Custom Code Development for Brushless Motor Control in Legged Robots

Context:
The EPFL Xplore Research Pole has the objective of building a legged robot. The robot is designed to autonomously navigate through challenging terrain using its on-board sensors.

Project description:
The semester project aims to develop custom code for accurate speed and position control of a brushless direct drive motor in legged robots. Initially using the Motheus controller PCB and code, the project seeks to deepen understanding by creating a custom solution with field-orienting control. The scope includes integration with CAN-bus and ROS for comprehensive control of the motor.
Furthermore, the student will be an integral part of the Xplore Legged Robot Team, actively participating in its weekly meetings and working sessions. This collaboration will facilitate close interaction with other team members, and the student is expected to share their findings and progress with the team regularly.

Tasks:
The project involves a series of tasks, outlined below (note that this list is not exhaustive):
- Motheus Controller Analysis.
- Custom Code Development.
- CAN-bus Integration
- ROS Integration and Finalization

Expected Outcomes:
- In-depth understanding of the Motheus controller and its code.
- Proficiency in developing custom code for field-orienting control of brushless direct drive motors.
- Successful integration of the custom code with CAN-bus communication.
- Successful integration of the custom code with ROS for enhanced robotic system functionality.
- Clear documentation and explanation on the different choices.

Contact:

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