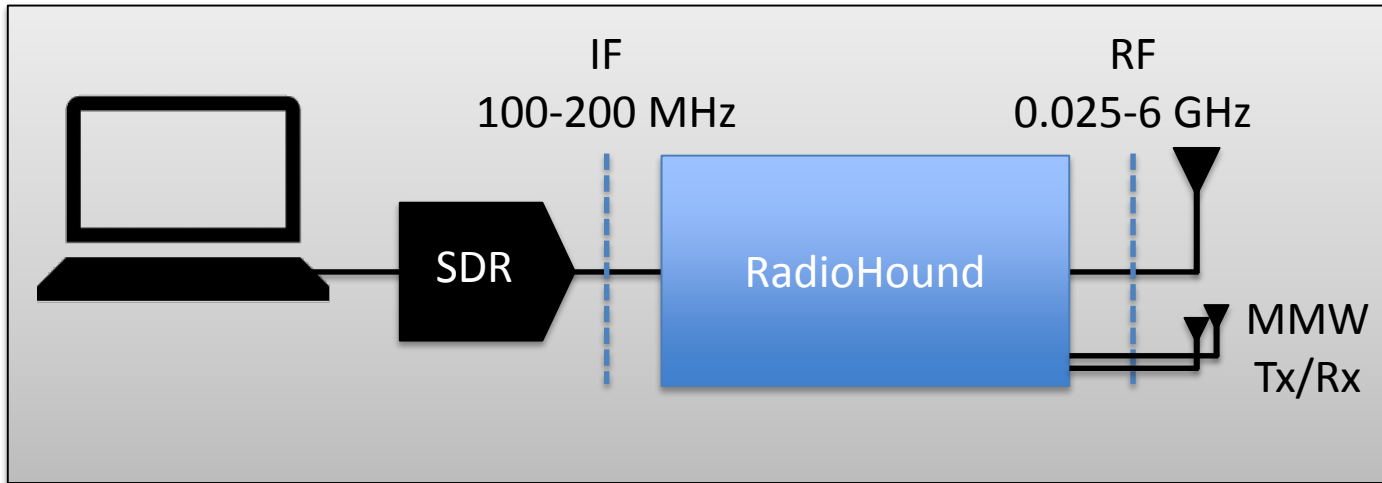
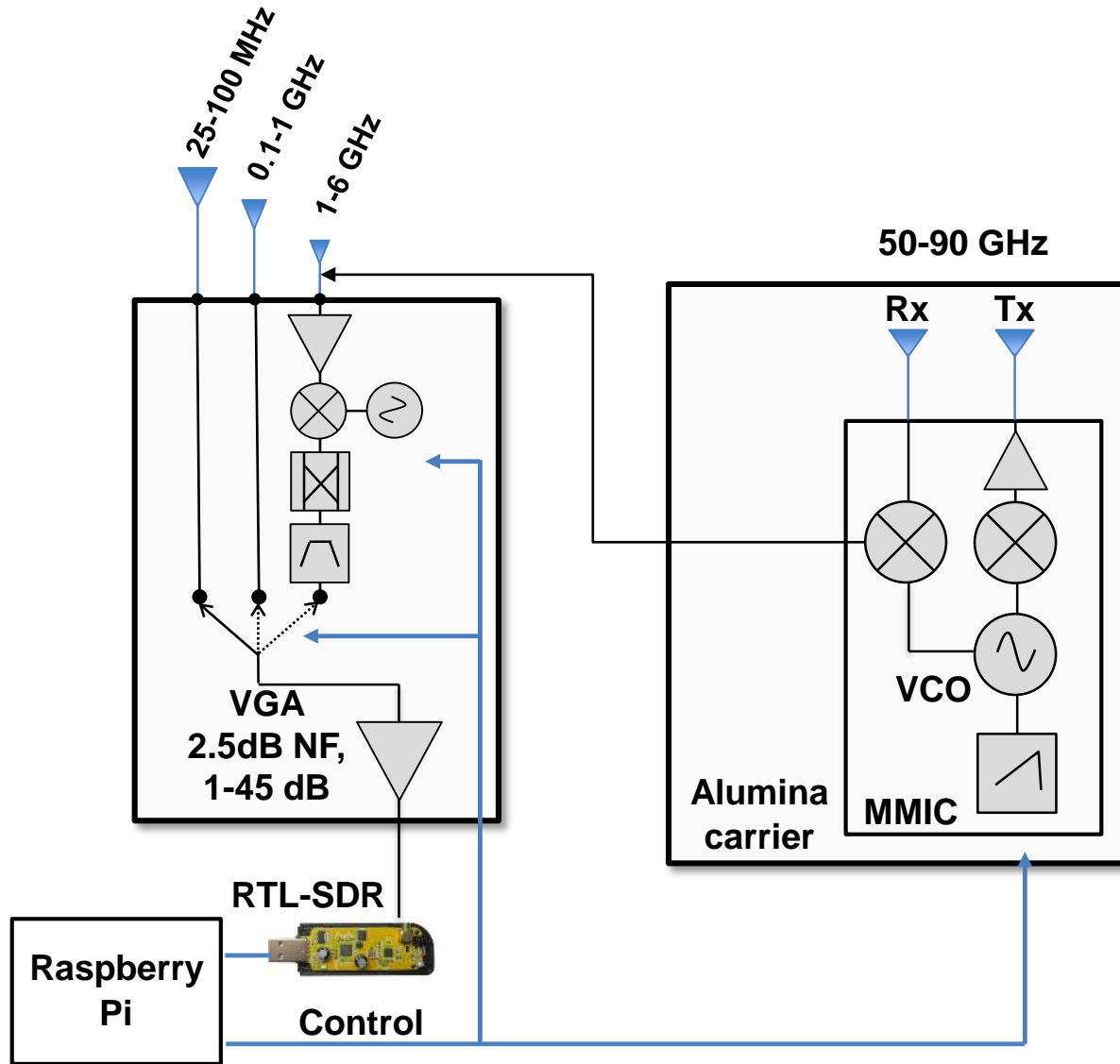


