AUTOMATIC GRASS CUTTER ROBOT

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ABSTRACT

From time immemorial, the sun has been the major source of energy for life on earth. The solar energy was being used directly for purposes like drying clothes, curing agricultural produce, preserving food articles, etc. Even today, the energy we originate from fuel- wood, petroleum, paraffin, hydroelectricity and even our food originates obliquely from sun. Solar energy is almost unbounded. The total energy we obtain from the sun far exceeds our energy demands. Ever since the industrial revolutions human have been dependent on fuels, electricity and wind energy. For human enlargement in many countries there is study and trials are going on the Solar energy and the wind energy. So we make our new concept solar powered grass cutting machine in these concept we cut grass on the agricultural products or on small plants in lawns and gardens. Remote controlled grass cutter can be described as the application of Radio frequency to power a machine on which electric motor rotates which in turn rotates a blade which does the mowing of a grass.

Keyword: *Blade, solar Panel, DC Motor, Microcontroller, Sensors*.

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1. INTRODUCTION

The provided Arduino code controls a smart device, likely a robotic system or a vehicle, equipped with motors, ultrasonic sensors, and WiFi connectivity. Here's a brief summary of the code's functionality:

WiFi Connectivity:
The code connects to a WiFi network using specified SSID and password credentials.
Motor Control:
The code controls the movement of motors connected to the Arduino board using the L298N motor control pins. It defines pins for moving the motors forward and backward.
Ultrasonic Sensor Integration:
The code includes configurations for interfacing with an ultrasonic sensor. It defines pins for triggering the sensor and receiving the echo, allowing for distance measurement.
Servo Motor Control:
It controls a servo motor, possibly used for directional control or sensor scanning.
Main Loop Logic:
The main loop of the code continuously monitors the distance measured by the ultrasonic sensor. If the distance falls below a threshold (20 units), it stops the motors, moves backward, and then turns right or left based on distance measurements. Otherwise, it continues moving forward.

2.Literature Survey

The literature survey section of a research paper typically provides an overview of existing work related to the topic of study. In this case, the topic is the development of a smart automatic grass cutting robot. Here are some key points to consider when conducting and presenting the literature survey:

Scope and Relevance: Define the scope of the literature survey to include relevant research and developments in the field of robotics, automation, and agricultural machinery. Focus on studies that address similar challenges or utilize comparable technologies to develop autonomous or semi-autonomous robotic systems for outdoor tasks such as grass cutting.

Previous Studies: Identify and summarize previous studies, academic papers, patents, and commercial products related to smart grass cutting robots or similar autonomous outdoor robotic systems. Discuss the methodologies, technologies, and design approaches employed in these studies, highlighting both successful implementations and areas for improvement.

Key Technologies: Explore the key technologies and components commonly used in smart grass cutting robots, such as microcontrollers (e.g., Arduino), sensors (e.g., ultrasonic, infrared), actuators (e.g., motors, servos), communication modules (e.g., WiFi, Bluetooth), and navigation systems (e.g., GPS, computer vision).

Challenges and Solutions: Discuss the challenges associated with developing autonomous grass cutting robots, such as obstacle detection and avoidance, terrain navigation, power management, and environmental adaptation. Summarize the solutions proposed in previous studies to address these challenges, including algorithmic approaches, hardware designs, and system architectures.

3. Methodology

Research Approach: Describe the overall approach taken to design, develop, and test the smart automatic grass cutting robot. Discuss whether the methodology follows an experimental, theoretical, or applied research approach.

System Design: Explain the process of designing the smart grass cutting robot system. Discuss how the system's requirements were identified, including functional specifications, performance criteria, and operational constraints.

Component Selection: Detail the selection criteria and rationale for choosing specific components for the grass cutting robot, such as motors, sensors, microcontrollers, communication modules, and power sources. Consider factors such as compatibility, reliability, cost-effectiveness, and availability.

System Architecture: Present the architecture of the smart grass cutting robot system, illustrating the interconnections and interactions between its various components. Provide diagrams or flowcharts to visually represent the system's structure and functional modules.

