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Critical Design Review

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Team

Saurabh Gupta

PCB, Power

Bryan Lavin-Parmenter

Software Architecture

Brandon Pon

PCB, SoM

Neil O'Bryan

Peripherals

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Vision

To build a device that will allow astronauts to path-find on
unknown terrains in space

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Design
Assumptions

No trails, roads, or landmarks for way-finding

Localization is available (i.e. GPS)

Astronauts are walking, not traversing via rover

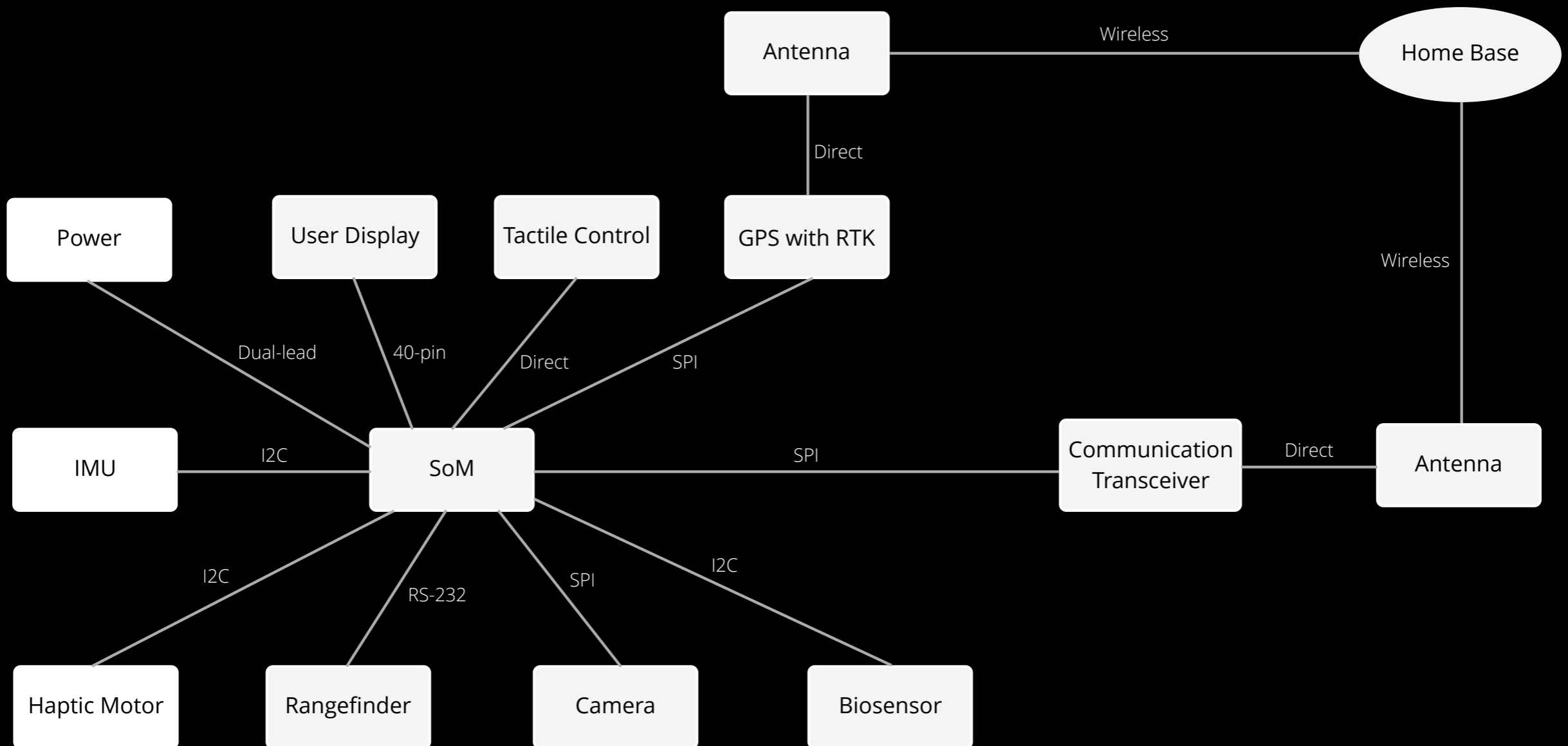
Astronauts are partially physically encumbered

