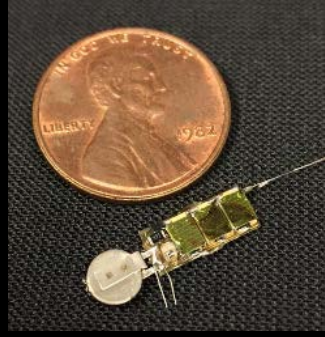
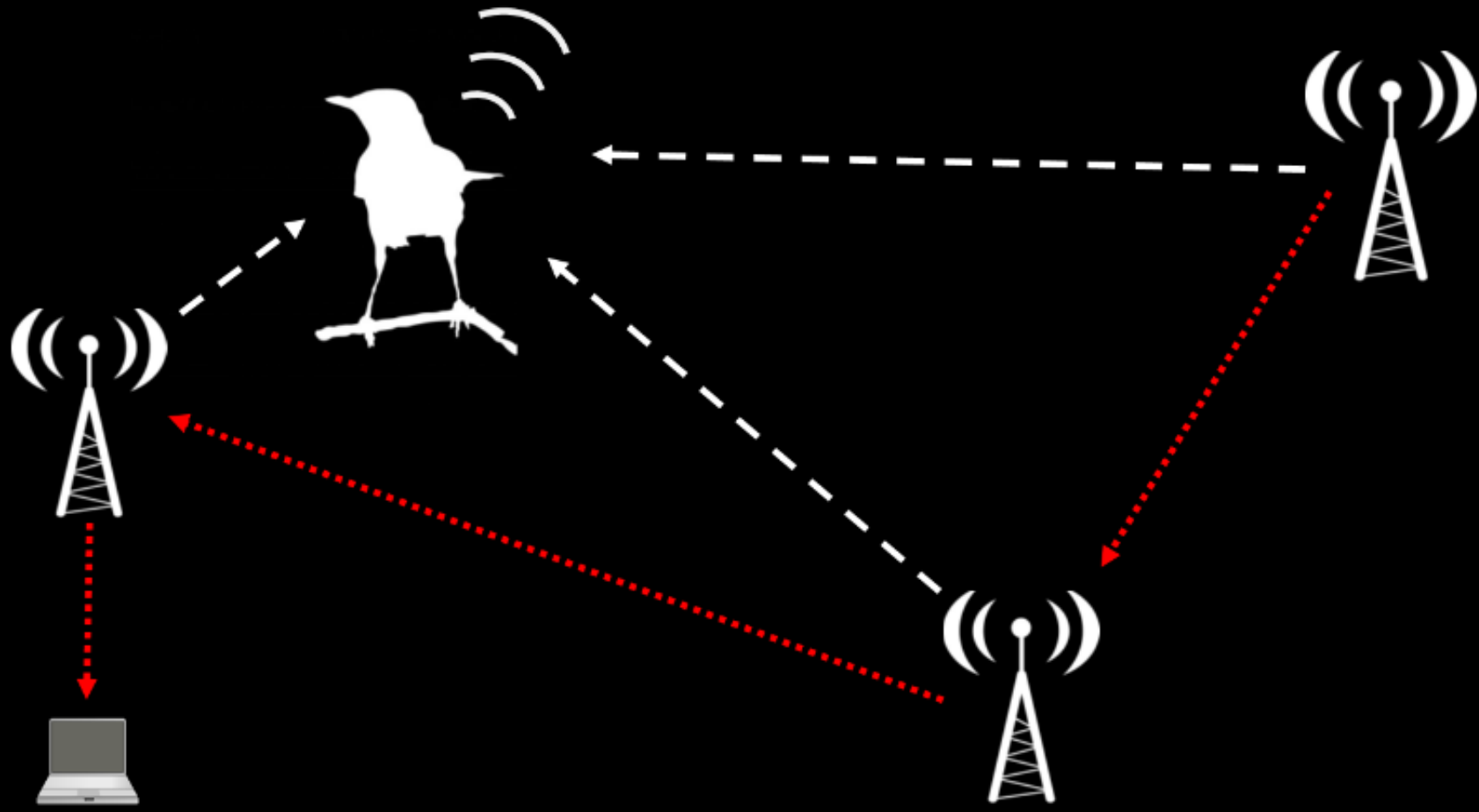
AMRUPT

(Animal Movement Research Using Phase-based Trilateration)





Management plan

Task Name	Start Date	End Date	Duration	% Complete	Status	Assigned To
Phase 1(AOA)	**18-01-24**	**18-05-25**	**88d**	**8%**	**In Progress**	
Project Proposal	18-01-24	18-02-21	21d	100%	Completed	Russell Silva, Mei Yang, Justin Cray, Peidong Qi
Antennas	18-02-21	18-03-21	21d	0%	In Progress	Justin Cray
RF Switch	18-02-21	18-03-21	21d	0%	In Progress	Justin Cray
CC1310 I/Q Extraction	18-02-21	18-03-21	21d	0%	In Progress	Russell Silva
CC1310 to Raspberry Pi UART Connection and Datalogging	18-02-21	18-03-21	21d	0%	In Progress	peidong qi
Phase Disambiguation and Angle of Arrival Calculation	18-03-21	18-05-15	40d	0%	Not Started	Russell Silva, Mei Yang, Justin Cray
RF Wave Reconstruction and Matlab Simulation	18-02-21	18-04-18	41d	0%	In Progress	Mei Yang
Angel of Arrival Measurement	18-02-21	18-05-15	60d		In Progress	
Testing	18-04-24	18-05-25	24d		Not Started	
Separate Demodulator/ADC (Plan B Solution)						Russell Silva, Mei Yang, Justin Cray, Peidong Qi

