Solar-Powered Robot For Persistent Monitoring Applications

Tech ID: 34689 / UC Case 2026-653-0

BRIEF DESCRIPTION

An autonomous, solar-powered robot designed to travel along suspended wires for long-term, non-invasive environmental monitoring in hard-to-reach natural areas.

FULL DESCRIPTION

This autonomous, bio-inspired robot integrates wire-based locomotion, solar energy harvesting, environmental sensing, and AI-driven energy management into a compact platform for long-term monitoring. A built-in solar-tracking system enables continuous operation without human maintenance, while features such as a self-locking mechanism and low-power “Torpor mode” ensure stability and resilience in harsh outdoor conditions. Designed to operate discreetly in sensitive ecosystems, it collects microclimate data with minimal environmental impact and supports future upgrades for modularity and user-friendly data access.

SUGGESTED USES

» Long-term, low-impact environmental monitoring in hard-to-reach ecosystems such as forests, coastal cliffs, and conservation areas.

» High-quality microclimate and ecological data collection to support climate research, biodiversity studies, and conservation efforts.

» Smart IoT-enabled sensing and education platforms for real-time environmental analytics and STEM outreach.

ADVANTAGES

» Continuous autonomous operation enabled by solar tracking, intelligent energy management, and low-power Torpor mode.

» Has stability and reliability through a bio-inspired design and fail-safe self-locking mechanism that withstands wind and disturbances.

» Combines mobility, sensing, power, and connectivity in a modular, easy-to-deploy system for sensitive environments.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

» **Computer**
» Software
» **Energy**
» Solar
» **Imaging**
» Remote Sensing
» **Sensors & Instrumentation**
» Environmental Sensors
» **Engineering**
» Robotics and Automation

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