Project Proposal: **Gesture Motor Controller System using KL25Z**.

Submitted by - ***Jayash Arun Raulkar***

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1. Project Functionality:

The proposed project aims to create a controlled motor system that allows users to control the movement of a robot or similar device using the KL25Z development board. This system will incorporate a three-axial inertial **MMA sensor using the I2C** protocol to detect orientation changes. I know using an onboard sensor is not allowed but I'll make it interesting by making it communicate with **an other board**. The KL25Z will **collect sensor data** and transmit it via **UART to a second control board**, which will be responsible for driving motors. Users will be able to control the direction and speed of the motors by tilting and moving the KL25Z, effectively steering the robot.

2. Technologies:

For this project, I plan to use and demonstrate expertise in the following technologies, building upon the knowledge gained in the course assignments:

I2C: Utilize the I2C protocol to communicate with the three-axial inertial MMA sensor.
UART: Implement UART communication to send sensor data from the KL25Z to the secondary control board.
GPIO Lines: Use GPIO pins for connecting and controlling motors.
Interrupts: Employ interrupts to respond to user input, ensuring real-time motor control.
State Machines: Implement state machines to manage the system's various operating states.
Configuration of the **System Clock**: Configure system clock settings for accurate sensor data processing.
KL25Z Reference Manual: Refer to the KL25Z Reference Manual for hardware-specific details and setup.

3. Learning and Research:

To accomplish this project, I anticipate needing to learn about integrating sensor using the I2C protocol and designing a robust UART-based communication protocol. I will consult online resources, sensor datasheets, and the KL25Z Reference Manual to gather the necessary knowledge and implementation details. I will if needed work with others to perform peer code reviews or otherwise support others as well.

4. Hardware Requirements:

The hardware setup for this project will involve the following components:

KL25Z development board (main control unit).
Three-axial inertial **MMA** sensor (external to the KL25Z).
Secondary control board with motor drivers and motor control components. (i have not yet decided the second board)
Motors and associated hardware for motor control. (Something like L293D)
I will assemble these components as per project requirements, ensuring a functional and stable hardware configuration.

5. Testing Strategy:

My testing strategy will combine automated and manual testing methods to ensure the system's functionality and reliability. I will perform tests to verify sensor data collection and UART communication. Manual tests will involve user interaction to assess the real-time motor control as the KL25Z is moved.

Testing scenarios will include typical usage, edge cases, and error scenarios to validate the project's correctness and robustness.

This proposal outlines my intention to create a Gesture controlled motor system using the KL25Z development board,underlining my understanding of the project guidelines, especially the restriction on using onboard sensors, but i will aim to create a captivating project by using external sensors and inter-board communication(UART communication), demonstrating my mastery of embedded software technologies.