**12. RISKS AND MITIGATION**

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| Risk | Description | Mitigation Strategy |
| Sensor Malfunction or Inaccuracy | Inconsistent readings due to lighting, surface reflectivity, or hardware issues | 1. Regular calibration under varying conditions. 2. Use redundant sensors or sensor fusion. 3. Implement error-handling in code. |
| Power Supply Issues | Battery drain or voltage drops causing system failure | 1. Monitor battery voltage in real time. 2. Optimize power usage in code - Keep spare batteries on hand. |
| Software Bugs and Instability | Unexpected behaviour due to bugs or incomplete testing | 1. Modular programming with good documentation. 2. Conduct unit and integration tests. 3. Use version control. |
| Hardware Damage | Mechanical failure or wear and tear from testing | 1. Use durable materials and proper mounting. 2. Regular physical inspection. 3. Keep spare parts available. |
| Environmental Variability | Performance drops in outdoor or non-lab settings | 1. Test in diverse environments early. 2. Use adaptive thresholds and calibration techniques. |
| Team Coordination and Time Constraints | Delays from poor communication or uneven workload | 1. Hold regular team meetings. 2. Use project management tools (e.g., Trello, GitHub, MS-PM). 3. Allocate buffer time for issues. |