Astronauts are not just navigating, but are multi-tasking while navigating terrain

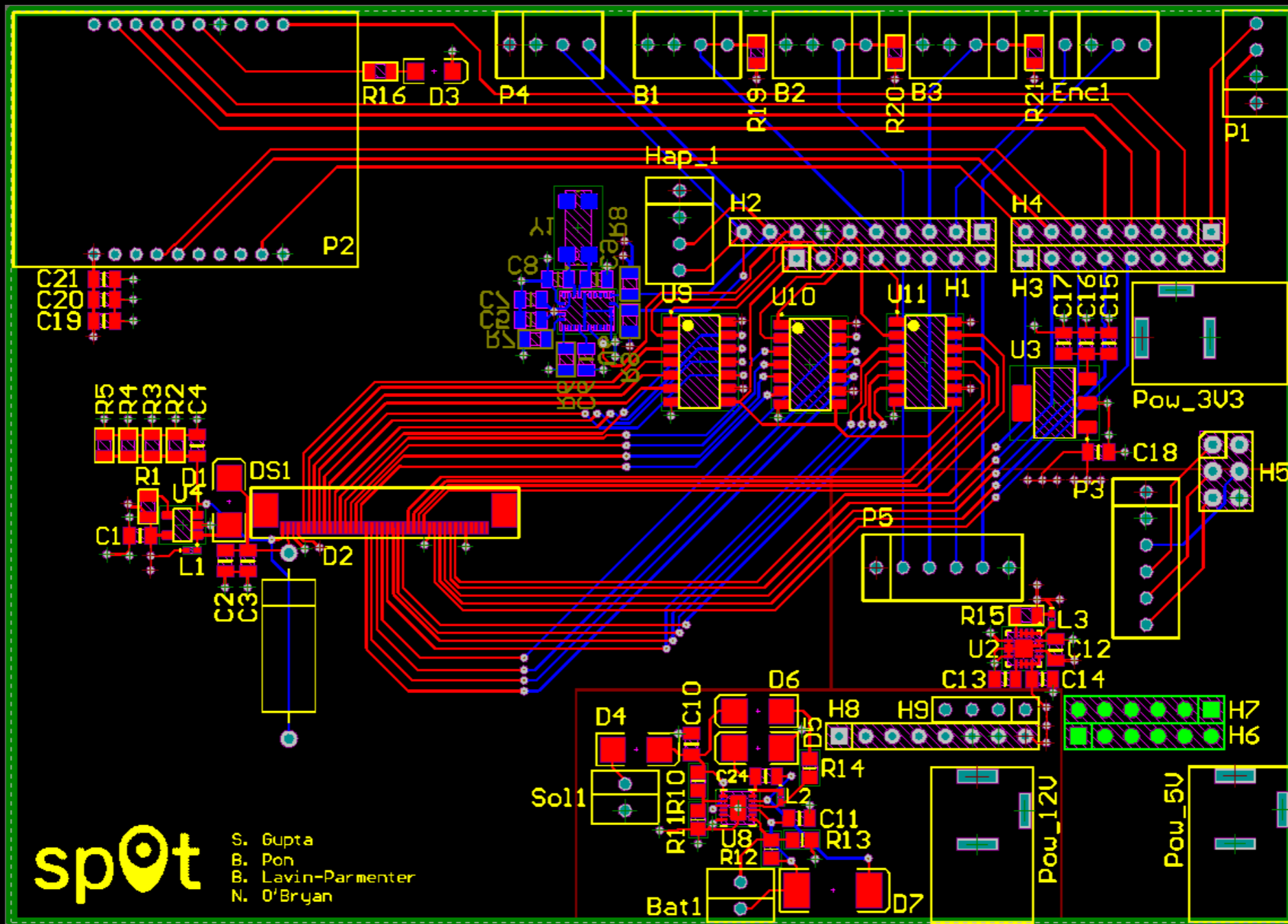


Design

System Architecture



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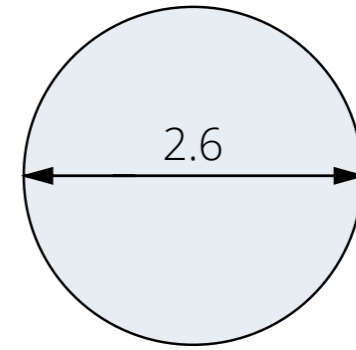
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Enclosure

