UNIVERSITY OF ALBERTA

DEPARTMENT OF MECHANICAL ENGINEERING

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Research Assistant Position Available – Optimal Tool-path Generation for Repair Technology (Doctoral Student Opportunity)

The Position

Dr. Rafiq Ahmad and Dr. James Hogan of the Department of Mechanical Engineering at the University of Alberta, in collaboration with Industry partners and the Province of Alberta, invites applications and queries for a doctoral (PhD) student position in the area of **optimal tool-path generation method for repair technology**. This position will be open to candidates who possess a Master of Science degree in Mechanical Engineering Mechatronics or relevant engineering field. Applicants with expertise and experience in reverse engineering, system design and integration, advanced additive and subtractive manufacturing, repair or remanufacturing are highly encouraged to apply. The successful candidate will be required to work independently and must communicate well in English. Some national and international travel may be required. The successful candidate will be financially supported. This position is available to Canadian citizens, permanent residents of Canada, and international applicants. It is expected that the successful candidate will take up the position in September 2019. Interested candidates may wish to visit **https://sites.ualberta.ca/~rafiq1/** to learn more about the Laboratory of Intelligent Manufacturing, Design and Automation (LIMDA) and **https://sites.ualberta.ca/~jdhogan/index.html** to learn more about the Centre for Design of Advanced Materials.

The Project

The proposed research project will develop the necessary fundamental understanding of multi-criteria optimization and industrial robot tool-path generation methods. It is expected that, after experimentation on various deposition strategies, integration, testing, and preliminary tool-path modelling in Matlab and Octopuz, the knowledge obtained will provide substantive guidance to academic and industry partners on how to select the best process parameters to enhance the product performance based on multi-criteria optimization. The selected candidate will make fundamental contributions to the tool-path generation, best strategy and process selection for repair technology.

Training and Professional Development Opportunity

The selected candidate will receive formal training in the following practical areas: 1) multi-criteria optimization; 2) image processing; 3) laser deposition path control; 4) programming and tool-path generation using a manipulator robot; 5) tool-path modeling; and 6) the effect of tool-path in material deposition. The successful candidate will have opportunities to participate in national and international conferences, collaborate with at least one national or international expert on the project, and receive exposure to Dr. Ahmad's and Dr. Hogan's expansive professional and industrial network.

The candidate will have access to the partner company's facility and various software for validation. The candidate will also have access to a 5-axis CNC machine, a 3-axis CMM, and the Industrial Robots and Additive Manufacturing facilities available in the LIMDA at the Department of Mechanical Engineering at the University of Alberta.

Application Procedure
Position is now open and applications will be reviewed as they are received until the position is filled. In order to apply, the candidates may email the application package to Dr. Rafiq Ahmad (Rafiq.Ahmad@ualberta.ca). The email subject should contain the job ID. LIMDATPGPHD. The application package should contain a PDF file with the file name in the format LIMDATPGPHD_lastname_firstname.pdf containing the following:

1. A cover letter
2. A detailed academic CV including a minimum of three references (including MSc. supervisor)
3. Copies of degree transcripts
4. 2 copies of relevant journal publications related to the research area
5. A research statement showing your fit with the described areas and a plan for future research

LIMDA is proudly located at the University of Alberta in the heartland of Alberta, Canada. The University of Alberta is a one of the top 100 University's in the world ranking and among the top 5 Canadian Universities. Any further inquiries related to the job and/or the application process may be directed to Dr. Rafiq Ahmad.

Contact Person:
Dr. Rafiq Ahmad, Assistant Professor, University of Alberta
Head of Laboratory of Intelligent Manufacturing, Design and Automation
Email: (Rafiq.Ahmad@ualberta.ca) T: (+1) 780 492-7180 (Note: no inquiries will be entertained by phone)

We thank all applicants for their interest. However, only those individuals selected for an interview will be contacted.

The University of Alberta is committed to an equitable, diverse, and inclusive workforce. We welcome applications from all qualified persons. We encourage women; First Nations, Métis and Inuit; members of visible minority groups; persons with disabilities; persons of any sexual orientation or gender identity and expression; and all those who may contribute to the further diversification of ideas and the University to apply.

Start Date: 01 Sept. 2019.