Team
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Mentors
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NASA
Communicating data is TEDIOUS
Astronauts are **COSTLY**

$10-100$ thousand per *hour* of astronaut time

$>100$ hours spent outdoors on the moon
The SPOT Solution
System Architecture

- Power
- User Display
- Tactile Control
- GPS with RTK
- Antenna
- Home Base
- IMU
- PYNQ
- Haptic Motor
- Rangefinder
- Camera
- Heart Rate Monitor
- XBee Transceiver
- Antenna
Software Architecture

- Boot up
- Home base find and sanity check
- Peripheral monitoring
  - Add new data to local storage, remove old data
  - Perform peripheral-specific function
  - GPS
    - Relay to home base to get RTK data
- multiple threads
- thread
- display input
  - Get coordinates and relay to home base
  - Determine if object nearby
    - Alert user
What’s left?

Making the enclosure

- Refine design
- Build it

System integration

- Complete “peripheral” functionality
- Turning functionality into features
- Software backend to support features

Develop the UI

- Integration of peripherals with UI
- What will the astronaut see on the screen?
How to make this better?

**Actual path-finding**
Implement path-finding algorithm to get shortest & safest path

**Satellite overlay**
Map the actual satellite image for more accurate information

**Hopping network**
Expand the range by using other devices in the network
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