Sunflower

Systems systems.

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Abstract

The main objective of the Sunflower project is to design a solar tracker to maximize the production of electrical energy from solar panels. A base structure is made which contains two servomotors manipulated through electronic components such as photoresistors (LDR), this makes that depending on the position of the Sun (N, S, E or W) the solar panel is directed to the correct angle to capture solar energy effectively. The innovation part of our project is to link it to the Internet of Things (IoT) and check in real time the solar position through the AppInventor2 application, which sends data to firebase. With solar cells in 4 directions (north, south, east, and west), to view real-time position data through the application designed in AppInventor 2 and this sends the data to firebase. The solar panels are exposed to sunlight, the angle at which the rays reach the surface of the solar panel is directly proportional to the amount of energy generated. This angle is known as the angle of incidence and is a very important factor to consider and determines how well the solar plate converts radiation into electricity.

Introduction

Sustainable energy with guaranteed productivity, Sunflower is a technological innovation project applying IoT. Analyzing the favorable conditions for the installation of solar panels in our country. This project allows the labeling of solar panels to better capture solar energy, has other measurement variables such as temperature and humidity; the end user can review the information in real time through their mobile device. The consumption of electricity, as the Mexican population grows, will become much more expensive in a few years, then as a proposal not as a solution, but as an alternative, we could have our power given by an alternative energy, and since many of the companies that are dedicated to the area of solar panels, usually place the solar panels at a position of 35 degrees. Being an optimal position, but, this way could be more efficient, if the solar panel itself is following the position of the sun, thus giving an added efficiency of perhaps almost 100% of the panel's capabilities by using the sun's energy and converting it into electrical energy.

Materials and methods

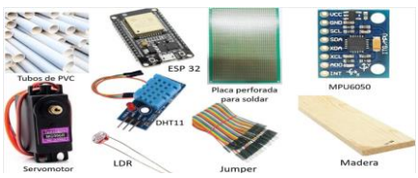

Figure 1 Materials used

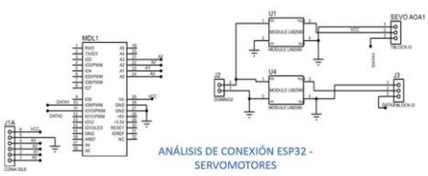

Figure 2 Connection analysis ESP32 – Servomotors

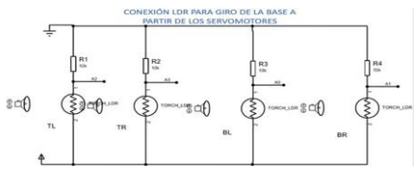

Figure 3 LDR connection for rotating the structure

Results

The Sunflower project met the objectives set, however its physical structure was only to scale, the servomotors were able to make the turns to track the base with the LDRs. The servomotors were able to make the turns to track the base with the LDRs, as for the programming and data collection sections with respect to the sensors, and collect their information and send the data to the firebase also included the variables of temperature and humidity, all this could be displayed in a timely manner through the use of an Android mobile device. It was possible to reach the objective which was to collect and send data to the firebase to be able to visualize them in the application.

Figure 4 Finished project

Figure 5 AppInventor2 Interface

Figure 6 Data sent to firebase

Conclusions

Based on the needs and environmental problems, Sunflower's team created this project with the purpose of guaranteeing efficiency in the installation of solar panels. with the purpose of guaranteeing the efficiency in the installation of solar panels, as we know when working with solar cells we are generating clean energy, making Sunflower a sustainable project with profitability. All the proposed objectives were achieved in which we applied each of the knowledge and skills acquired in the mechatronics engineering career at the Mayan World University, we are proud to conclude one more project successfully, and above all that is sustainable.

Acknowledgments

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Future of research

Sunflower's vision is to make people aware of the importance of clean energy, as a team we have decided to take the project to a larger scale where it can power a home, a business, or a building and be monetarily viable, such as duplicating the product for public sale.

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Imagen 2. Análisis de conexión ESP32 - Servomotores

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