Cognitive ergonomy for unmanned aircraft operations

Job description

The INIT Robots lab is seeking a postdoctoral fellow to lead the research efforts on cognitive load assessment for multi-UAV piloting. Civil aviation (i.e. F.A.A. and Transport Canada) regulations for small unmanned aircraft include the importance for pilots to understand their physiological capacities, such as fatigue and optical illusions and a limited openness to the simultaneous centralized piloting of several aircraft (5) by the same pilot (TC article 901.40-2). In this project you will actively participate in building the knowledge for these regulation bodies, while working on high-end wearable sensors and real professional pilots.

The projects impacted by this work involve the collaboration of several partners, namely MIST Lab directed by Pr. Giovanni Beltrame at Polytechnique Montréal, CL:ASP Lab directed by Pr. Emily Coffey at Concordia University, LIO Lab directed by Pr. Rachid Aissaoui at ÉTS, KOPTR Image flight school and Spiri Robotics. You will work closely with the experts from these groups.

Responsibilities

The successful candidate will carry out the responsibilities of this position with dynamism and creativity, namely

- You will advance knowledge on Human-robot teaming, cognitive load measurements, UAV piloting interface and user-centered design.

- You will publish original research as the first author in journals such as Applied Ergonomics, Autonomous Robot Journal and IEEE Transactions on Human-Robot Interaction.

- You will work with a team of several MScs and PhDs and several engineering interns where you will enhance your supervision and mentoring experience.

- You will lead the close coordination between the researchers from the partners involved in the related projects;

- *Network* with academics and representatives from the aerospace industry.

Resources

We have access to the full range of products by Tobii (pupillometry) and BioPac Systems (ECG, EDA, RSP, etc.) to capture cognitive load-related physiological features. We have strong expertise in UAV simulator in our engineering team and we have access to over 20 aircraft (DJI and Spiri). When ready for real outdoor tests, we can count on the support of KOPTR flight school to provided flight zones and recruit pilots.

Duration

Start date is as soon as possible. The contract is renewable each year for a total duration of two years.

Salary and benefits

You will have a total allowance (salary and benefits) ranging from $50,000 to $65,000 CAD based on experience. This includes:

- Standard workweek of 35h;
- Contribute to a Registered Retirement Savings Plan (RRSP), with the employer matching your contribution up to 5% of your salary;
- Health and medical insurance offered by Manuvie;
- 23 days of vacation and 10 days due to sickness.
- The work mode is hybrid, meaning that you can work remotely at times. You will have to be in Montreal for activities involving user studies, user tests, simulator setup, meetings with partners and supervising students.

Profile and Job Requirements

- You must have completed your PhD less than 5 years ago;
- You hold a PhD in Engineering, Computer science, Ergonomics or Psychology;
- You have practical experience to conduct user-centered design activities: user studies, human-robot interaction prototyping or usability tests;
- You have practical experience in programming Python and/or C++;
- You have published original research in quality journals;
- Having experience with UAV is an asset e.g., pilot license, aerodynamics courses, FPV racing, etc.
- Having experience with the Robotic Operating System (ROS) is an asset.

Application Instructions

Candidates are invited to submit an application file that includes:

- A CV
- A cover letter with a statement of your research interests
- Up to three significant contributions you authored, explaining your role in the work.

To apply: https://initrobots.ca/en/positions
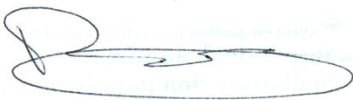
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