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Inventors

Tyler Smith

Sami Mian

Kevin Westgard

Glenn Pace

John Patterson

Contact

Physical Sciences Team

Low-Cost Auto-Aligning Charging Station for Autonomous Drones

Background

Drone charging systems contend with such drawbacks as high cost, tight required landing area, and mechanical complexity. Many involve advanced drone alignment mechanisms or charging pads. Therefore, a charging system that addresses these issues can advance the use of drones in new, autonomous applications.

Invention Description

Researchers at Arizona State University have developed a new charging system for autonomous drones. The design features dual V-channels that allow a drone's weight to guide skid-based landing gears toward charging electrodes. This affords a wide margin of error in landing position with minimal mechanical complexity. Additionally, battery charging accommodates both landing orientations. With emphasis on robust, intervention-free applications, this design allows water drainage while protecting the internal electronics that support battery monitoring and wireless connectivity to the drone.

Potential Applications

- Drone charging stations

Benefits and Advantages

- Dual V-channel design permits wide error margin during drone landing
- Constructed with low-cost, commercial off-the-shelf components
- Robust, weather-proof design allows water drainage
- Charging process does not require human intervention
- Highly adaptable to existing designs with skid-based landing gears