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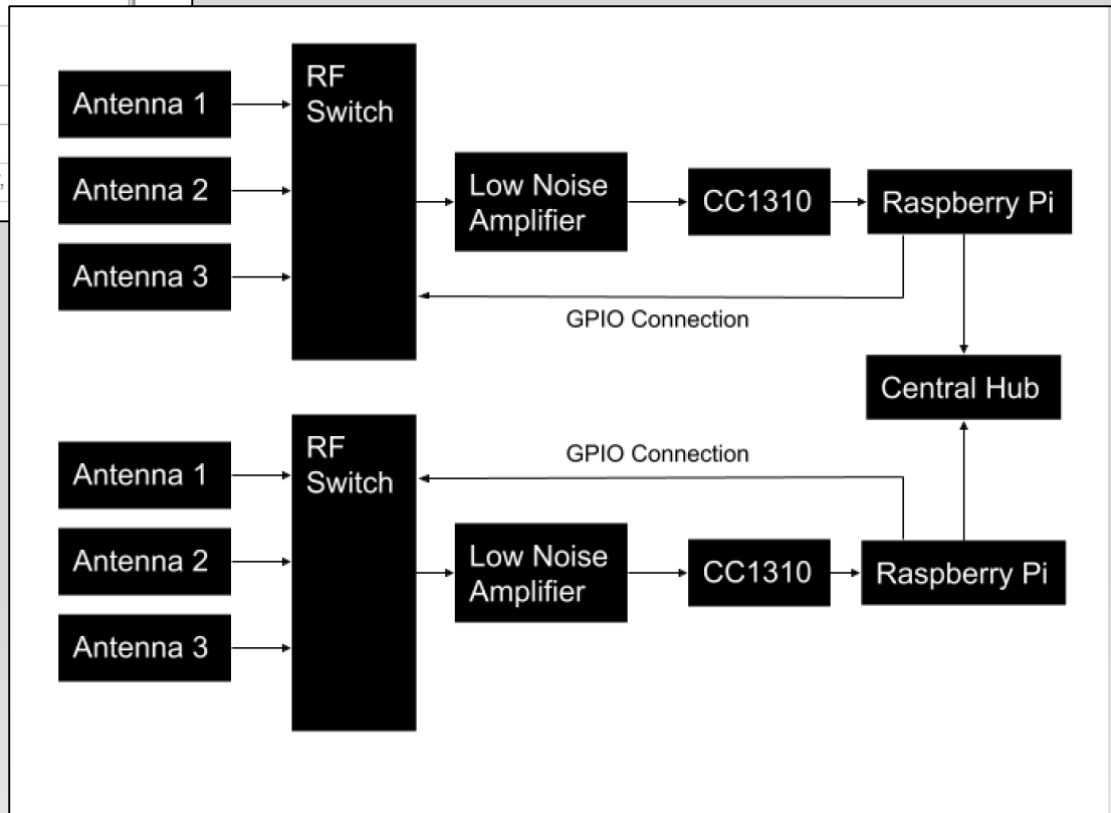

Justin Cray, spring 2018 initial goals

Antenna design:

- Determine best type of antenna to use (whip, dipole, COTS PCB)
  1. Isotropic
  2. Sensitive
  3. Physically robust and high tolerance in manufacturing specs
  4. Minimally impacted by being close to other antennas in an array
  5. Low cost
  6. Able to receive all potential frequencies to be used (150 MHz - ~300 MHz)
- PCB design (antenna footprints, LNA, trace specifications, ground plane)
- Testing

RF switch:

- Evaluate pros/cons of RF switches
  1. Isolation
  2. Insertion loss
  3. Switching speed
  4. Slew rate
  5. Cost
- PCB design (RF switch footprint requirements [e.g. isolation to avoid parasitic effects])
- Testing
- Work with Mei to model required specs for a given level of precision of AOA

Consult with Dr. Kan

Russell Silva, spring 2018 initial goals

Phase extraction from CC1310:

- Determine how to extract I/Q data from CC1310
  - Plan A: Make contacts with TI to identify correct way to update I/Q data register
  - Plan B: Work with others in the AMRUPT group to troubleshoot code
- Work with Peidong to determine format of resulting data (is it a binary text file?)
- Work with Mei to do RF simulations to determine required sample rate
  - Can the interrupt be triggered, and buffer be updated and emptied quickly enough? (**Highest Nyquist frequency is ~600 MHz!**)
- PCB design (CC1310 footprint, power supply, trace specifications)
- Testing

Consult with Dr. Kan

Peidong Qi, spring 2018 initial goals

Transfer of phase data from CC1310 to Raspberry Pi:

- Work with Mei and Russell to do RF simulations to determine required sample rate (stay above Nyquist frequency) and bit depth (minimize quantization error)
- Determine how to transfer data from CC1310 to the Pi
  - Plan A: UART, if simulations suggests UART speed is sufficient
  - Plan B: SPI, otherwise
- Work with Russell to determine the format of resulting data (is it a binary text file?)
- Write program to decode, format, process, and save resulting phase information
- PCB design (Raspberry Pi shield design, power supply, trace specifications)
- Testing

Consult with Dr. Kan

Mei Yang, spring 2018 initial goals

RF wave reconstruction and simulations:

- Work with Peidong and Russell to do RF simulations to determine required sample rate (stay above Nyquist frequency) and bit depth (minimize quantization error)
- Work with Justin to define required RF switching characteristics
- Learn Dr. Kan's simulation model and adapt it for our system architecture

Consult with Dr. Kan