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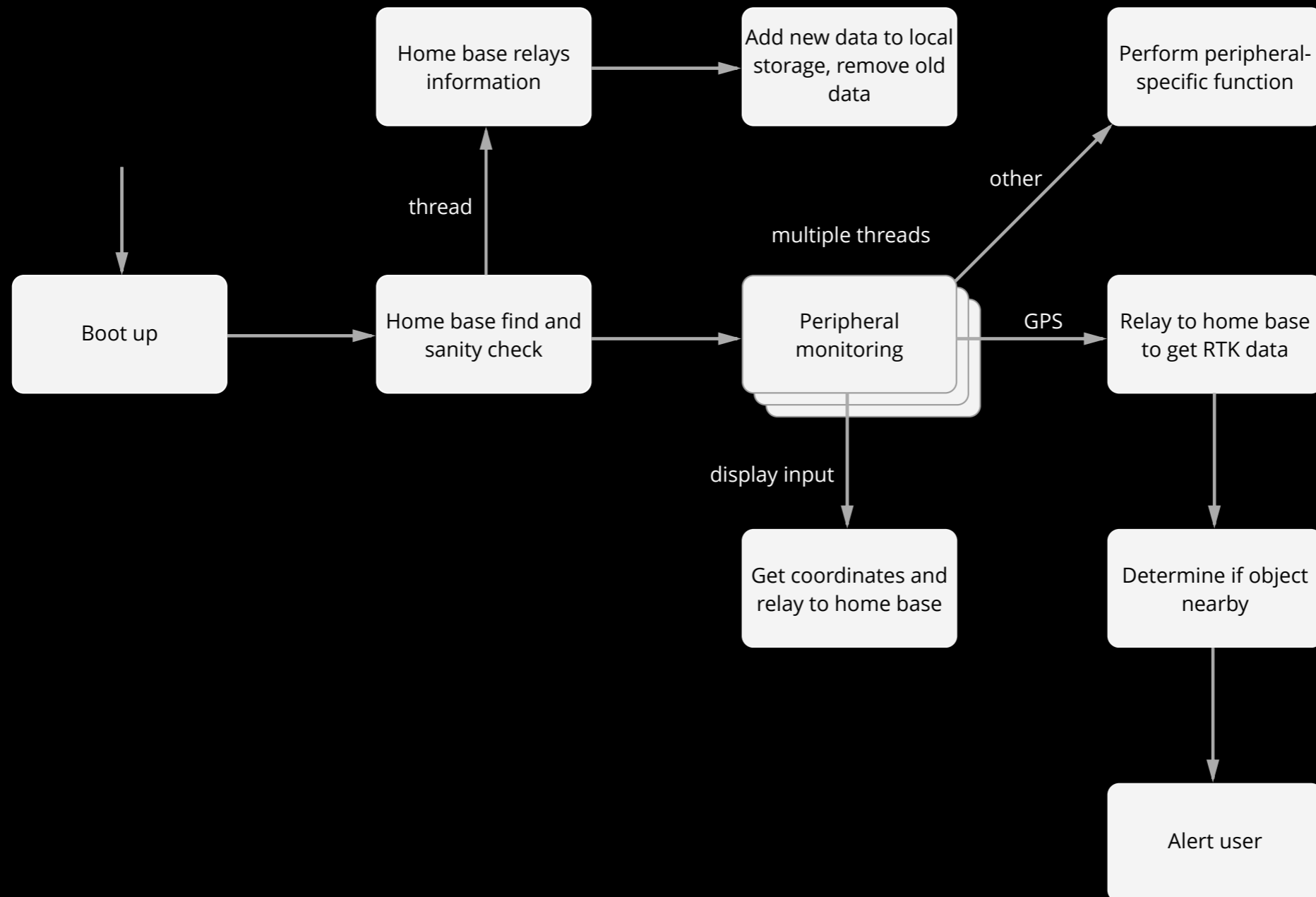
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Design

