Research Assistant Position Available – Control of Heating Performance of Thermal-sprayed Coatings (towards a Master’s degree)

The Position
Dr. André McDonald and Dr. Hossein Rouhani of the Department of Mechanical Engineering at the University of Alberta invite applications and queries for a research assistant position in the area of Control of Heating Performance of Thermal-sprayed Coatings. This position will be open to a candidate who possesses a Bachelor’s of Science (or Engineering) degree in Mechanical Engineering. Applicants with keen interests and/or experience (coursework, research, and/or industrial) in heat transfer, MATLAB programming, mechanical controls, electronics, mechatronics, thermal spraying, and/or materials science are highly encouraged to apply. The successful candidate will be required to work independently and must communicate well in English. All candidates will be financially supported during the tenure of their program. This position is available to Canadian citizens, permanent residents of Canada, and international students. It is expected that the successful candidate will take up the position in September 2018, and be registered as a student at the University of Alberta. Travel for the purposes of attending meetings and dissemination of results will be required.

The Project
The proposed research project envisages the fabrication of metal and metal matrix composite coatings for heating and temperature control of airfoils. Possible airfoils include, but are not limited to, aircraft wings and wind turbine blades. The project will result in the development of a thermal model for the coating to obtain the surface temperature and energy generated as a function of the applied voltage. A closed-loop feedback controller for active control of the heating and thermal output of the coatings will also be developed. System identification techniques and artificial intelligence will be used to model the coating system and estimate its parameters. The industrial component of the project will revolve around the application of the results in wind turbine blades or other airfoil structures for consultation with corporate stakeholders such as Airbus, Pratt and Whitney, and GE.

Thermal Spraying and Other Training
The training of graduate research assistants is paramount. The selected candidate will receive formal training in the following practical areas: i) surface preparation, ii) high-quality coating deposition, iii) programming and operation of a 20-kg payload robot, iv) operation of an industrial coating deposition system, v) electrical measurement and data acquisition, vi) control system design, and vii) safety. The student will have opportunities to participate in national and international conferences.

Application Procedure
Interested candidates may contact Dr. André McDonald (andre.mcdonald@ualberta.ca) and Dr. Hossein Rouhani (hrouhani@ualberta.ca) to discuss their qualifications and the project. Please visit
https://sites.ualberta.ca/~andre2/ to learn more about the Advanced Heat Transfer and Surface Technologies Laboratory and other open positions.