

SIMULATION OF SOLAR ENERGY SYSTEM IN IOT

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ABSTRACT: In order to improve the efficiency of house hold solar device management Internet of Things is used. This paper is considering role of IOT during solar power management. It has been observed that solar power is proven cost effective and environment friendly mechanism to provide power to home appliances. But there is need to provide the solar management system using IOT. The integration of IOT to manage solar power based appliances would be suitable to reduce the wastage of solar power.

Simulation work is representing the house hold status that are varying according to sun intensity, Battery Bank Amps and number of devices on and off. The Matlab has been used for simulation where status of all domestic devices with their influence on battery backup has been shown.

Keywords: IOT, Cells, Networks, Solar Energy System, Matlab, IOT.

[1] INTRODUCTION

The Internet of Things (IOT) becomes a structure of visible properties and items. Hardware, software, automobile, premises and lots of other material make this structure. All of these things are implanted in the company of computerized hardware, computer programs, sensing elements, network connectivity. Due to this, these materials are able to accumulate and transfer data. It becomes possible to sense and manage objects at a certain distance under the existing system structure. It provides opportunity in favor of direct combination of external world in the company of computer based systems. It increases performance, consistency & cost effective advantages.

SCOPE OF IOT

At present a significant contribution is done by artificial intelligence in our life style. It has been used in mostly fields such individuals, society and business daily. The use of IOT in health care system has been determined very useful for us.

A chip has been inserted within the patient. Such type of chip will inform to the doctor about the health related condition. This pattern will inform the doctor or his relatives present in the hospital if he is actually required the treatment or any type of care.

There is several use of IOT in many sectors. As well as it has been used in many sectors therefore there are several challenges that are faced during the use of such IOT things. The first issue is that it is very costly to setup such IOT system. The second thing is that it is essential for the user having the awareness about the IOT systems. The dependency of the user increases according to his use of such devices.

SOLAR POWER

As we all know that sun contains a lot of heat and energy. This energy can be converted in to other form of energy. Solar energy is the converted form of the sun's energy. The energy which is obtained after conversion is a non conventional source of energy. It means, a "green" source of energy. In solar energy production system water is heated through the heat of



sun rays. This boiled water is then used to heat the steam turbines. Energy generated from solar plants are used in various forms .

This amount of energy generate when the radiation coming out through Sun is exploited. These radiation are put under harness when different type of developed technologies are used. Photo voltaic cell, solar thermal energy, solar pattern and artificial photosynthesis are comes under the developed category of technology.

It becomes a very helpful source of non conventional energy. Different type of methods which are used for its generation exists either in the form of quiet or active methods. This form is decided by knowing the manner in which they harness and transmit solar energy or change it into solar power. All the methods like photovoltaic cells, concentrated solar power, and solar water heating which are used for exploiting the energy comes under the category of energetic methods. In comparison to this, all the methods like aligning of structure in Sun's direction, choosing of substance which contains lagre amount of thermal or qualities like light scattering comes under the category of quite methods.

At this point of time, sources by which solar energy generates are present in high magnitude. Due to this, it becomes a source of electricity generation whose demand is continuously increased. A developement programme related to the examination of energy produced in all over the world which was held in the year of two thousand in United Nations. Here in this program it brings in to notice that yearly capabilities of this energy source exists from fiveteen thousand to fifty thousand exajoules (EJ). This much amount of energy is very high in comparison

to the energy which was utilised by all over the world. Up to the year two thousand and twelve the overall utilisation of energy was 559.8 EJ.

It was said by the International Energy Agency said that When the cost effective, unlimited and obvious methods are formed for the generation of solar energy then they provide long-term advantages. This statement was given by the agencies which deal with the energy related issues in all over the world. This statement was given by them in the year of two thousand and eleven. It will make world safe in respect to energy generation because they are relaying on a natural, unlimited and an independent source of supply. The other most important points related to this source of supply are its continuity, pollution free, reduced the chances of global warming, and maintain the prices of fossil fuel in desirable limits. It is required to spend them wisely or they can be shared widely ".

Solar Panels

For the generation of solar energy these panels are used. The way in which they generate electricity is explained below

In the very its step these panels are made active by the radiation of sun. Solar panel is made up of silicon cells layer, a structure of mettalic shape, a covered shell of crystal and electrical installation devices. All the panels are connected in a very ordered way in order to form a chain of panel. When the panels are connected in this way and installed on roof they give higher efficiency. It is also possible to put them in open spaces. These cells becomes famous in the form of photovoltaic cells, harness the heat of sun at day time.

