Canary-X Communication Protocols

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Company Background:

Lunar Outpost Inc. is an advanced technology company with a focus on developing technologies that have both terrestrial and space applications. Comprised of engineers with experience working on NASA, defense, and commercial programs, Lunar Outpost is engaged in contracts with the U.S. Air Force, NASA, local and state government organizations, and leading research institutions. Other current projects include a prototype life support system for Lockheed Martin's Lunar Habitat module; the Lunar Prospector (MAPP), a rover designed to map resources on the Lunar surface; the Bloomberg Mayor's Challenge; Denver's Smart Cities Initiative and more...

Description of Work to Be Done:

The work to be done is towards a Canary-X module that contains a variety of communication protocols including Bluetooth, Ethernet using W5500 chip, Wi-Fi, and Cellular Connectivity using a SARA-UBLOX module. With the communication protocol in mind, the software will work in tangent with sensor gathering capabilities periodically in order to send data across the network.

The student team will be focused on programming an ARM processor to send data via the various communication protocols. Test hardware will be provided.

Canary-S Module (Cellular connectivity)

The students will be involved in every phase of the project 'from design through implementation'. During the design phase the students will interact with Lunar Outpost engineers to see what will provide value for operation. From there the project overview will be created and the work divided into tasks.

As a final product, the software will run on an ARM processor and will interact with different communication protocols in order to establish a stable connection. Once the connection has been established, data will be gathered from third party sensors and send data across the connected network and communicate to Lunar Outpost's servers adhering to specific security protocols. The end product should be able to switch between communication protocols without major delay or loss of data.

Justin Cyrus, the CEO of Lunar Outpost, will be managing this project on the Lunar Outpost side. Mr. Cyrus has extensive software development and project management experience and can help mentor the student team throughout this course.

Desired Skill Set for Students:

We understand that all the students in the group might not have the desired hard technical skill. As long as they have the ability to problem solve and the willingness to learn then our engineers can help teach some of these hard-technical skills.

- C++
- Arduino Experience
- PHP
- HTML/JS/CSS

Preferred Team Size: 3-4 Students

Given the scope of this project a group of 4 students is preferred but 3 students could also excel given they are willing to problem solve and learn.

Internships at the End of The Course:

We are happy to consider offering internships at the end of the course. During the Summer Field Session, we had 3 out of the team of 5 continue on with us.

Location Where Work Should Be Performed:

We have offices in Golden and in Boulder, CO. The office in Golden, CO is located at 17700 S Golden Rd Unit 102 and has space for a student team. This office is less than a 5-minute drive from CSM campus and should provide a convenient location for the students to meet. We also provide free beverages and snacks to keep the team fueled throughout the day.