RadioHound: Pervasive & Persistent Spectrum Sensing

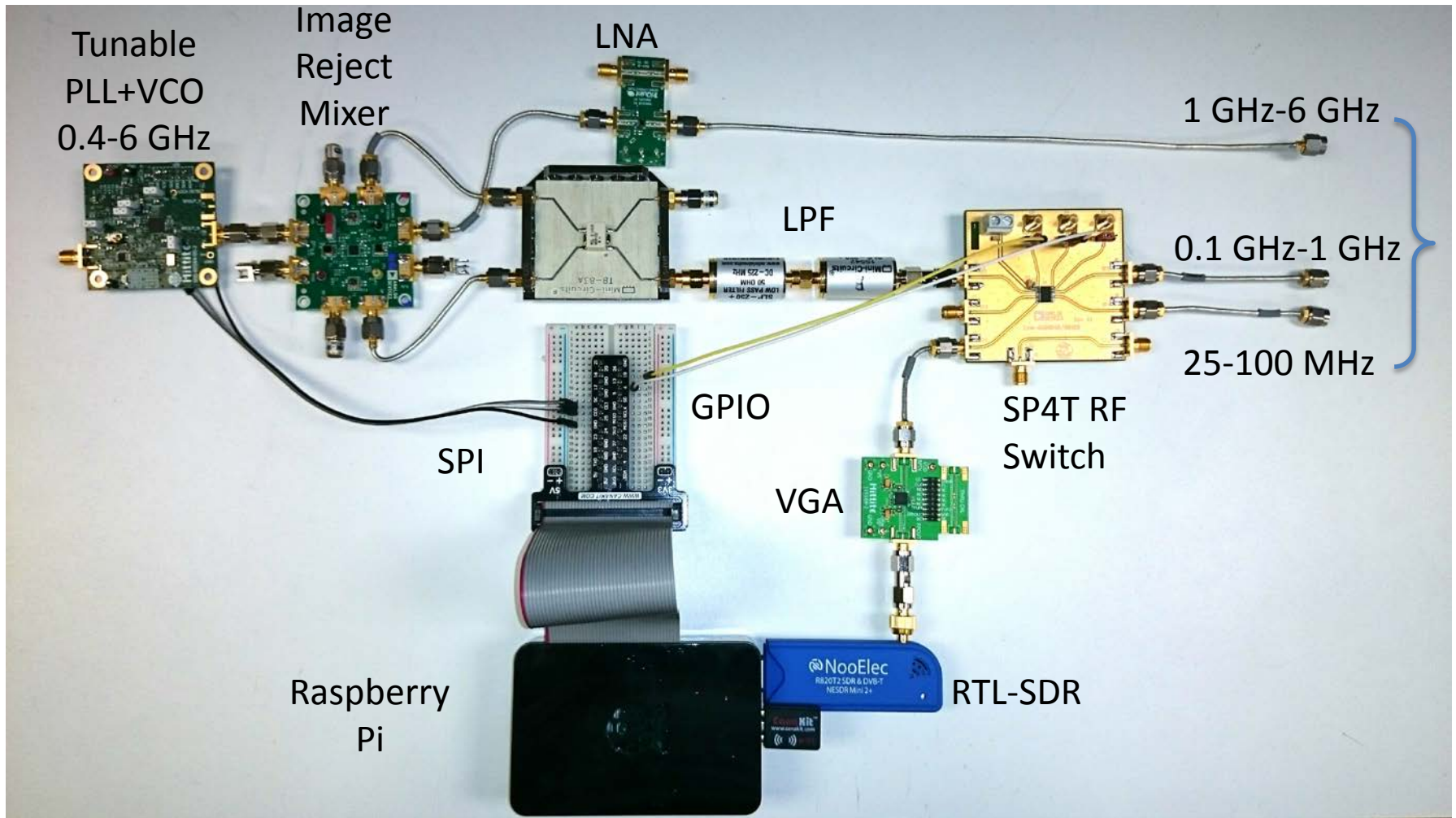


- RadioHound is a *low-cost, pervasive, persistent* spectrum sensor that leverages low-cost SDRs
- RadioHound + low-cost SDR: <\$70
- RF interface: three antennas covering 0.025 to 6 GHz, MMW Tx/Rx
