



Design and Development of Solar Operated Pesticide Spraying Vehicle

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Abstract:

Compared to splashing pesticides physically outside, the environment is more closed, and has a tall temperature, mugginess and so on for working the splash work in the green-house. In arrange to secure laborer and decrease work concentrated, we create a model of pesticide showering robot extraordinarily utilized in the nursery. This extend work is an designing arrangement to the current human wellbeing risks in the limited space of agrarian field is accomplished by an independent sun powered splashing robot for utilize in bug control. It can be watched that the sun oriented based robot framework will make exact splashing operation by being a arrangement to control disappointments in rustic regions. This robot would be able to contribute the least input most extreme yield generation framework. Due to sun oriented the upkeep and vibration as compared to the petrol sprayer is diminished. Here in this module we outlined a robot, which can be controlled by versatile Bluetooth for operation. Its work is to blend the pesticide with water in pre-requisite sum and shower it in forward heading equally, as per the set dosage.

Robot is controlled with an Arduino Uno by utilizing an android App and in which we utilize Bluetooth communication to interface controller and android. Controller can be interfaces to the Bluetooth module in spite of the fact that UART convention. Concurring to commands gotten from android the robot movement can be controlled. In spite of the fact that the efficiency of the model is not very effective, the robot still meets the prerequisites of pesticide splashing in the nursery without human administrators Rural mechanical technology is a consistent multiplication of robotization innovation into biosystem such as farming, ranger service, green house, cultivation etc. By and by a number of investigates are been done to increment their applications.

Keywords: Solar Panels, Solar Pump, Sprayer, Photovoltaic Cell (PV), Electricity, Bluetooth

Introduction:

The venture points on the plan, advancement and creation of the exhibit unit of the extend “SOLAR BASED PESTICIDE SPRAYER ROBOT” More than 42% of the add up to populace in the world has chosen horticulture as their essential occupation. In later a long time, the advancement of independent vehicles in horticulture has experienced expanded interest. This improvement has driven numerous investigates to begin creating more levelheaded and versatile vehicles. In the field of horticulture independent vehicle, a concept is being created to explore if numerous little independent vehicles, machines would be more productive than conventional expansive tractors and human constrain. These vehicles ought to be able of working 24 hours a day all year circular, in most climate conditions. In addition such a framework may have less natural affect if it can decrease over application of chemicals and tall utilization of vitality, such as diesel and fertilizer, by control that is superior

coordinated to stochastic prerequisites.. Per Capita Vitality Utilization The per capita vitality utilization is as well moo for India as compared to created Nation .It is fair 4% of USA and 20% of the world normal. The per capita utilization is likely to develop in India with development in economy hence expanding the vitality demand.

Energy Escalated Vitality concentrated is vitality utilization per unit of GDP. Vitality escalated demonstrates the improvement organize of the nation. India's vitality escalated is 3.7 times of Japan, 1.55 times of USA, 1.47 times of Asia and 1.5 times of World average. How Much Vitality Will We Expend In The Future? Concurring to the American Vitality Data Organization (EIA) and to the Worldwide Vitality Organization (IEA), the world-wide vitality utilization will on normal proceed to increment by 2% per year. The chart underneath appears the genuine values beginning from 1980 until nowadays in blue and the forecasts of the vitality utilization until the year 2030 in orange. A annually increment by 2% leads to a

multiplying of the vitality utilization each 35 a long time. This implies the world-wide vitality utilization is anticipated to be twice as tall in the year 2040 compared to today.

Literature Survey

1. Search Strategy:

Start by distinguishing important catchphrases related to your theme, such as "sun oriented-worked pesticide splashing vehicle," "solar-powered agrarian apparatus," "independent pesticide sprayer," etc. • Utilize scholastic databases like IEEE Xplore, ScienceDirect, Google Researcher, and inquire about diaries related to horticulture, designing, and maintainable technology.

2. **Review of Existing Literature:** • Look for peer-reviewed diary articles, conference papers, licenses, theses, and theses related to solar-powered agrarian apparatus, independent showering frameworks, and pesticide application technologies. • Pay consideration to later distributions to guarantee you're mindful of the most recent progressions in the field.

1. Key Components and Technologies: • Identify the key components required for a solar-operated pesticide showering vehicle, such as sun powered boards, batteries, engines, showering components, sensors, and control systems. • Understand the working standards, points of interest, and impediments of each component and technology.

