

Implementation of Secure Coding Practices in IoT Accelerometer Boundary Detection System

In this code, several secure coding aspects have been applied to enhance reliability, robustness, and security. Here are the key aspects:

1. Input Validation:

- The code validates accelerometer readings obtained from the IMU sensor to ensure they are not NaN (Not a Number), which could indicate a sensor malfunction or invalid data. This prevents potential issues caused by using invalid data for calculations.

2. Error Handling:

- The code includes error handling mechanisms to deal with failures during the initialization of the IMU sensor and when reading accelerometer data. If the sensor initialization or data reading fails, the code provides error messages and takes appropriate actions, such as retrying initialization or halting execution.

3. Resource Management:

- The code manages system resources effectively by using the `millis()` function to track time intervals for data logging, preventing resource exhaustion or timing issues.

4. Secure Communication:

- The code establishes secure communication with the host device through the Serial interface. While this code does not transmit sensitive data, ensuring that the Serial connection is properly initialized and used for debugging purposes only helps maintain a secure communication channel.

5. Boundary Checking:

- The code performs boundary checking to detect when the accelerometer readings exceed predefined threshold values, indicating a boundary-crossing event. This helps identify when the device moves outside the specified boundaries.

6. Code Comments:

- The code includes comments that improve code readability and maintainability. Clear and concise comments help developers understand the purpose of each code section, making it easier to identify potential security risks and vulnerabilities.

Overall, these secure coding aspects contribute to the reliability, robustness, and security of the code, ensuring it functions correctly and securely in various scenarios.

Link to GitHub: <https://github.com/Bhumika-Chauhan09/redback-orion>

