Call for candidates

Professor in Energy Storage Systems and Electric Propulsion Systems

Nº 06536
Posting period: September 19, 2023 to December 4, 2023

JOB DESCRIPTION: Professor
LOCATION: Main Campus
STATUS: Regular
ADMINISTRATIVE UNIT:
Faculty of Engineering
Electrical and Computer Engineering Department
SCHEDULE: Full time tenure-track position

The Université de Sherbrooke (UdeS) is seeking applications for a position as professor in Energy Storage Systems and Electric Propulsion Systems. This is a full-time tenure track at the Facuty of Engineering, in the Electrical and Computer Engineering Department, or in the Mechanical Engineering Department, depending on the profile of the person hired, at the Faculty of Engineering.

Equity, diversity and inclusion

The Université de Sherbrooke (UdeS) values equity, diversity, equality and inclusion in employment within its community and invites all qualified individuals to apply, particularly women, members of visible and ethnic minorities, Aboriginal peoples and persons with disabilities in compliance with the Quebec Act respecting equal access to employment in public bodies. The screening and assessment tools can be adapted according to the needs of persons with disabilities who request them, and this, in complete confidentiality. The Université de Sherbrooke also encourages people of all sexual orientations and gender identities to apply. Priority will be given to Canadians and permanent residents. Learn more about equity, diversity and inclusion at UdeS.

Research Chair in Transportation Electrification

The selected candidate will be responsible for setting up and directing a research chair supported by the *Centre de technologies avancées BRP – Université de Sherbrooke* (CTA), a leader in the development of advanced technologies in the field of vehicles and mobility. The main objective of this chair will be to contribute to the advancement of knowledge on the various technologies that make up mainly on-board energy storage systems, but also electric propulsion systems, while allowing the training of highly qualified personnel and innovation in this strategic sector.

The CTA-BRP-UdeS is located on the main UdeS campus in the ACELP innovation park. The Chair, which is in line with the themes related to the electrification of transportation, including vehicle-battery integration, thermal management, performance, safety and electric propulsion systems, is accompanied by a contribution from the industrial partner of $100,000 CAD per year for 5 years. This contribution will be used as a match with federal and/or provincial granting agencies (e.g., Natural Sciences and Engineering Research Council of Canada's Alliance program along with an application to the Quebec *Regroupements sectoriels de recherche industrielle*).

About the Faculty of Engineering

The UdeS Faculty of Engineering is a leader in education and applied research. Recognized for its dynamism in collaborative research, it stands out particularly in terms of technology transfer and concrete impacts on society.

It is also a faculty on a human scale, which favours rigorous and complete training of its students, particularly through the alternating study and internship program. In a friendly and highly collaborative environment, discovery and innovation are strongly encouraged.

To foster its long-term growth, the Faculty of Engineering is particularly focused on interdisciplinary initiatives and emerging fields. The Faculty of Engineering has several research centers as well as the Interdisciplinary Institute for Technological Innovation (3IT), a part of the Integrated Innovation Chain along with the Institut quantique (IQ) and the Centre de collaboration MiQro Innovation (C2MI).

Discover all the advantages of a career at the UdeS Faculty of Engineering, in the heart of the Eastern Townships!

About CTA-BRP-UdeS

The CTA-BRP-UdeS brings together professors, students, BRP engineers and research professionals. These work teams develop specialized vehicles and related technologies in electrification, structural lightening, noise management, mechatronics, connectivity and virtual reality. The CTA-BRP-UdeS is dedicated to the engineering of vehicles, their complex systems and components and is one of the few organizations that can work in both applied research and product development (R&D); its university and industrial collaborations give it access to best R&D practices.

Learn more about the CTA-BRP-UdeS

About the Departments

The candidate may be part of one of the following departments depending on their profile.

The faculty members of the Electrical and Computer Engineering Department are active in the fields of classical and quantum embedded systems engineering, autonomous vehicles, robotics, embedded artificial intelligence, neuromorphic systems, instrumentation and digital communications. The Department has seven research chairs and offers master's and doctoral programs that allow students to work in infrastructures that bring together numerous cutting-edge research laboratories under the direction of internationally recognized researchers. The Department's facilities include clean rooms for microfabrication, development and characterization laboratories for integrated circuit packaging, smart antennas and software-defined radio, medical devices, instruments for particle physics, power electronics and electric vehicles, embedded systems and robotics, as well as a platform for the design, development and fabrication of printed electronic circuits, a 1MW solar infrastructure, and a space and immersive audio room. Of the University's six institutes, the Department's faculty members are notably involved at 3IT, IQ and the Research Center on Aging (CDRV).