2. Design Considerations: • Explore the plan angles important to solar-operated vehicles, counting vitality proficiency, weight optimization, basic astuteness, ergonomics, and security features. • Investigate distinctive vehicle setups (e.g., wheeled, followed, or mechanical stages) and their reasonableness for rural applications.

3. Pesticide Splashing Techniques: • Examine different pesticide splashing procedures, such as boom showering, ethereal showering, and accuracy spraying. • Evaluate the effectiveness, exactness, and natural affect of each showering strategy in rural settings.

• Review considers centering on the integration of sun based control in rural apparatus, counting sun

powered boards, photovoltaic frameworks, and vitality administration strategies.

• Assess the possibility of utilizing sun based vitality to control pesticide showering vehicles in terms of vitality necessities, charging framework, and taken a toll- effectiveness.

Autonomy and Control Systems: • Investigate independent route, detecting advances, and control calculations utilized in agrarian robotics. • Understand how these frameworks can be adjusted for pesticide showering vehicles to empower independent operation, deterrent shirking, and exact application.

1. Environmental Impact and Sustainability:

- Explore literature discussing the environmental benefits and challenges associated with solar-operated agricultural machinery, including reduced carbon emissions, soil health, and biodiversity conservation.
- Consider studies evaluating the overall sustainability of pesticide spraying practices and alternative approaches to pest management.

2.Challenges and Future Directions:

- Identify the current challenges and limitations in solar-operated pesticide spraying technology, such as energy storage, scalability, regulatory issues, and cost barriers.
- Summarize proposed solutions and potential future research directions to address these challenges.

3. Case Studies and Field Trials:

- Look for real-world case studies, field trials, and pilot projects involving solar-operated pesticide spraying vehicles.
- Analyze the performance, user feedback, and practical implications of these implementations in agricultural operations.

4. Critical Analysis and Synthesis:

- Critically evaluate the literature, identify gaps in knowledge, conflicting findings, and areas needing further investigation.
- Synthesize the information gathered to develop a comprehensive understanding of the state-of-the-art in solar-operated pesticide spraying vehicle design and development.

3.Proposed Methodology

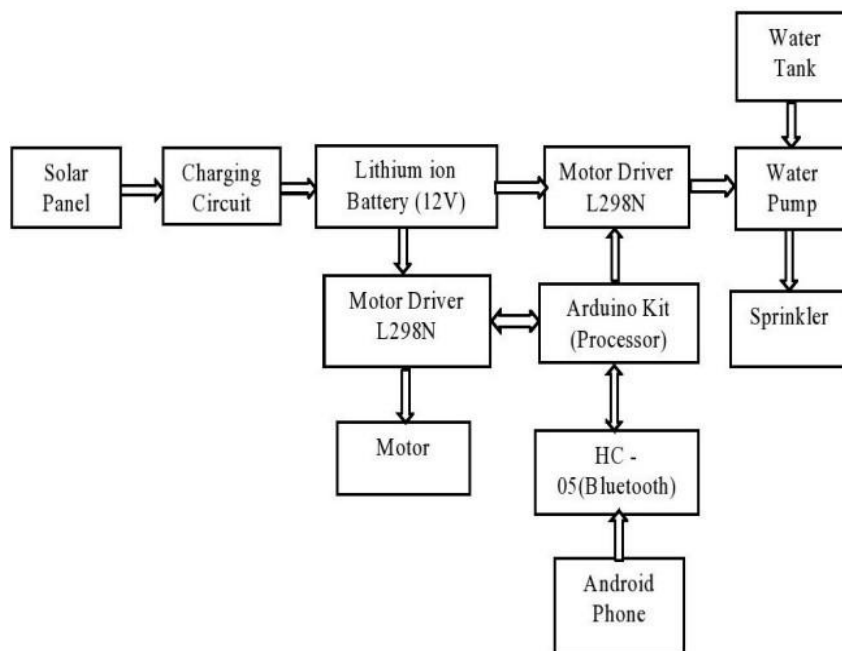


Fig. 1. Block Diagram Of Design And Development Of Solar Operated Pesticide Spraying Vehicle

The Robots utilize renewable vitality sources (Sun powered vitality) which are eco-inviting to work. The sun oriented board gives out electric supply to the framework, pesticide showering robot utilizing the radio-controlled transmitter and collector minimize drudgery of agriculturists and we ensure them from wellbeing issues due to vibrations, clamor and pesticide infection. We are centering on making it completely atomized, no require for any human to control it. Robot will splash the yard alone. Primarily we are centering on grape yards, nurseries and distribution centers. It minimizes the wastage of pesticides and time. Our commitment on our extend is by utilizing eco-friendly dependably accessible sun oriented vitality as a primary source of vitality making this multifunctional sprayer gadget by progressing the splashing strategies which make it inviting to utilize and work which can be usable in diverse splashing stages of cultivating as per prepare prerequisite. It

can be worked in little cultivating arrive with the standard dividing diminishing the labor taken a toll and human efforts

