IMU Sensor Data Collection Report

KANIKI BHIKSHAPATHI - 24489

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Sampling Rate

Based on the experiments with the IMU sensor, we were able to achieve a sampling rate of approximately 2-3 samples per second. This rate allows us to capture a fair amount of data to analyze movements but may not be sufficient for high-speed dynamics.

Potential Improvements

To increase the sampling rate, several adjustments can be made:

1. **Code Optimization:** Minimizing the processing within the main loop, such as reducing serial communication or complex calculations.
2. **Hardware Capabilities:** Using a microcontroller with higher processing capabilities might allow quicker data handling and storage.
3. **Buffering Mechanisms:** Implementing more efficient data buffering techniques could help in handling data more quickly.

Challenges Encountered

- **Mobility of Equipment:** Carrying both the board and a laptop during active data collection phases proved cumbersome. This limits the scope of activities that can be comfortably recorded.
- **Data Accuracy:** Ensuring the accuracy and consistency of data while the subject is in motion is challenging due to potential shifts in the sensor's position.

Proposed Solutions

- **Wireless Connectivity:** Integrating wireless modules, such as WiFi or Bluetooth, could enable remote data logging, thus enhancing the portability and ease of use of the system. This would allow the user to move freely without the need for carrying a connected device.

Observations

- **Environmental Factors:** Environmental factors like temperature and mechanical shocks could affect the sensor readings, highlighting the need for calibration and error handling in real-world applications.
- **Practical Application:** Real-world applications could benefit from enhanced data collection methods, like integrating multiple sensors to corroborate data and improve accuracy.