- IF interface: 100-200 MHz allows for generic SDRs
- Signal conditioning: automatic gain control to maximize limited dynamic range of low-cost SDRs
- Mobile phone “dongle”

RadioHound System

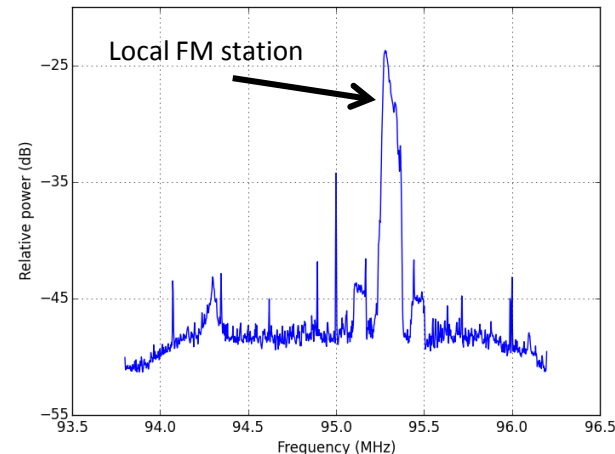
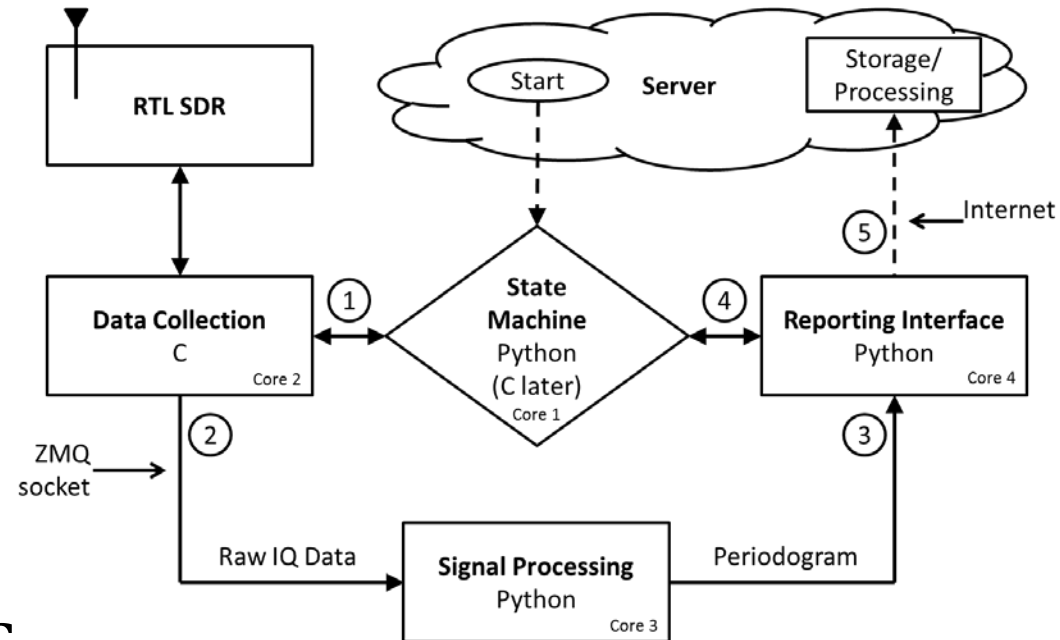


