

عنوان مقاله:

Enhancement of Accessibility and Sustainability: A Smart Solar-Powered Outdoor Laundry Drying System

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خلاصه مقاله:

Assistive Technology (AT) is designed to aid elderly individuals and those with disabilities in overcoming tasks that may pose challenges or be inaccessible without support. Despite substantial research and innovation dedicated to the advancement of AT, opportunities for further improvement persist in this domain. This study aims to enhance existing technology by proposing an innovative, efficient, and environmentally friendly outdoor laundry garment hanging and retrieval system. The proposed system employs the OMRON CPM1A PLC system as the central controller for the motorized mechanism, offering a straightforward yet intelligent approach. The prototype harnesses solar power to operate the automated clothesline system, contributing to energy and carbon emissions reduction, and promoting energy efficiency and cost-effectiveness, hence improving sustainability. The prototype allows both manual and automatic modes for controlling the DC motor's actions in extending or retracting the scissor-like cloth hanger. In manual mode, a push-button switch governs the cloth hanger's movement, while automatic mode relies on input signals from rain and temperature sensors to dictate its behavior. The DC motor will operate to extend the hanger (for drying) whenever the rain sensor detects no water droplets, or, the light sensor detects more than 150 lux, or, the temperature is greater than 24.5. Otherwise, the motor will move to retract the hanger back into its original position when these criteria are the opposites. This proposed solution not only reduces physical strain for elderly and disabled users during laundry drying but also contributes to their enhanced well-being, accessibility, and improved quality of life.

کلمات کلیدی:

assistive technology, accessibility, Smart Home, laundry drying system, solar PV, PLC

