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TITLE : IOT BASED SOLAR SKATING CYCLE

SUBTITLE : SKATE SMART

Presented by

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Outline of the Presentation

1. Introduction
2. Background
3. Methodology
4. Data and Analysis
5. Results and Conclusion

Introduction

- **Motivation**
- Environment pollution is the foremost issue Indian face today. Pollution is also caused by vehicles.
- Vehicles also face different issues like Traffic problems, increased fuel costs, investment problems, size, parking problems etc. Considering all the above problems solar Powered Electric Smart Skate Scooter is the best solution for a short distance travel.
- Usage of solar renewable energy sources in scooters reduces the pollution. Small size of the scooter reduces the traffics and it also helps elderly people to travel short distance.
- While considering the different aspects like Traffic problems, increased fuel costs, investment problems, size, parking problems etc, for all those problems we have a best solution of 'Solar Powerd Small sized vechile'.

- The Electric Skate Board is a modern-day innovation which is completely rechargeable and has a battery backup of 2-3 hours in one single use.
- The size of this skate board is small as compared to any commercial vehicle on the road.
- As the size is small it solves our first problem of parking space.
- It can be effortlessly used on roads, college campus, large scale as well as small scale industries as a medium of transport.
- This E-skate board has a capacity and capability to travel a short distance of 2-3km, with a battery backup of 2-3hrs.
- Due to its small size which is handy in nature it can easily pass-through traffic jams, by saving one's time.
- This effort of using electric skate board is contributing to environment by not causing pollution in air.
- A successfully working eco-friendly E-skate board was implemented.



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Background

History

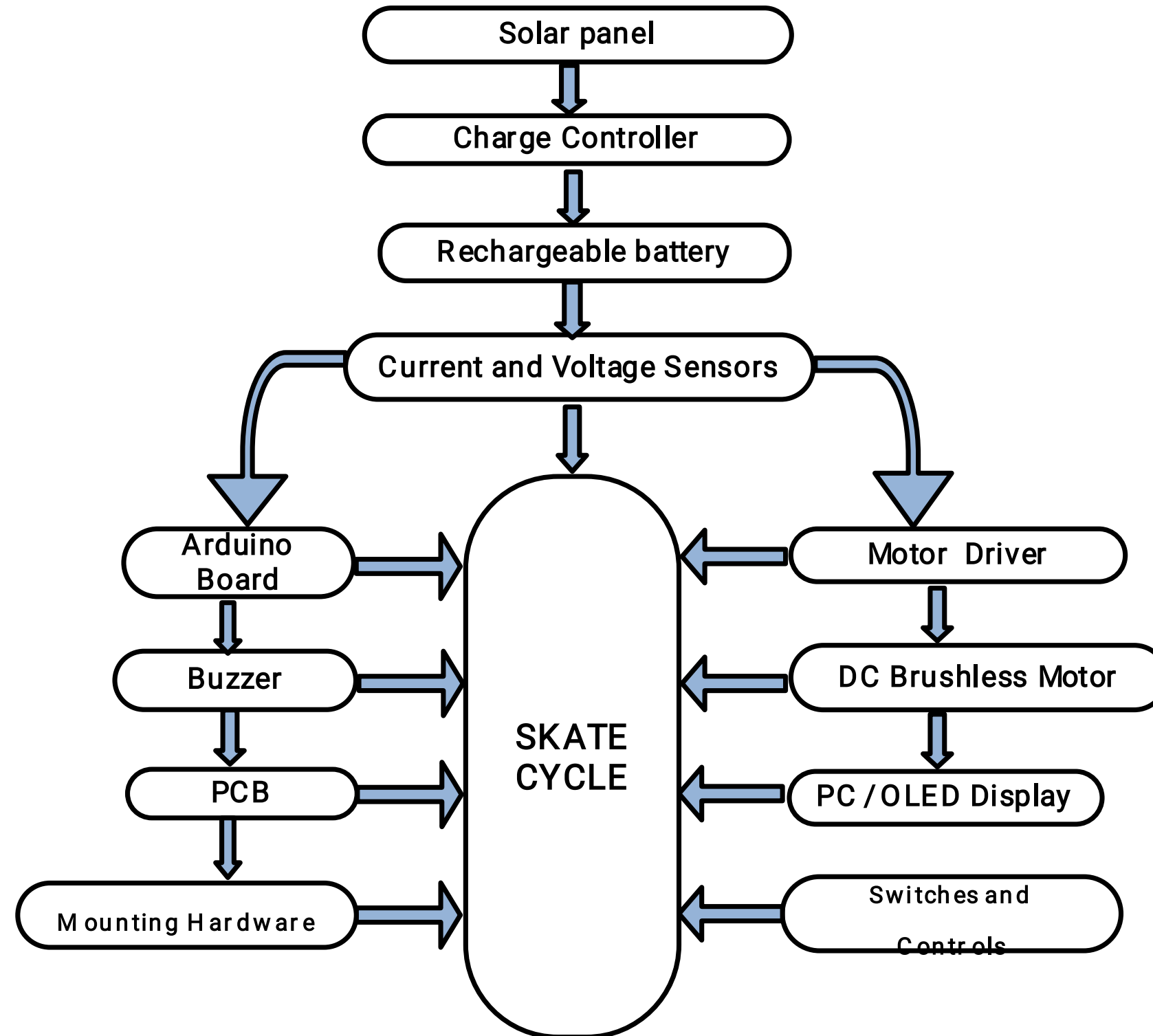
- 1. 1970s: First solar-powered vehicles (experimental cars).
- 2. 1980s: Solar-powered bicycles and tricycles.
- 3. 2000s: Solar-powered skateboards and skate cycles.
- 4. 2010s: Advancements in solar panel efficiency and battery technology.