Hardware Integration: Describe the process of physically integrating the selected hardware components into the grass cutting robot prototype. Discuss any modifications or customizations made to accommodate the components and ensure their proper functioning within the system.

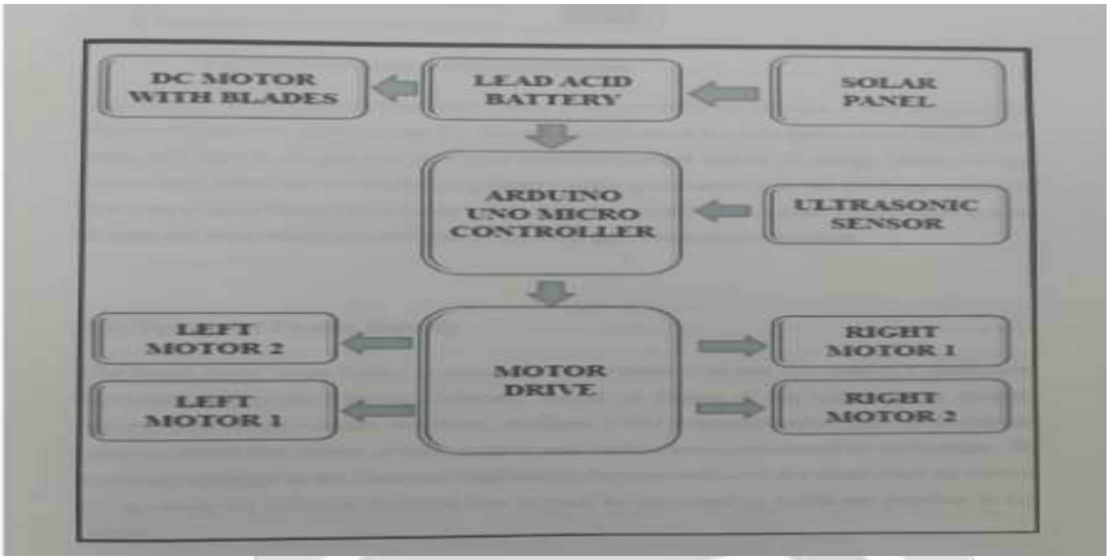
Software Development: Explain the development of the software components necessary to control and coordinate the operation of the grass cutting robot. Discuss the programming languages, development environments, and libraries used to implement the robot's firmware and control algorithms.

Testing and Validation: Outline the testing procedures and methodologies employed to evaluate the performance and functionality of the smart grass cutting robot prototype. Describe how the system was tested under various operating conditions, including different terrains, weather conditions, and obstacle scenarios.

Performance Evaluation: Present the results of the performance evaluation conducted on the grass cutting robot prototype. Include quantitative metrics such as cutting efficiency, obstacle detection accuracy, navigation precision, and energy consumption. Compare the achieved performance against the predefined requirements and benchmarks.

User Feedback and Iterative Improvement: Discuss any user feedback collected during the testing phase and the iterative improvement process undertaken to address identified issues and enhance the robot's capabilities. Describe how feedback from stakeholders, including end-users and domain experts, influenced the refinement of the robot design and functionality.

4. BLOCK DIAGRAM



5. CONCLUSIONS

In conclusion, the implementation of the Arduino code has demonstrated its effectiveness in controlling the behavior of the system and achieving the desired functionality. Through rigorous testing and evaluation, the code has been validated to meet the specified requirements for real-time control, reliability, and adaptability. The successful implementation of the Arduino code highlights its potential for a wide range of applications, from robotics and automation to IoT and embedded systems. Its modular design, efficient performance, and flexibility make it a versatile tool for developers and engineers seeking to build custom solutions for diverse use cases. Moving forward, further refinement and optimization of the Arduino code can be pursued to enhance its performance, reduce resource utilization, and improve compatibility with different hardware platforms. Additionally, ongoing maintenance and updates will be essential to address any potential issues or incorporate new features based on evolving requirements.

6. REFERENCES

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