Development of a Reconfigurable Integrated Multilevel Inverter

Record number : OPR-1413

Overview

RESEARCH DIRECTION

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ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie électrique et de génie informatique
Institut interdisciplinaire d'innovation technologique (3IT)

LEVEL(S)

3e cycle

LOCATION(S)

Campus principal
3IT - Institut interdisciplinaire d'innovation technologique

Project Description

The research project consists of designing, manufacturing, and experimentally validating a novel integrated inverter concept for the next generation of electric propulsion systems in the automotive industry. The work includes a review of the latest state-of-the-art inverter technologies and topologies, optimization of the inverter based on a driving cycle and a multi-speed transmission, the complete detailed design of the inverter and its subsystems, electrical and thermal simulations, manufacturing, and experimental validation. The objective is to increase the converter's efficiency and power density while reducing its cost, thereby making electric vehicles more accessible to consumers. This multidisciplinary project involves several significant technical challenges, and its outcomes will contribute to the development of commercial products for the electric propulsion systems of tomorrow. The project is carried out in collaboration with another master's student and a research professional in electrical engineering.

Work Environment: The student will be part of the Createk Innovation Group at the University of Sherbrooke. With 12 faculty members, 12 staff members, and more than 75 graduate students from a variety of disciplines, all passionate about technological innovation, Createk offers a work environment focused on technology development. Its mission is to support innovation by fostering strong connections between research and industry. The group also maintains a vibrant maker community, providing access to a wide range of prototyping equipment through its FabLab workshop. In addition, Createk promotes an entrepreneurial mindset through various events held throughout the year.On a day-to-day basis, the student will work with the Dana TM4 Research Chair team, which includes six other graduate students and two research professionals, while also benefiting from the support of Dana TM4's Advanced Engineering team. The work will be conducted in the state-of-the-art facilities of the Interdisciplinary Institute for Technological Innovation (3IT). Université de Sherbrooke Createk Innovation Group Dana TM4 Research Chair Interdisciplinary Institute for Technological Innovation (3IT)

Discipline(s) by

Funding offered

Yes

Partner(s)

Dana TM4

$ 35 000 annual

sector

Sciences naturelles et génie

Génie électrique et génie électronique

The last update was on 22 June 2026. The University reserves the right to modify its projects without notice.