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SOFTWARE REQUIREMENTS SPECIFICATION (SRS)

Project Title: Autonomous Agribot System

AIM: Design and develop an autonomous agribot to automate agricultural operations such as tilling, sowing, irrigation, and crop monitoring using embedded systems, wireless communication, and intelligent control.

1. Introduction

1.1 Purpose: This document specifies the functional and non-functional requirements of the Autonomous Agribot system. The system aims to reduce manual agricultural labor and improve efficiency through automation.

1.2 Scope: The agribot supports autonomous navigation, soil preparation, precision sowing, micro−irrigation, crop monitoring, and remote supervision.

1.3 Overview: The system integrates embedded controllers, sensors, wireless communication, and intelligent decision-making to perform farming tasks autonomously.

2. General Description

2.1 Functions:

- Autonomous navigation
- Tilling and ploughing
- Precision seed sowing
- Soil moisture-based irrigation
- Crop and field monitoring

2.2 User Community:

- Farmers

- Agricultural technicians
- System administrators

3. Functional Requirements

3.1 Possible Outcomes:

- Successful field navigation
- Accurate seed placement
- Controlled irrigation
- Real-time monitoring feedback

3.2 Ranked Order of Requirements:

- Navigation and mobility
- Soil preparation
- Sowing mechanism
- Irrigation control
- Monitoring and alerts

3.3 Input-Output Relationship:

Input: Sensor data, field parameters, control commands Output: Actuator control signals, status updates, alerts

4. User Interface Requirements

4.1 Software Interfaces:

- Web or mobile monitoring interface
- Wireless communication dashboard

4.2 Examples:

- Live status display
- Sensor data visualization
- Alert notifications

5. Performance Requirements

- Response time for control actions: < 2 seconds
- Support continuous operation in field conditions
- Handle multiple sensor inputs simultaneously

6. Non-Functional Attributes

6.1 Usability: Easy-to-operate monitoring interface

6.2 Reliability: Stable operation in outdoor environments

6.3 Security: Secure wireless communication between modules

7. Schedule and Budget

Requirement Analysis
– 1 week
Design – 2 weeks
Development – 4
weeks
Testing – 1 week

Budget estimation depends on hardware and deployment scale.

8. Conclusion

The Autonomous Agribot system provides a reliable and intelligent solution for automating agricultural activities, reducing human effort and improving productivity.