

Postdoc, PhD and Masters (thesis research) positions in ECE, University of Waterloo

Dated: 15-Dec-2022

Yash Vardhan Pant and Sebastian Fischmeister at the Department of Electrical and Computer Engineering, University of Waterloo, invite applications for the following positions:

- 1) **Postdoctoral Fellow** (or Senior Research Associate for exceptional candidates) (PDF-2022), opening from January 2022.
- 2) **PhD student** (PhD-1-F2022) for Fall 2022
- 3) **MASc student** (MASc-1-F2022) for Fall 2022

Overview of positions: The positions will focus on problems at the intersection of control theory and machine learning, with applications to autonomous systems, especially in the automotive domain. The successful candidates will be co-supervised, and are expected to advance the state-of-art in the area of safety-assurance of closed-loop systems with machine learning-based components (e.g., for state estimation, perception, and control) in the loop. Based on the research interests and background of the candidates, the research can focus on topics such as supervisory control of ML-based decision-making systems, safe reinforcement learning, bridging the simulation-to-reality gap in learning-based control, correct-by-construction synthesis of ML-based controllers, testing and verification of autonomous systems, etc. The position will involve interaction with a Tier-1 automotive manufacturer, and the successful candidate will have the opportunity to apply their research to a full-scale autonomous vehicle and other robotic systems. Successful candidates are also expected to publish (and present) their research at top conferences and journals.

Required Qualifications:

- Strong mathematical foundations in linear algebra, optimization, and probability, along with an interest in dynamical systems and control of dynamical systems.
- Proficiency in programming with Python.
- **For Postdoctoral fellows:** PhD in Systems and Control, Machine Learning, Robotics, Mathematics, Computer Science, or a related area.
- **For PhD students:** Masters (or in exceptional cases, a Bachelors) degree in Systems and Control, Machine Learning, Robotics, Mathematics, Computer Science, or a related area.
- **For MASc students:** Bachelors degree in Engineering, Mathematics, Computer Science or a related area.

Additional qualifications:

Plus-points if you have one or more of the following skills (please highlight/list them in your cover letter):

- Knowledge of C++
- Familiarity with Matlab
- Experience with deep learning packages in Python (such as Tensorflow, Pytorch, Keras)
- Experience with optimization packages such as Casadi, CVX, Yalmip etc.
- Experience with Control toolboxes such as MPT 3+
- Experience with the Robot Operating System (ROS)
- Experience working with Autonomous Vehicle (AV) simulators such as Carla, LGSVL and Webots.
- Experience with AV software stacks as Apollo or Autoware.
- Experience with Formal Verification and Testing tools such as Storm, VerifAI, S-Taliro etc.

Instructions for MASc and PhD candidates:

Please see <https://uwaterloo.ca/graduate-studies-postdoctoral-affairs/future-students/programs/electrical-and-computer-engineering-phd-waterloo> for application details, and <https://uwaterloo.ca/research/find-and-manage-funding/apply-funding/building-budget/recommended-salary-rates> for information on salary and benefits.

Once you submit your application, please email yash.pant@uwaterloo.ca with your CV, transcripts (unofficial is fine), and a few lines on how your background and research interests align with ours. *Important:* Use the position code PhD-1-F2022 or MASc-1-F2022 to start the email's subject line.

Instructions for applying to the Postdoctoral fellow position:

Applicants for the Postdoctoral fellow position should contact yash.pant@uwaterloo.ca with their CV, Research Statement, two representative publications, and the contact information for 2-3 references. The position will be for an initial period of 1 year, with the possibility of extending the position for another year (or more). For exceptional candidates, an appointment to the position of Senior Research Associate will be considered, and the duration of the initial appointment is negotiable.

Important: Please use the position code PDF-2022 in your email's subject. I will be taking applications until the position is filled.

See <https://uwaterloo.ca/graduate-studies-postdoctoral-affairs/welcome-postdoctoral-affairs> for more information about Postdoctoral fellow positions at Waterloo.