

SOLAR TRACKING SYSTEM

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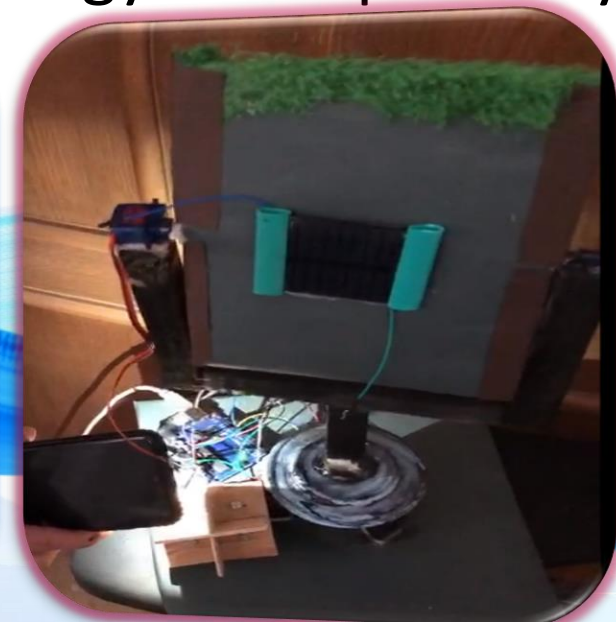
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Dual Axis Solar Tracking System

- A dual axis solar tracking system is a sophisticated mechanism designed to optimize the orientation of solar panels throughout the day to maximize energy capture.
- Unlike fixed or single-axis systems, dual-axis trackers can adjust both the azimuth (horizontal angle) and the elevation (vertical angle) of the solar panels.
- This system is particularly effective in maximizing solar energy absorption by following the sun's path across the sky.





★ Advantages of Dual Axis Solar Tracking Systems

- 1) Increased Energy Production
- 2) Better Performance in Low Light Conditions
- 3) Maximized ROI
- 4) Space Optimization

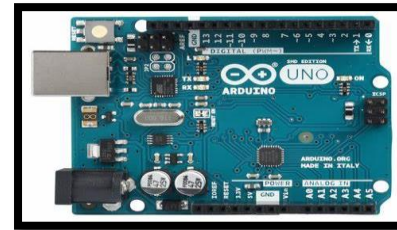
★ Usefulness of Dual Axis Solar Tracking Systems

- 1) Commercial and Utility-Scale Projects:
- 2) Rural and Off-Grid Applications:
- 3) Research and Development:

★ Idea of Making a Dual Axis Solar Tracking System

• Components Required:

- 1) **Solar Panels:** Photovoltaic panels to convert solar energy into electrical energy.
- 2) **Microcontroller:** To control the motors and ensure accurate tracking (e.g., Arduino).
- 3) **Sensors:** Light sensors (e.g., LDRs) to detect the sun's position.
- 4) **Motors:** Servo motors or stepper motors for precise movement.
- 5) **Mounting Structure:** A robust structure to hold the panels and motors.
- 6) **Power Supply:** Batteries, Arduino wire or other power sources to run the system.
- 7) **Software:** Programming logic to control the tracking algorithm.



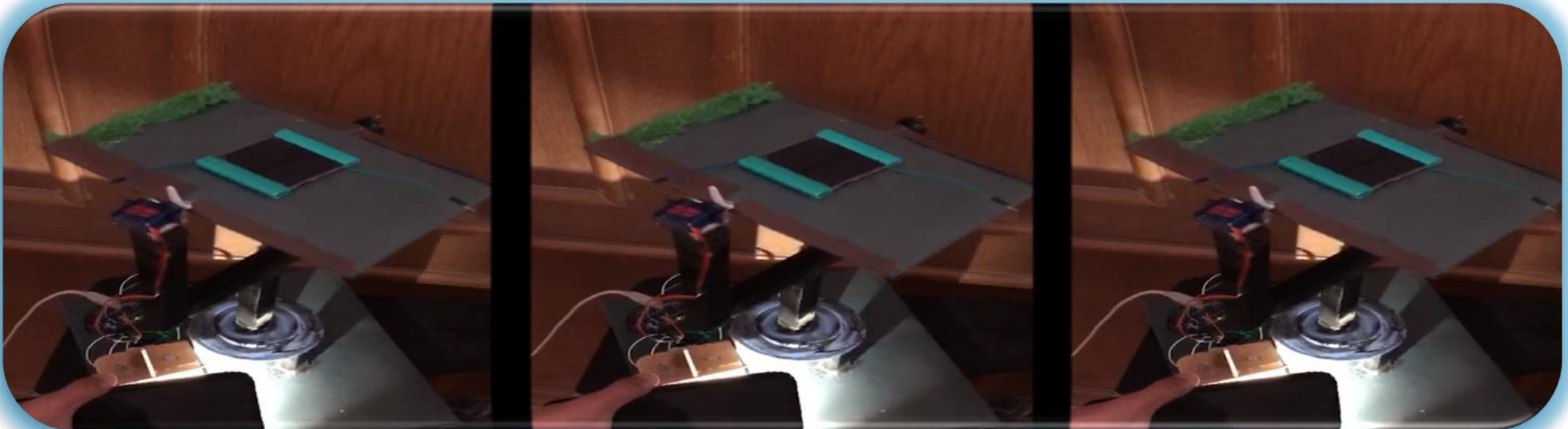


★ Construction Steps:

- 1) **Design the Mounting Structure:** Build a frame that can securely hold the solar panels and allow movement in both axes.
- 2) **Install Motors:** Attach the motors to the frame for controlling the tilt and rotation.
- 3) **Sensor Placement:** Place light sensors strategically around the panels to detect the sun's position.
- 4) **Microcontroller Setup:** Program the microcontroller to process sensor data and control the motors accordingly.
- 5) **Integration and Testing:** Assemble all components, integrate the system, and test it under various conditions to ensure proper functionality.

★ Benefits and Utilization

- 1) Energy Optimization
- 2) Cost Efficiency in the Long Term
- 3) Environmental Impact
- 4) Scalability



★ Conclusion

- Dual axis solar tracking systems represent a significant advancement in solar energy technology.
- Their ability to maximize solar energy capture makes them an attractive option for various applications, from residential to large-scale solar farms.
- Despite the higher initial costs, the long-term benefits in terms of efficiency, energy yield, and environmental impact make them a worthwhile investment.
- Embracing dual axis tracking technology can play a crucial role in advancing sustainable energy solutions and optimizing the use of solar power.