

Summary:

Imagine watching HUNDREDS of drones that YOU designed all flying together in a choreographed light show. Arrowonics is a startup company working on drone light shows using state of the art swarm technology. Using our prototype drones, Arrowonics became the first and the only company in Canada capable of flying large fleet of drones for entertainment. Arrowonics has started a collaboration project with Ryerson University to research and develop new path planning algorithm and state estimator to improve the show design efficiency and drone reliability. Arrowonics/Ryerson is currently looking for a Post-Doc Fellow to fill this research position.

You'll lead the design of a state-of-the-art multi-vehicle path planning algorithm to guide the drone swarm from one art design to the next, while ensuring they do not collide with one another. Additionally, you'll be responsible for improving the current state estimator, so that the drones can fly in larger range of weather conditions. You will be working under Prof. Anton de Ruiter of Ryerson University while doing your research, and will have regular interaction with technical staff from Arrowonics for implementation.

Key Responsibilities:

1) Path Planning

- Review and evaluate various path planning algorithms from existing literature
- Select the path planning algorithm most suited for Arrowonics' unique needs
- Implement and Improve upon the algorithm in simulation

2) State Estimation

- Review and evaluate various state estimators used for quadrotor UAVs
- Understand existing state estimator used by Pixhawk PX4 autopilot
- Improve the existing state estimator in simulation to include gust rejection
- Implement the new and improved state estimator on a drone and perform flight tests

Skill Requirements:

- PhD in Electrical, Mechanical, Aerospace Engineering, or other relevant fields of study
- Solid knowledge in path planning algorithm and state estimator design
- Experience in Matlab and Simulink to create complex models, estimators, and simulations
- Proficient in C/C++ for implementation strongly preferred
- Good understanding of Pixhawk PX4 autopilot firmware strongly preferred
- RC/drone pilot is a bonus

Interested applicants are requested to contact Prof. Anton de Ruiter at aderuiter@ryerson.ca