BlueDentist

Bluetooth Monitoring Using Software-Defined Radios and GPU Processing

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Background

With the explosion of connected electronic devices, wireless security efforts are being demanded. BlueDentist records and identifies local Bluetooth devices, which are traditionally hard to track due to unadvertised presence and frequency hopping.

Overview

BlueDentist utilizes a software defined radio to collect data from a large band of frequencies. The on-board NVIDIA Jetson Xavier efficiently processes the large stream of data in order to provide identifying details of all local Bluetooth devices, recording them to the integrated SSD storage. The hardware platform is adaptable to monitor additional communication protocols.

Key Components

Bluetooth SDR: XTRX
- Monitors for Bluetooth activity
- 12 bit DAC/ADC Resolution
- Tuning range: 30 MHz to 3.8 GHz
- Up to 120 MSPS allows for high bandwidth monitoring

System GPU: Nvidia Jetson Xavier
- CUDA enabled: accelerates processing of radio data to identify Bluetooth signals
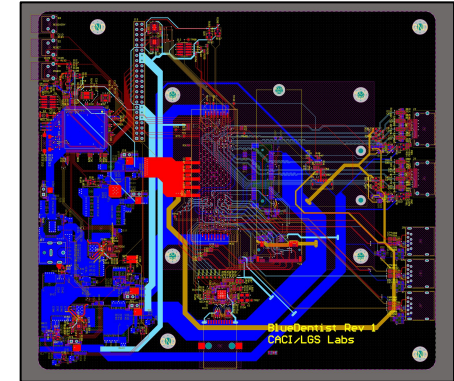- 512-Core Volta GPU
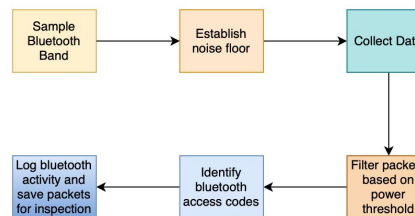- 64 Tensor cores

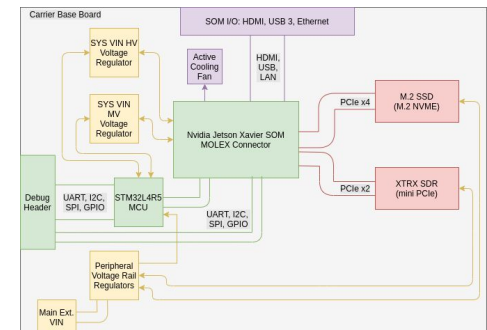**Supervisor MCU: STM32L4R5ZIT6**
- Manages GPU and board peripherals

Printed Circuit Board

Software Flow

System Block Diagram

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