The faculty members of the Mechanical Engineering Department are active in the fields of audible and ultrasonic acoustics, aeronautics, bioengineering, sports engineering, product design and development, industrial energy efficiency, solar energy, advanced materials, mechatronics, microelectromechanical systems, shock wave physics, robotics, thermofluids engineering and vibrations. The Department has six research chairs and offers master's and doctoral programs that allow students to work in infrastructures that include numerous cutting-edge research laboratories, under the direction of internationally recognized researchers. The Department is distinguished by its facilities, which include coupled anechoic and reverberation chambers, wind tunnels, including an anechoic one, equipment for the characterization of materials and structures, ultrasound scanners, prototyping platforms for controllers, and several of its members are part of the 3IT, a unique infrastructure for micro-fabrication that includes 1,600 square meters of clean rooms, as well as its approach to teaching design and a rich entrepreneurial component, supported by numerous partnerships.

Expertise

The candidate will contribute to the creation of cutting-edge technological solutions for companies involved in the development of tomorrow's vehicles, especially the design of battery systems integrated in electric drivetrains for recreational vehicles. The expertise of CTA-BRP-UdeS includes design, computer-aided design (CAD), testing and predictive engineering (FEA, CFD, MBD, etc.). Prototypes are produced in a virtual reality (VR) studio, in additive manufacturing (3D Printing) or in one of its mechanical and electronic workshops. These laboratories are used to characterize and validate the systems designed through mechanical cycling and electrical testing. The CTA-BRP-UdeS is equipped, among other things, with dynamometers for cells, batteries and complete EV systems including transmission efficiency, as well as a thermal propagation test area and instrumentation for data acquisition, in addition to having access to BRP's various test centers.

The candidate will participate in teaching and conduct fundamental and applied research in the following area(s):

- Primary expertise: on-board energy storage systems (batteries), including the integration and optimization of different components and taking into account safety, thermal management, performance and cost issues.
- Secondary expertise: design and optimization of electric propulsion systems; the objective is to support collaborative research on the main and peripheral components of electric propulsion systems, including motors, control modules, inverters and chargers.

In order to be successful, the successful candidate must have previously conducted research and/or development projects in the area of energy storage systems (ESS) for electric vehicles.

Functions

- Teach at the undergraduate and graduate levels.
- Develop fundamental or applied research activities, particularly in the context of a research chair with CTA-BRP-UdeS.
- Supervise graduate students.
- Participate in university life.
- Contribute to community service.

Requirements

- Hold a doctorate in a relevant discipline
- Have an interest in and aptitude for teaching, university pedagogy and skills development.
- Have an interest in research disciplinary, interdisciplinary, intersectoral partnerships with industrials, innovation and knowledge transfer.
- Be able to plan, organize and develop a project independently.
- Demonstrate an ability to supervise graduate students.
- Have previously published in peer-reviewed journals.
- Demonstrate the ability to establish and maintain good interpersonal relationships, collaboration and teamwork skills.
- Demonstrate leadership qualities, initiative and excellent ability to communicate and interact effectively and smoothly with various internal and external partners.

- Ability to comply with the requirements of responsible research conduct.
- Have the ability to **teach in French** or to achieve this ability within a reasonable time frame.
- Be a member of the *Ordre des ingénieurs du Québec* (OIQ) or have the qualifications to become a member and commit to becoming a member within 5 years.

The working conditions are governed by the collective agreements in force.

Regular, full-time, tenure-track position,

Anticipated start date: October 1, 2023.

Application process

The deadline for submitting applications is **December 4th, 2023.**

Review of applications will begin on October 1rst 2023 and will continue until the deadline and the position is filled.

We invite you to submit your application electronically by clicking on the "Postuler" button.

Please combine the following in one pdf document: (please provide complete files)

1. Your curriculum vitae;
2. A letter of motivation;
3. A proposal for a research chair program (2 pages) describing the problem, objectives, methodological approach, links with your previous work, as well as the training of highly qualified personnel (students, research staff, etc.). The adequacy with the strategic plan of the Université de Sherbrooke and the Faculty of Engineering should also be explained. Funding opportunities (granting agency programs, companies, etc.), as well as the collaborations and networking envisaged should be described;
4. A description of your vision of teaching (2 pages) including the courses to which you could contribute and/or that you would like to develop and the teaching methods that you advocate;
5. A one-page text on equity-diversity-inclusion (EDI) that presents specific actions already taken or planned to promote EDI (i) in the training of new staff (recruitment, mentoring, career development); (ii) in the realization of research projects; and (iii) in the involvement in university life. We invite you to consult the guide to submitting an EDI text (in French). The Faculty is interested in individuals whose research, teaching, and community involvement demonstrate the importance it places on diversity in higher education;
6. Reprints from the most relevant recent contributions (maximum 3).

In addition, please have **three external referees** each send a letter of recommendation directly to the contact information below:

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