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Mobile Apps II

Week 8 Summaries

Article 1: Dust-repellent solar panels could save billions of gallons of water

Solar panels have been heavily implemented in recent years to provide energy to power large- or small-scale structures. As such many of the large-scale solar parks are found in deserts, which provide year-round sunlight and large amounts of space. Keeping these panels clean so that the efficiency does not deteriorate, comes with a challenge when the desert dust covers the panels. The ways to clean the panels means a large pure water footprint or the risk of using dry brushes which can cause damage to the glass. To combat the usage of so much clean water, an MIT mechanical engineering scientist Kripa Varanasi and his graduate student came up with a contactless method to prevent dust buildup. The technique uses an electrostatic repulsion force by utilizing a metal bar with electric force and a transparent film with opposite charge. Humidity also plays an important role in giving a charge to the dust particles with the absorbed water. The prototype of this device has so far only worked on dust particles of 30 to 40 microns and further research will be done to extend the method to work efficiently for particles as small as 10 microns.

Article 2: BirdBot is energy-efficient thanks to nature as a model

Alexander Badri-Spröwitz at the Max Planck Institute for Intelligent Systems and his student Badri-Spröwitz have created a robotic design to implement the movement and structure of robust legs, one of that of the ostrich. Ostriches can run up to 55 km/hr and can stay standing for a long time without getting tired, and it is by design an efficient structure that humans do not exactly have. The idea of BirdBot developed and a design was created to copy the movement and the structure of the ostrich legs. When the robot was put on a treadmill, the movement of the legs and the feet are like that of the bird. The design is more quick, robust, and energy efficient than its predecessors. This is credited to the structure of BirdBot which has no motor in its feet but utilizes a spring and cable mechanism that is coupled to the rest of the legs with a series of cables and pulleys. The robot also does not require motor power to stand upright unlike the earlier prototypes. The innovation of this design can mean a larger scale structure that can carry robots with the weight of several tons.

Bibliography

@misc{varanasi_2022, title={Dust-repellent solar panels could save billions of gallons of water}, url={<https://www.popsci.com/environment/dust-repellent-solar-panel/?amp>}, journal={Popular Science}, author={Varanasi, Anuradha}, year={2022}, month={Mar}, abstract={ This discovery is important because as solar panels become increasingly implemented in our society, it also means we need a way to maintain them without using up large volumes of precious water. It is interesting because a simple technique of electrostatic repulsion can be the key to saving billions of gallons of water every year for panel cleaning.}}

@misc{max planck institute for intelligent systems_2022, title={Birdbot is energy-efficient thanks to nature as a model}, url={<https://www.sciencedaily.com/releases/2022/03/220316145744.htm>}, journal={ScienceDaily}, author={Max Planck Institute for Intelligent Systems}, year={2022}, month={Mar}, abstract={ This article is interesting because many animals have features that make them better at running, flying or other characteristics and to see a bird feature being incorporated into a robot could open a new world of robotics. It is important any feature that can reduce energy input, while contributing to a greater overall system is a beneficial discovery in the robotics field}}