SOLAR POWER MONITORING SYSTEM USING IOT

It is possible to improve the efficiency, observation and handling of solar power generation plant when the technology connected with Internet of Things is used. Due to the increase in technologies the cost of hardware which are used in renewable energy plant reduced. It encourages usage of solar plant. These solar plants which are implemented in large amount need sophisticated systems in support of automation. These automation is required for the observations of plant from the places which are distant from plant. For this purpose a post which is derived on the basis of internet is employed. Most of plants are implemented in areas which are unapproachable. It becomes very difficult to observe them from a required position. For examine the efficiency of solar plant from distant position an economical method which is derived on the basis of IoT are used. When this method is used real time observations, handling, and identification of defects becomes easy.

For achieving maximum output from a plant time to time observation is necessary. When a plant is observed on regular basis then it becomes possible to achieve maximum output because the inappropriate connection of solar panels, dust connected on panels and some other problems which will make a huge impact of efficiency will resolved. A system which is derived on the basis of iot is used in order to observe the factors of solar system. This is a mechanical system. It permits the observation of solar plant from distant location. For this purpose a system which is derived on the basis of ATmega controller is employed. This system keeps a constant eye on solar plant system. It distrutes resultant power i the direction of IOT system. It is done with the help of web. At this point factors of solar power are allocated to server by internet. At this point it shows these variables in the direction of user. For this purpose

they employ graphical user interface in a very effective way. In addition to this, it also delivers warning signal in situations where output drops down below definite value. Due to this, remote controlling of solar plants becomes simple. It also give best power output. Construction of iot based monitoring system Solar power monitoring system using IoT

[2]OBJECTIVES OF RESEARCH

The objectives of research are as follow.

1. To implement this expert system for home automation.
2. Domestic devices could be managed remotely easily by user.
3. The power consumption and status of devices must be easily accessible to user.
4. User could be able to access home automation system to using graphical user interface

[3]TOOLS AND TECHNOLOGY

MATLAB

MATLAB is used in different sectors of education such as mathematics, academies. It is mostly useful in Universities for research purposes. MATLAB allows the execution of computationally tasks quicker as compare to other language. It has several toolboxes such as image tool box, simulink, simscape etc. Matlab is allowing performing tasks rapidly. It is performing better than languages.

Other Programming languages allow the user to perform tasks at a time. On the other hand MATLAB offers to work within complete matrices quickly & easily. In proposed work the integration of clustered approach would reduce the time consumption along with space in reinforcement learning system.

MATLAB-The full form of MATLAB is matrix laboratory. It has been known as an upgraded programming language. In the task related to technical computing are performed with the use of Matlab. Therefore it is considered as a user friendly software .In this software all the questions and their answers are presented in a well-known numerical form. Thousands of functions are incorporated in Mat lab. It is possible to draw 2Dimension and 3Dimension graph in MATLAB. It also provide a facility to user due to which any user can write down its own function. It is feasible due to the presence of huge quantity of apparatus. It can be used for various purposes which is illustrated below

1. Math and calculation
2. For the growth of algorithm

It can be used for the purpose of modelling, simulation

[4] CHALLENGES OF INTERNET OF THINGS

A lot of issues still exist in spite of possibilities which become possible because of IOT. Presence of similar arrangement, which is used by the people for the purpose of formation, accumulation and transmission of information threaten their integrity and safety. It becomes possible to use such type of similar methods for the purpose of targeted surveillance. ‘Information Society’ turns in to the form of ‘Surveillance Society’ when such methods are misused. Identity management systems become better in the absence of similar emphasis on anonymity. At present, most significant arrangement of societies are become so much complicated that management of these societies in an effective manner become a very difficult task. In situations where their formation and implementation are done in a smart way, it becomes possible to developed IOT

from the help of protocols arrangement. At the same time, structure which is old and whose donation is done in very poor way obstruct the additional development of IOT. Most of the daily life activities connected but some still remain unconnected. Conversely, other elements of individual’s daily life might be overwhelmed because advancement of latest hardware needs latest arrangements. Human abilities are also lacking in developing nations, in addition to financial support. Due to shortage of technically skilled IT professionals in domestic region, it becomes impossible to utilise these devices in daily lives.

[5] SIMULATION

SIMULATION IN DIFFERENT CASES

CASE 1

Refrigerator is on & sun intensity is 3



FIGURE 1 REFRIGERATOR IS ON & SUN INTENSITY IS 3

Case 2

Refrigerator & tv is on & sun intensity is 3

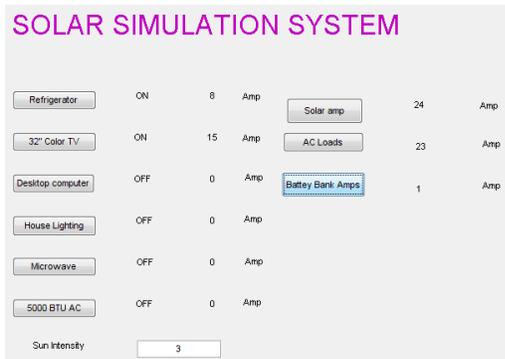


FIGURE 2 REFRIGERATOR & TV IS ON & SUN INTENSITY IS 3

Case 3: Refrigerator, tv, Desk computer is on & sun intensity is 3



FIGURE 3 REFRIGERATOR,TV,DESK COMPUTER IS ON & SUN INTENSITY IS 3

Case 4 : Refrigerator,tv,Desk computer & house lighting is on & sun intensity is 3



