

# Senior Software Developer - High Altitude Payload

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## Description

SFU Rocketry is seeking Senior Software Developers to join our Software/Firmware Subteam working on our High Altitude Payload (HAP) project. On this team you will primarily be working on developing the flight and ground station firmware for our stratospheric balloon project. This will involve developing performant code that will need to run with hard real-time constraints. This position has many different aspects and is open for your exploration and creativity in the areas of positional mapping, graphical interfaces, sensor fusion, real time operating systems, flight control redundancy, and more.

## Duties & Responsibilities

- Develop software to run within freeRTOS real time operating system and/or embedded linux environment
- Develop and modify hardware drivers to interface with sensors and peripheral devices. These include
  - Inertial Measurement Units (IMU)
  - Global Navigation Satellite Systems (GNSS)
  - Long range radio communication modules (Low-GHz RF)
  - On-board cameras
  - Barometers
  - External rewritable flash memory
- Manage multiple parallel processes within the RTOS environment, designing and validating for robust and mission-critical operation
- Develop tests to validate the firmware directly with in-lab and in-field hardware
- Collaborate and communicate with RF/Avionics hardware engineers about requirements, needs, and capabilities
- Program sensor fusion filters for positional mapping and flight path predictions
- Develop graphical interfaces for reporting positional readouts and predictions
- Assist in getting SFU Rocketry to the edge of space!
- Contribute with a minimum of 5 hours of work and 1 hour of meetings per week

## Key Qualifications

- Firmware and embedded systems
  - Arduino, Raspberry Pi, other microcontrollers and sensors
- Low level C or C++
- Serial communication protocols (SPI, I<sup>2</sup>C, UART, etc)
- Low level operating systems knowledge
  - Interrupts, processor scheduling, parallel threads, pointers, memory structure
  - Linux, freeRTOS knowledge is an asset
- Sensor Fusion experience is a strong asset
- Advanced math knowledge is an asset
- GUI or Webapp development is an asset
- Simple electronics hardware knowledge (breadboarding, voltage and current concepts)

- Must be able to work independently and within teams
- Strong self-learning ability
- Creativity, ability to think outside the box, is a strong asset
- Thorough attention to detail
- Self-starter, inspired to initiate action
- Professional communication skills, verbal and written

## Education & Experience

- Students pursuing a Computing Science, Software Systems, Computer Engineering, or equivalent undergraduate or graduate degree at Simon Fraser University (preferred)
- Preference for third year if in undergraduate studies
- Faculty or staff members of Simon Fraser University are welcome to apply
- Preference for this role given to those with related experience in key qualifications, though all levels of experience are encouraged to apply

## Job Details

- Part-Time / Casual
- Volunteer Student Design Team Position
- Hybrid - Surrey SFU Engineering Building
- Commitment for a minimum of 9 months after onboarding
- Frequent promotion opportunities to Lead positions

## Statement from SFU Rocketry

SFU Rocketry is an inclusive and equal opportunity organization. We welcome, include, and respect all regardless of race, colour, ancestry, place of origin, religion, family status, marital status, physical disability, mental disability, sex, age, sexual orientation, gender identity or expression, political belief, or conviction of a criminal or summary conviction offence unrelated to employment.

SFU Rocketry is Simon Fraser University's largest active design team in the university's history, and has a strong reputation to uphold. Our members are highly sought-after and have been actively recruited for permanent and co-op intern industry positions. We operate as a professional organization, where professional conduct is required and expected from all SFU Rocketry members at all times.

## Learn More about SFU Rocketry

Visit our website - <https://www.sfurocketry.com>