Join the ADvanced AIRspace Usability (ADAIR) project!

Aviation is rapidly changing: In the next 15 years, the number of air passengers and the number of aircrafts will double compared to their levels in 2017. New flight deck technologies are urgently required to sustain this expected growth. Polytechnique Montreal, McGill University and Ryerson University joined together to design the flight deck of the future. We work in human factors, user-centered design, mixed reality and avionics systems, and you can be part of that team.

We are currently looking for top-minded researchers and students to join our research program and transform the way pilots interact with the cockpit.

Open research positions

- **2 Post-doctoral fellows. Full-time position**. **Salary + benefits of** CAD 60,000/year. **Duration** 3 years.
- **5 PhD students. Scholarship of** CAD 22,500/year. **Minimum duration** 3 years.
- **2 Master's students. Scholarship** of CAD 20,000/year. **Duration** 2 years.

The project will **start in Spring-Fall 2022 for a duration of three years. Graduate applicants will typically be considered for September admissions.**

What you will work on

- Investigate the future tasks of pilots and how technology will change aviation in the next 15 years.
- Design multimodal interactions for the flight deck of the future on one of the following topics: trajectory-based operations (TBO), airport taxi navigation, data management and datalink communication.
- Prototype human-machine interactions on a flight simulator and test your designs with real pilots.
- Publish and present scientific articles to share your findings.
- Post-doctoral fellows will also be responsible for test readiness on the flight simulator, project management, coordination between academic and industrial partners and mentoring of other students.

We planned the project such that you can focus your work on one research topic in a specific interaction domain.

- **Multimodal interactions** will design the user-facing interactions between the pilot and aircraft technologies on head-down formats. It will investigate different interaction modalities, such as visual, tactile, or auditory to improve pilot's task performance, experience and operational safety. **Expected workplan**: 2 PhD students will work on TBO, 2 PhD students will work on data management and communication and 1 PhD student will work on airport taxi navigation.

- **Avionics integration** will study how to implement on avionics software and hardware the interactions developed by the Multimodal team for the topics of TBO and data management. It will study logical and physical architecture for efficient data exchange between avionics functions. **Expected workplan**: 1 Master's student will work on TBO and 1 Master's student will work on data management and datalink communication.
- **Flight deck interactions** will study pilot's interactions in the future airspace and will develop assistive technologies to improve task automation. **Expected workplan**: 2 PhD students will work on this topic.

Why should you join us

- You will join a Master or PhD program where you will learn user-centered design, human factors and avionics.
- Gain research experience in collaboration with industrial partners: You will work with the talented engineering teams of our six partners on human factors, flight deck design and avionics. These companies have already hired several of our graduates following their degrees.
- New to aviation? We will subsidize registration fees for aviation classes to help you obtain your Private Pilot License (PPL).
- Join our teams of graduate students from diverse backgrounds ranging from industrial design to engineering. Spoiler alert: Motivating!

Want to learn more? Get in touch and tell us what interests you in this project. Follow the links to our academic profiles (below) and write us an email. If you'd like to provide your academic transcript, job resume or extracts of your previous research, that would be welcome but is not required at this point.

- **Jeremy Cooperstock**, Electrical and Computer Engineering, McGill University https://www.cim.mcgill.ca/~jer/
- **Philippe Doyon-Poulin**, Industrial Engineering, Polytechnique Montréal https://www.polymtl.ca/expertises/en/doyon-poulin-philippe
- **Joon Chung**, Aerospace Engineering, Ryerson University https://www.ryerson.ca/aerospace/people/faculty/joon-chung/
- **Guchuan Zhu**, Electrical Engineering, Polytechnique Montréal https://www.polymtl.ca/expertises/en/zhu-guchuan