UNIVERSITY OF ALBERTA

DEPARTMENT OF MECHANICAL ENGINEERING

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Postdoctoral Researcher in Transdisciplinary Engineering Design Processes

The Department of Mechanical Engineering at the University of Alberta has a vacancy for a Postdoctoral Research Fellow in the transdisciplinary research area of "Engineering Design Processes for Engineering Undergraduate/Graduate Education".

Background

Today's engineers need to master complex design spaces and are called upon to work in transdisciplinary teams in order to develop efficient solutions to interdisciplinary problems. Despite this new reality, engineering design curricula remain siloed to the various engineering disciplines and focused on teaching subject specific problem resolution approaches. As a result, engineering students graduating from different disciplines have no common basis from which to think holistically about engineering design processes.

Research Project

The project aims to research, disseminate, and help academics uptake new methods, processes and tools of transdisciplinary engineering design processes for undergraduate and graduate education across the Mechanical, Electrical, Civil, and Chemical Engineering disciplines. These methods and tools will be based on a thorough analyses of existing curricula, teaching practices, education and accreditation requirements, the state of the art industrial practices, and external benchmarking. The research will be backed by literature reviews and contemporary statistical methods based on participation of stakeholders, which will include, but is not limited to, survey development and administration, pilot studies, interviews, data collection and analysis. The deliverables are a transdisciplinary engineering design curriculum suitable for introduction across different disciplines, research publications, and an academic symposium.

This position is an opportunity to look at the transdisciplinary aspects of engineering design at the interface of Chemical, Mechanical, Civil, and Electrical Engineering design. By studying the communality and similarity in the design, creativity, and problem solving aspects across the disciplines, a domain independent pedagogic design education method in design and engineering for undergraduate students will be proposed. The candidate will also be required to advise graduate students assigned to the project on methods and approaches.

The Research Fellow will report to Drs. Ahmed Qureshi and Pierre Mertiny, and will also interact with a supervisory team.

Key tasks

The candidate will be responsible to research, develop, evaluate, and disseminate new transdisciplinary design education methods for undergraduate/graduate teaching in the field of Engineering Design Processes. The outcome of the research project will be in form of development of a transdisciplinary design curriculum as well as research publications in relevant journals.

In addition to the research project, the Research Fellow will assist in the creation of the 'Engineering Design Education Lyceum', whose goal is to advance Engineering Design education and have tangible practical

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impact throughout the Faculty of Engineering. Resources made available through the Vargo Teaching Chair held by Dr. Pierre Mertiny will be used to achieve the following five pillars for this initiative in the context of Engineering Design education: (I) identify and document best teaching practices, (II) create assessment tools to evaluate teaching activity effectiveness, (III) foster a judicious discourse/debate of teaching practices, (IV) develop resources, and (V), most importantly, support instructors in their efforts to improve and innovate cross-curricular Engineering Design and engineering education in general.

Your Profile

We seek a highly motivated researcher with a PhD in areas related to Engineering Design Processes, Design Theory and Methodology, Cognitive Science with knowledge of Design, Creativity and Innovation, or Design Education. The ideal candidate will have experience in survey development and administration, and statistical data analysis as evident from prior research/survey activity. Methodological skills for data mining and network analysis would be an additional asset. The candidate should have the proven capability to publish research results in Engineering Design journals (Research in Engineering Design, Journal of Engineering Design, Design Studies, etc.) and at engineering design conferences (ICED, IDETC, ICDC, Design, etc.). The candidate should be able to work independently as well as in a project team, and have excellent social/communication skills. Fluency in English is a requirement.

Application

Your application should consist of:

1. a cover letter (max. one page A4/letter size), emphasizing the candidate's specific interests, qualifications and motivation to apply for this position;
2. a full Curriculum Vitae, including a list of all courses attended and grades obtained;
3. a project plan outlining the approach for the project execution over 24 months;
4. a short description (max. one page A4/Letter) of the candidate's PhD research;
5. at least two sample journal publications; and
6. three letters of references.
7. A document proving fluency in English, if this is not the candidate's native language.

Applications should be submitted before 20 September 2016 by email to Dr. Ahmed Qureshi (ajquresh@ualberta.ca). For more information about the position, please contact Dr. Ahmed Qureshi at the email above or at +1 780 492 3609.

About University of Alberta

University of Alberta, at Edmonton, AB, Canada, is one of the leading universities in Canada and the world with focus on cutting edge research in engineering, science and technology. The Faculty of Engineering at University of Alberta is among: top 3 most-funded universities in Canada; top 3 in size in Canada; and Top 25 Engineering schools in North America. The university is situated in the heartland of Canadian oil and gas extraction, exploration, and processing industry and is close to many strategic engineering manufacturing industries.