

How smart solar tracking system is based on mechatronics design approach?

This paper proposes the conception and development of smart solar tracking system, based on mechatronics design approach, such that the solar panel through both day and seasonal changes is accurately perpendicular to sunlight beam (accurately point towards sun), where illumination is strongest.

What are Intelligent Mechatronic Systems?

The next stage in the evolution of computer controlled systems are the intelligent mechatronic systems, which combine the power of computer control with software for incorporating intelligence through artificial/computational intelligence techniques [5-6].

Is Mechatronics a sub-discipline of mechatronics?

Mechatronics is a modern, interdisciplinary field comprising mechanical systems, electronics, and computers, and has attracted much attention over the past decade [3-4]. Mechatronic systems are mechanical systems controlled by computer software with electronics hardware. In a sense, robotics may be considered a sub-discipline of mechatronics.

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Why is mechatronics education important?

In addition to advancement of education and training in the frontier area of green energy, the focus on mechatronics education can also lead to new technologies and business ventures, training in unstructured problem solving and engineering design, and involvement of engineering and technology students in community service and outreach.

What is mechatronics & robotics?

Thus, mechatronics (and robotics, as special cases of mechatronics) has become a major frontier of engineering and technology, with wide-ranging applications in a variety of disciplines.

Get the cost of the solar cells down to where electricity produced with silicon is comparable to the cost of electricity generated by ...

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Mechatronics, which synergizes mechanical systems, electronics, control engineering, and computer science, is revolutionizing renewable energy technologies" efficiency, performance, ...

Many solar energy systems directly generate electricity from light (e.g., photovoltaic), but incorporate extensive use of electronics and computer control for efficient power conversion, regulation, and storage.

In this work, a mechatronic solar tracker used for increasing the efficiency of the PV systems is approached in the modern trend of concurrent engineering, the study being focused on the optimal ...

Mechatronic systems are created to fulfil basic needs of technology, industry and society. Their significance has been expressed as follows: Virtually every newly designed engineering product is a mechatronic system . Mechatronic systems are ...

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(DOI: 10.1109/inmic60434.2023.10465984) This paper presents a novel solar tracking system that employs mechatronics and photovoltaic engineering to enhance the efficiency of solar power systems. Sun trackers play a vital role in optimizing the real photovoltaic production in the field. However, several challenges need to be addressed during the different phases of the ...

A solar-powered water purification system consists of a solar collector that absorbs sunlight to ensure vaporisation, which is the first stage of purifying and a filter that removes contaminants ...

Reference [6] highlights control systems as the most important element in mechatronic systems in projects beyond the scope a traditional classroom course, and similar ideas are presented by [7] in the context of certain relevant areas on which the global society should focus. In both cases, authors direct * Accepted 27 August 2018. Solar Tracking System: An Educational Tool to ...

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Though one of the older technologies utilizing a renewable resource, mechatronics engineers have made solar power more efficient and accessible. One of the biggest issues with utilizing solar energy is maintaining an efficient conversion rate of incoming sun to energy output without prohibitive costs.

In this graduation project, we seek to improve the solar system efficiency by designing and implementing an automatic solar tracking systems which will keep the solar panel aligned with the sun in order to maximize solar power ...

Get the cost of the solar cells down to where electricity produced with silicon is comparable to the cost of electricity generated by fossil fuel. And, in fact, the industry is getting there. The current estimates are that solar power is costing about the same as peak demand consumer power, \$.23/kWh.

Mechatronic systems are typically those that can respond and react to the external environment on their own. They are sometimes expensive to manufacture and purchase, and the complex array of parts can lead to failures. The availability of mechatronics jobs is on the rise in many places, as of the early 21st century. Employment in the field usually requires ...

Mechatronics system is a combination of different fields and engineering practices due to its vast spreader applications including [10]; ... generation of electrical energy by a solar power plant equipped with a solar tracking system using the . J. Res. Technol. Eng. 5 (4), 2024, 203-217 JRTE©2024 207 ASHRAE clear-sky method for calculating solar insolation. The MathCad ...

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