

Air Purifying System with the Help of Solar Powered System

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Abstract

Air pollution has become one of the major environmental issues affecting human health and surrounding ecosystems. The proposed Air Purifying System with the Help of Solar Powered System uses solar energy as the primary power source for operating air purification components. The system includes air quality sensors, filters, solar panel, battery, and exhaust fan. The developed system helps reduce harmful gases and dust particles effectively while supporting eco-friendly and energy-efficient operation.

Index Terms

Air Pollution, Arduino Nano, Dust Sensor, MQ135 Sensor, Renewable Energy, Solar Energy, Smart Air Filter.

I. INTRODUCTION

Air pollution is increasing rapidly due to industrialization, urbanization, and vehicle emissions. Polluted air contains harmful gases and dust particles that affect human health. Traditional air purifiers consume large electrical energy. Therefore, renewable energy sources such as solar energy are used to operate air purification systems efficiently. The proposed system uses solar power to drive air filters and monitoring sensors for sustainable environmental protection.

II. OBJECTIVES OF THE PROJECT

1. To develop an eco-friendly air purification system.
2. To utilize solar energy for operating the purifier.
3. To monitor harmful gases using sensors.
4. To reduce dust particles and smoke from air.
5. To provide low-cost and energy-efficient operation.

III. SYSTEM COMPONENTS

- A. Solar Panel
- B. Arduino Nano
- C. MQ135 Sensor
- D. Dust Sensor
- E. Air Filter
- F. Exhaust Fan
- G. LCD Display
- H. Rechargeable Battery

IV. WORKING PRINCIPLE

The solar panel converts sunlight into electrical energy and charges the battery. The Arduino Nano controls the entire system operation. Sensors continuously monitor the air quality. When pollution levels increase, the fan pulls polluted air through the filter chamber and purified air is released into the environment.

V. ADVANTAGES

1. Uses renewable solar energy.
2. Low power consumption.
3. Eco-friendly operation.
4. Portable and low maintenance.
5. Improves air quality effectively.

VI. APPLICATIONS

1. Homes
2. Hospitals
3. Schools and colleges
4. Industries
5. Offices
6. Smart city projects

VII. CONCLUSION

The Air Purifying System with the Help of Solar Powered System provides an effective solution for reducing air pollution using renewable solar energy. The developed system successfully monitors and purifies polluted air with low energy consumption and eco-friendly operation.

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