L i t e r a t u r e R e v i e w

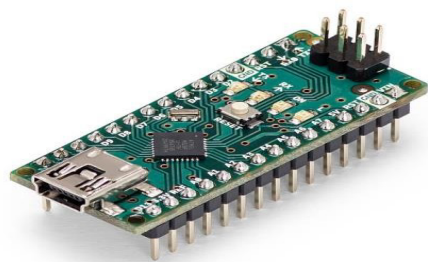
- "Solar-Powered Electric Vehicles" (Journal of Solar Energy Engineering)
- "Design and Development of Solar-Powered Skateboard" (International Journal of Mechanical Engineering)
- "Energy Efficiency Analysis of Solar-Powered Bicycles" (Journal of Transportation Engineering)
- "Solar-Powered Transportation: A Review" (Renewable and Sustainable Energy Reviews)

Methodology

- Solar Panel: Select appropriate solar panels based on the power requirement of the system.
- Charge Controller: The solar panels will charge a battery that powers the motors and Arduino, allowing continuous operation during low sunlight conditions. Design a charging circuit to regulate the energy from the solar panels into the battery.
- Switches and Controls: A switch or button to turn the system on/off.
- Motor Driver: H-bridge motor driver or an electronic speed controller [ESC] to control the speed and direction.
- Arduino Board: It controls the motor and other components.



Hardware Components that are used:



Arduino Nano



Skating cycle



Solar Panel



Solar Charge Controller



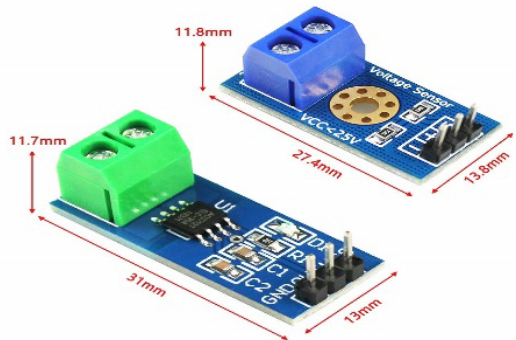
Rechargeable Battery



DC Brushless Motor



Motor Driver



Current and
voltage sensor



Buzzer



Switches and controls

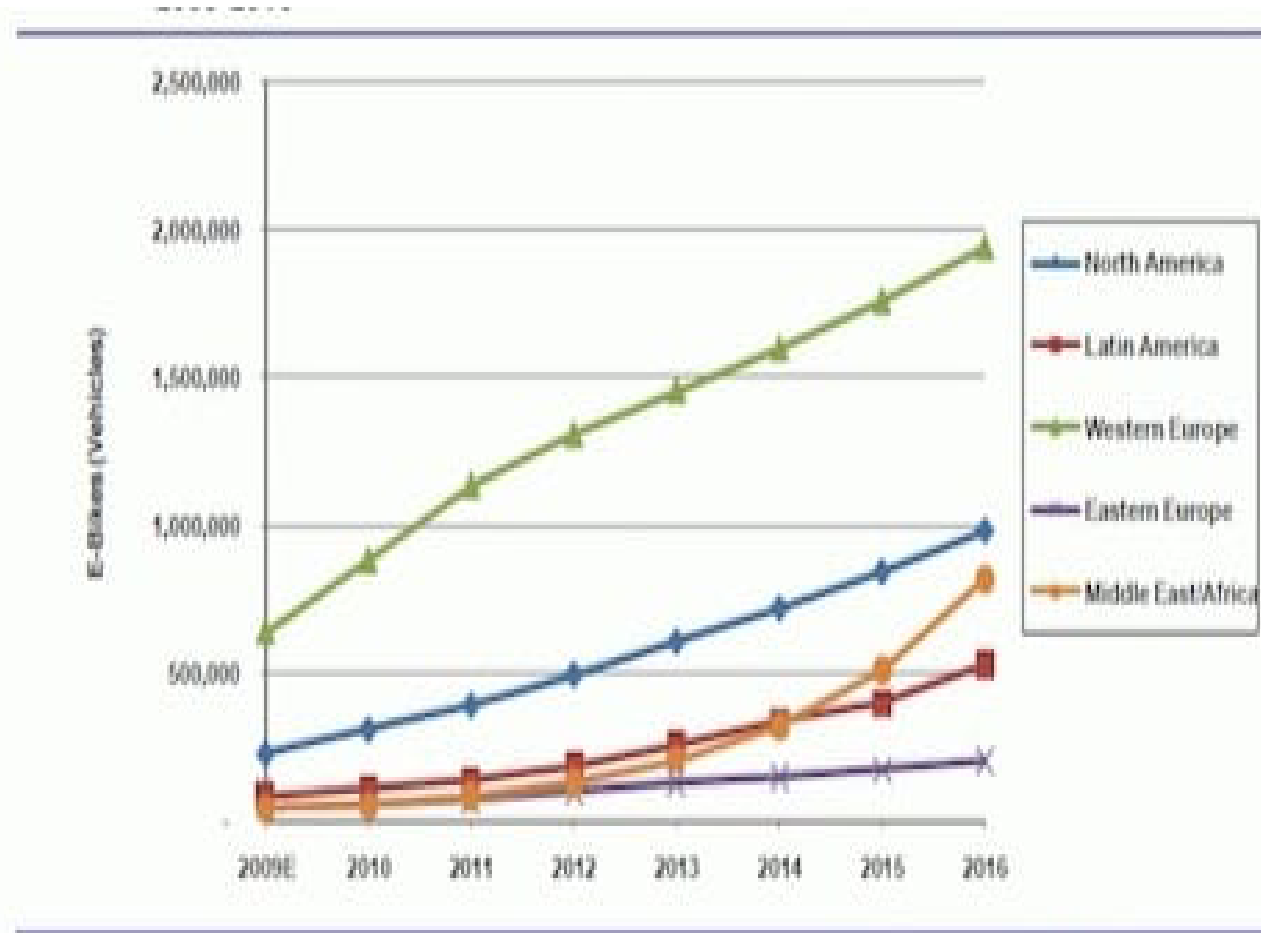


LCD Display



Mounting hardware

Data and Analysis



- Data analysis plays a very important or crucial role in solar skating cycle ,it shows how its gorwing day by day and it also predict the future scope.
- **Manufacturer Specifications:** Data from producers regarding performance and features.
- **User Surveys:** Collecting data directly from users to gauge satisfaction and performance.
- **Field Studies:** Research conducted in real-world settings to test performance under various conditions

Market Trends

- **Adoption Rates:** How quickly solar skating cycles are being adopted in different regions.
- **Technological Advances:** Innovations in solar technology that could improve efficiency or reduce
- **Regulatory Support:** Government policies promoting solar transportation solutions.

Data Analysis Techniques

- **Descriptive Statistics:** Summarize the collected data (mean, median, standard deviation).
- **Correlation Analysis:** Identify relationships between solar output and factors like weather conditions
- **Time Series Analysis:** Analyze energy production and consumption trends over time.
- **Efficiency Calculation:** Calculate the efficiency ratio (energy output vs. energy consumed).

Conclusion

- **Summary**

The solar-powered skating cycle using Arduino is a innovative, eco-friendly, and cost-effective transportation solution. The project demonstrates the successful integration of solar energy harvesting, energy storage, and motor control using Arduino.

1. Eco-friendly transportation
2. Recreational activities (e.g., parks, beaches)
3. Short-distance commuting
4. Environmental education and awareness
5. Research and development in renewable energy and transportation

Future scope

1. Improved Efficiency: Enhance solar panel efficiency, motor control, and gearbox optimization.
- 2. Advanced Materials: Integrate lightweight, durable materials (e.g., carbon fiber, graphene).
- 3. Smart Features: Develop GPS, Bluetooth, and Wi-Fi connectivity for real-time tracking and monitoring.
- 4. Safety Enhancements: Implement advanced braking systems, collision detection, and protective gear.
- 5. Mass Production: Scale up manufacturing to reduce costs and increase availability.

Thank You

Reference S

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2. Chien-Ching Su and Kaohsiung Hsien “Solar Skateboard” U.S patent U S20070272465A1, Nov. 29, 2007
3. Joerg D. Weigl , Low Wen Bin , Ayush Kumar Pachariwala and Luo Yi1 “Multifunctional.
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