FIGURE 4 REFRIGERATOR, TV, DESK COMPUTER & HOUSE LIGHTING IS ON & SUN INTENSITY IS 3

Case 5: Refrigerator,tv,Desk computer, House lighting, microwave is on & sun intensity is 3

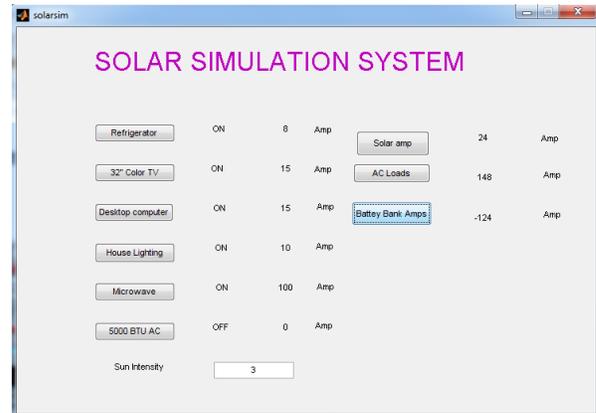


FIGURE 4 REFRIGERATOR, TV, DESK COMPUTER, HOUSE LIGHTING, MICROWAVE IS ON & SUN INTENSITY IS 3

Case 6: Refrigerator,tv,Desk computer,House lighting,microwave,5000 BTU AC is on & sun intensity is 3



FIGURE 5 REFRIGERATOR, TV, DESK COMPUTER, HOUSE LIGHTING, MICROWAVE, 5000 BTU AC IS ON & SUN INTENSITY IS 3.SOLAR PANEL AMPS, BATTERY BANK AMPS WHEN REFRIGERATOR IS ON.

TABLE 1 SOLAR PANEL AMP

Sun intensity	Solar Panel Amp	Battery Bank Amps
0	0	-8
1	8	0
2	16	8
3	24	16
4	32	24
5	40	32
6	48	40
7	56	48

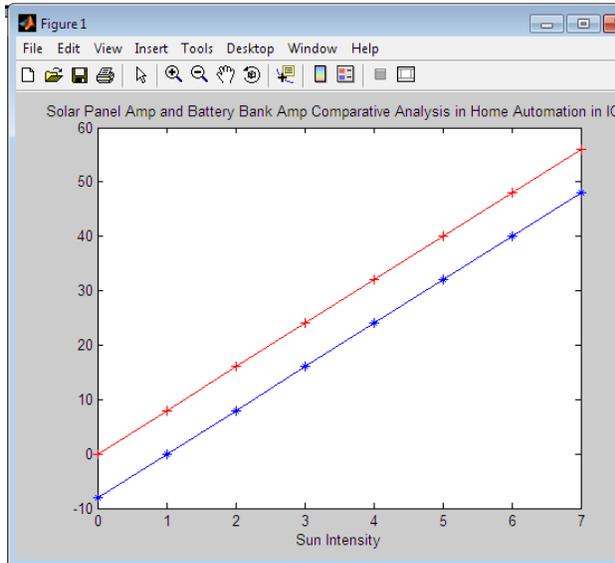


FIGURE 6 SOLAR PANEL & BATTERY BANK AMP COMPARATIVE ANALYSIS IN HOME AUTOMATION IN IOT

TABLE 2 TRADITIONAL AND PROPOSED

Sno	Traditional	Proposed
1	Remote device management was not possible	Manages devices remotely
2	Unable to represent status of all domestic	The status of all domestic devices with their influence on

	devices	battery backup has been shown.
3	Ignores the various intensity level of solar energy	Capable to simulate solar energy at multiple intensity levels.
4	Limited cases have been discussed	Lot of cases of AC load, power usage in solar system is considered.
5	Does not allows simulation to make power management plan	Allows performing simulation without using actual devices to perform power management.
6	Does not influence the cost factor	It is influencing the cost of b using simulated environment.

[6]CONCLUSION

Inside IOT, for scheduling and management of information transmission, a planned structural administration becomes essential. It becomes famous in the form of BPM. Everywhere that is a blending of traditional process management and special abilities are used, automatic control of devices is required. Within IOT, importance related to section depends upon its arrangement in place of inevitable method. It becomes an iconic network. As a result, this will not require those level by which preferring of all implementation is not possible: There are some elements and facilities which referred themselves itself and whenever they required they are adaptive to initiate normal levels. It is already provided by some researchers that the web of sensing elements becomes

very important element in relation to Internet of Things.

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