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Undergraduate Research Program	
Project Name	Thermal behaviour of batteries under vibration excitations
Campus & Location in Mexico	Monterrey
Faculty	Engineering
Research Area	Automotive Consortium for Cyber-Physical Systems
Research Responsible	Sanatiago Daniel Puma Araujo
Description of the Project	The performance of batteries in electric vehicles is affected by the vibrations generated by the car's movement. It is proposed to study the vertical vibration on a battery installed within the vehicle chassis and quantify their effects on battery heating and consequent impact for the cooling solution.
Training Provided	Academic manuscript development;Analysis of scientific articles;Scientific-based problem solving
Modality	Hybrid
Offered During	Summer (5 weeks);Winter (5 weeks);Semester

Student	
Tasks/Responsibilities	<p>Develop state of art research on batteries.</p> <p>Implement a multiphysics model using the following modules:</p> <p>Solid mechanics to model the vibrations of the battery and the power dissipation.</p> <p>Battery design to assess the power dissipation on the battery due to the charge/discharge cycles.</p> <p>Heat transfer to study the dynamic evolution of battery temperature.</p> <p>Single-phase flow to evaluate the cooling capability of the battery pack thermal management system.</p> <p>Match the performance of the multiphysics model with experimental data available from literature.</p> <p>Document the activity.</p>
Required Language Proficiency	English (Advanced)

Required Skills and Abilities	Mechanical Vibrations, heat transfer, electrical circuits.
Other Documents Required to APPLY for an Internship	<ol style="list-style-type: none"> 1) Being at least in your 2nd year of bachelor 2) Accumulative grade point average (GPA) 2.5 3) Official Transcript 4) 2 letters of recommendation of faculty members 5) Resume 6) Letter of intention explaining the reason why you would like to participate in the research program