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Aerospace Research Centre, Human Factors research team
Re: Research Council Officer, Airborne Research (18610)

Dear Hiring Manager,

I am writing to express my interest in the Research Council Officer role within the Human Factors research team at NRC. I am excited about the opportunity to leverage my optimization and modeling experience to contribute to the cutting-edge technology and innovation being developed at the NRC Aerospace research centre.

I have 6 years of experience doing research on aerospace and aviation related projects. I am currently a post-doctoral research at the department of computer science and operations research (DIRO) at the Université de Montréal as part of an industrial project with the international air transport association (IATA). My current research focuses on temporal graph learning from aviation data collected over the last decade to assess the effectiveness and impact of the IATA operation safety audit (IOSA) on air travel accessibility and cooperation between airlines. I believe this experience is closely related to the research being done by the Human Factors team as it focuses on operational standards in aviation and passenger experience when it comes to codesharing between airlines.

I also worked on various research projects during my tenure at McGill University with aeroengine companies such as GKN Aerospace. I developed mathematical frameworks to facilitate complex engineering design analyses that are common in the industry. For example, engineers wish to understand the sensitivity of their designs with respect to certain decisions and client requirements. This results in changes that propagate through the various systems of the product (e.g., a change in an aircraft's wing could propagate to the fuselage design). I authored a Python library and various web applications to perform said sensitivity and change propagation analysis on an engineering system (defined by the user) and returns various results and visualizations to convey the sensitivity results.

As part of my research at McGill, I had to work with actual aeroengine components on computer-aided design (CAD) and finite element analysis (FEA) software which gave me the necessary exposure to simulation tools that are commonly used in the industry. However, I have a basic understanding of computational fluid dynamics (CFD) software and have used ANSYS Fluent in the past as part of internships and automotive engineering competitions (Baja SAE and solar powered vehicles).

I am confident that my technical abilities, combined with my strong mathematical and simulation skills, would make me a valuable asset to your team. I am eager to bring my expertise to the Human Factors team and am excited about the opportunity to work on challenging projects that require creative and innovative solutions.

Thank you for considering my application. I would be honored to have the opportunity to discuss my qualifications further and show you my portfolio of projects. Please feel free to contact me through any of the channels at the top of this letter.

Best regards,

Khalil Al Handawi