Software Architecture



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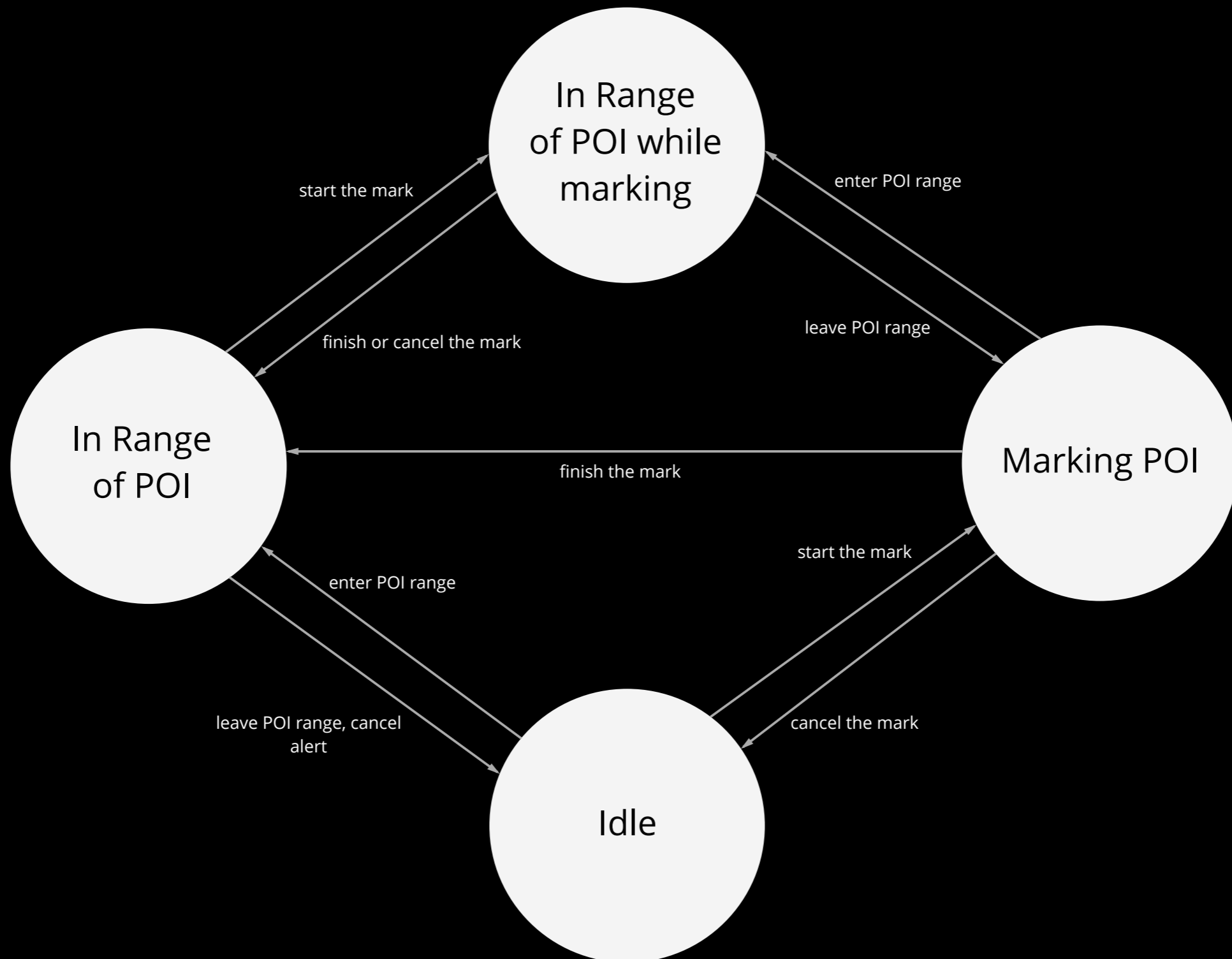
Software Methodology: Test-Driven Development

TDD: Testing before implementation

Write code tests that fail before writing new implementation logic

2P Review: All code must be reviewed and critiqued by another team member

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Bill of Materials

SMT + PCB Fabrication	90
PYNQ	65
XBee Transceiver	43
XBee Antenna	8
Display	30
GPS Breakout	240
GPS Antenna	12
Rangefinder	55
Haptic Motor + Controller	10
Heart Rate Sensor	20
Camera	69
Total	approx. \$650

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Timeline

Winter 2018

Interface PCB with peripherals

Continue building software architecture and testing protocols

Prepare for PCB spin #2



Collaborators

Dr. Luke Theogarajan

University of California, Santa Barbara

Dr. Jessica Marquez

NASA

Dr. Richard Joyce

NASA

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Q & A