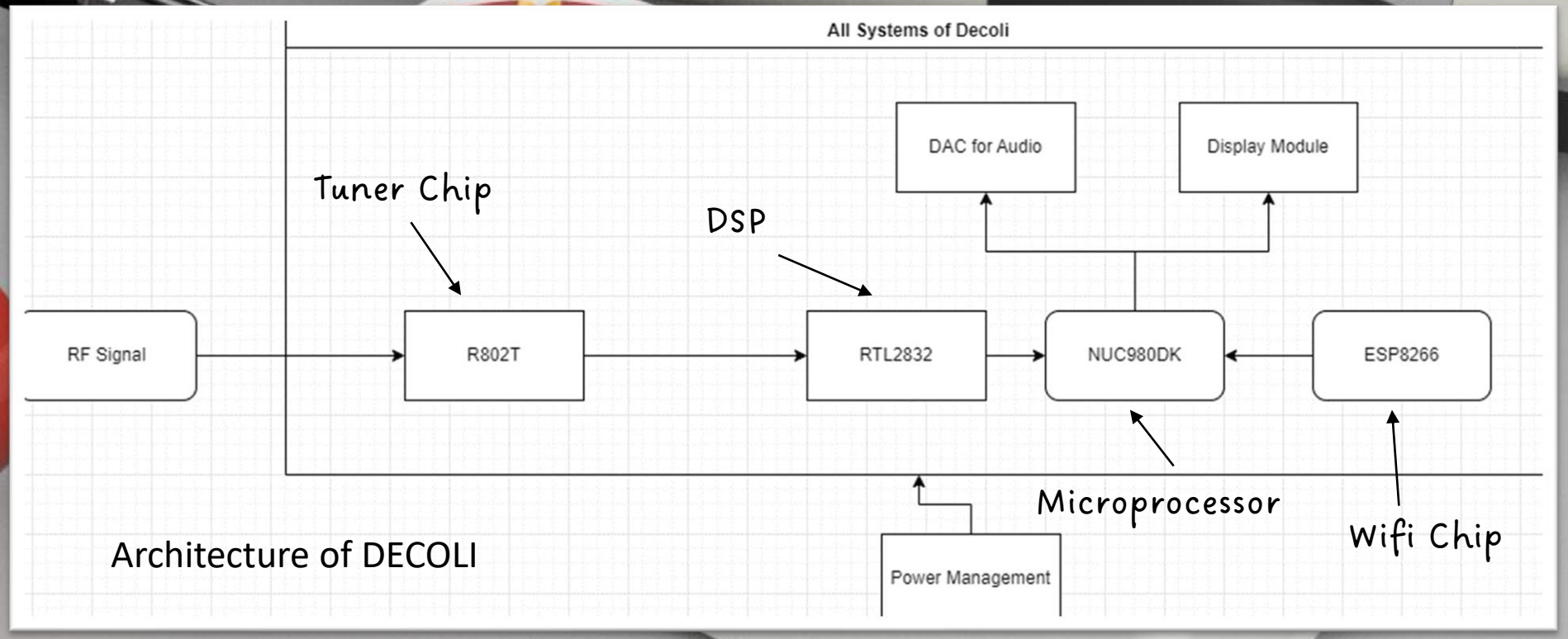
Author:

Suryasaradhi

Problem Statement and Solution

Problem Statement	Current State
SDR Capable of Eavesdropping	We created an SDR capable of Eavesdropping from 500khz – 1700Mhz
AI Automatic Demodulator	Implemented using SVM
Less power	3hrs Battery backup
Auto translate Detected Speech	Implemented using GCP
Decouple RX from TX	Planning for Implementation of filter based crystals

Architecture and Technical Details



Architecture of DECOLI

Software/Kernel : Python, C

Technologies Used: GCP, Pyrtlsdr, Nu-Openwrt, UHRP, GUISlice, Tensorflow for MCU

Specifications

Form Factor of Motherboard	Medium [57mm x 27mm x 10mm]
Copyright infringement	NONE
Inter-Connections	All On Single board
Hardware Technologies	• Wi-Fi - 2.5G – Onboard Antenna • HF Direct Sampling Mode • <1 PPM temperature compensated oscillator (TCXO) • Embedded Display and Navigation Controls • Battery Life up to 3 Hours • Oled Display • 3.7V Bias Tee • Switchable Boot Configuration (USB/SD Card) • Dedicated 24-bit Audio Chip for best quality.
RF Technologies	• Full RF Spectrum Sweep • Demod RF Transmissions • Save/Play Transmissions
AI Technologies	• Detection and Demod of Signals • Translation using GCP
Frequency Sweep	500Khz – 1766 MHz (BW: 3.2Mhz) (I have left Space for adding a downconverter for increasing frequency)

DECOLI

Stage 2 Prototype

Future Plans and Conclusion

- Implement downconverter and a LNA for extending frequency range
- Software switchable boot mode
- Decrease size and Increase battery lifetime by replacing LDO’s with buck converters
- PCB Impedance matching (Recheck)
- Implement Complete GCP translation services
- Implement Complete GUI
- Implement Buck switching converters for stepping up 3.7v to 5V for smoother operation of Nuvoton processor.
- LC filters for power supply ripple filters.
- Charge level indicator based on current flow.
- Write modular Software classes