RadioHound Prototype



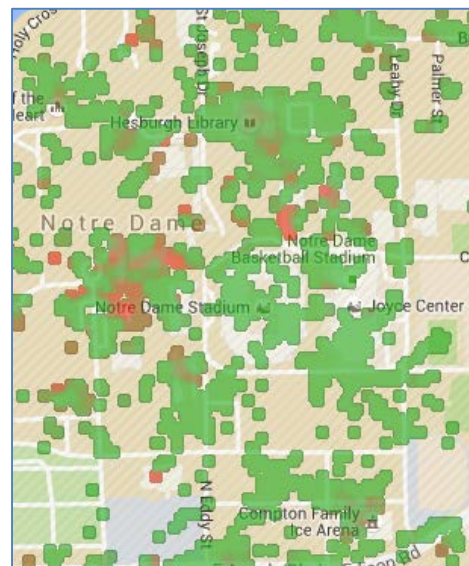
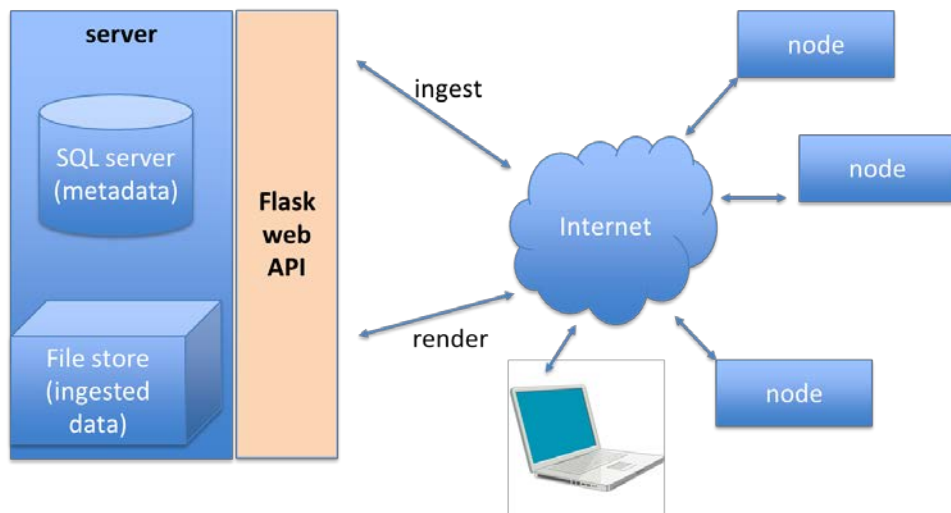
Software Control Loop

- Utilizes Welch Method to estimate PSD
- Python-based signal processing
- Threaded RTL library in C
- Utilizes Zero Message Queuing (ZMQ) to pass information



Server Architecture

- Current Functionality
 - Initialize database
 - Ingest IQ data
 - Ingest spectrum measurements
 - Plot spectrum measurements
- Planned Functionality
 - Notional heatmap from opensignal.com
 - Enhanced visualization of spectral data
 - Constrained by geo-coordinates
 - Constrained by time of collection
 - Constrained by frequency range



Status

- Team of six faculty and five students
 - Hardware: Hochwald & Chisum
 - Algorithms: Pratt and Laneman
 - Software & Visualization: Flynn and Striegel
- Phase 1 is eight months through
 - Software server-client structure roughly in place
 - Characterizing hardware

Next 4 Months

- Phase 1 Complete in July 2016
- Basic demo to include:
 - Easy installation
 - no specialized knowledge
 - Server/client control
 - Scalable to large number of clients
 - Basic visualization
 - Limited frequency range
 - Hardware verification
 - Ready for miniaturization and power reduction
- Documentation of HW/SW and Phase 2
 - Requirements documents available on request