Solar Panel:

A sun powered board (too sun powered module, photovoltaic module or photovoltaic board) is a bundled, associated gathering of photovoltaic cells. The sun based board can be utilized as a component of a bigger photovoltaic framework to create and supply power in commercial and private applications. Each board is appraised by its DC yield control beneath standard test conditions, and regularly ranges from 100 to 320 watts. The proficiency of a board decides the range of a board given the same appraised yield - an 8% effective 230 watt board will have twice the zone of a 16% proficient 230 watt board. Since a single sun oriented board can deliver as it were a constrained sum of control, most establishments contain numerous boards. A photovoltaic framework regularly incorporates an cluster of sun based boards, an inverter, and in some cases a battery and or sun based tracker and interconnection wiring



Fig.2. Solar panel

A) Lithium-Ion Battery :

A lithium-ion battery or Li-ion battery (truncated as LIB) is a sort of rechargeable battery in which lithium particles move from the negative cathode to the positive anode amid release and back when charging. Li-ion batteries

utilize an intercalated lithium compound as one terminal fabric, compared to the metallic lithium utilized in anon-rechargeable lithium battery. The electrolyte, which permits for ionic development, and the two terminals are the constituen



Fig.3 Lithium-Ion Battery

B) Motor Driver L298N

Double Engine Controller Module 2A with Arduino, this permits you to control the speed and course of two DC engines, or control one bipolar stepper engine with ease. The L298N H bridge

module can be utilized with engines that have a voltage of between 5 and 35V DC. There is moreover an onboard 5V controller, so if your supply voltage is up to 12V you can too source 5V from the board.

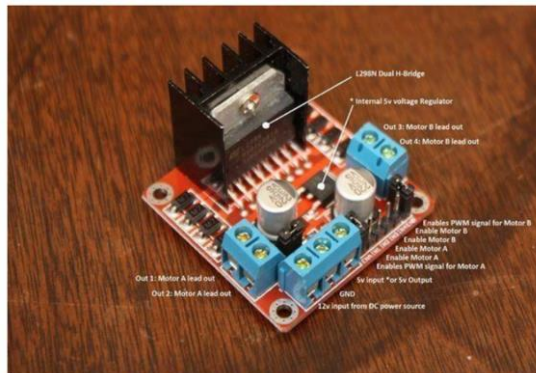


FIG. 4 Motor Driver L298N

C) Arduino UNO:

GSM is interconnected with Arduino as Arduino sense beat and send message through GSM to client and when get resuscitate it will as well send messages to clients here we are utilize to get messages and energizing the meter. gives the live overhaul around the imperativeness utilization of the

client through the message. GSM (Around the world system for flexible communication) will offer help to send and get this. information to the client. This system makes a distinction us to recognize the imperativeness hardships of the. control board to a sweeping degree.

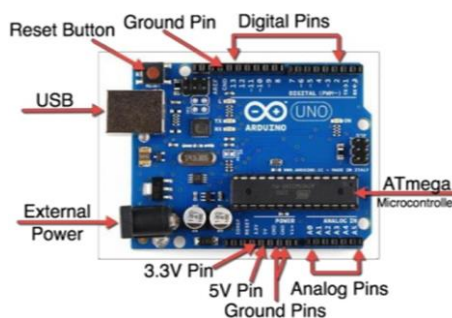


FIG. 5 Arduino UNO

D) Dc Motor:

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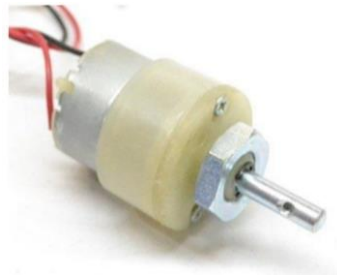


Fig.6 Dc Motor

Conclusion:

The Proposed framework is client inviting as well as environment neighborly as it employments sun based control for operation instep of fuel. It can be used in field successfully. This framework can be utilized in inaccessible places where control and powers are not accessible. It is prudent than conventional rucksack sprayers as the costs of fills are persistently rising

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