

Senior Software R&D - Simulation and Controls

Description

SFU Rocketry is seeking Senior Software R&D members to join our Software/Firmware Subteam working on our advancement projects. For this position, we are looking for late-degree undergraduate, or graduate students who wish to implement their research topics on tangible, real world systems! On this team you would be developing the basis for the simulation and control of our various current and future flight-capable vehicles and engine fluids related systems. You would implement complex control algorithms, and perform data analytics for the control, validation, and optimization of the aforementioned systems. We are exploring the possibility of offering this as a faculty sponsored research position for Honours, Masters, or PhD candidates.

Duties & Responsibilities

- Work with our existing system models, and develop new models as upgrades are made to our engine and current and future flight capable vehicles are developed
- Develop rocket guidance, navigation, and control algorithms for fuel-optimized trajectory planning
- Work with our fluids team to model, simulate, and optimize our liquid rocket engine performance
- Fit real-life sensor data acquired by our in-field and in-lab testing and data logging to your models
- Work on tertiary subsystem-relevant algorithms needed by our software teams, JPEG image compression for example
- Work with the software teams to implement your algorithms on real-life microcontrollers as flight vehicles get developed
- Work on the control algorithms and simulations for our systems to work robustly in a wide array of noisy and chaotic systems
 - Are you interested in landing rockets?
- Contribute with a minimum of 5 hours of work and 1 hour of meetings per week
 - Different timeline applies for sponsored research

Key Qualifications

- Simulations, modelling and control
- Matlab, Simulink, Python
- Theoretical control theory knowledge and methods
 - PID control theory and state space control
 - Discrete, Robust and Model-Predictive Control or willingness to learn is an asset
- Monte carlo and other chaotic simulation method
- Numerical optimization knowledge and methods
- Advanced math knowledge
 - Vector calculus, complex domain, Laplace and Fourier transform
 - General physics, fluids, electromagnetics knowledge
- Machine learning, deep learning, and genetic algorithms is an asset
- Computational fluid dynamics knowledge is an asset
- 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, Mathematics, Computer Engineering, Engineering Physics, or equivalent undergraduate or graduate degree at Simon Fraser University (preferred)
- Preference for third/fourth year undergraduates or graduate students
- Faculty and Researchers 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>