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Internet of Things

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Abstract. We are surrounded with various information and computing technologies. One of the computing technology which is very famous in the market is Internet of Things (IoT). IoT is a sort of "universal global neural network" in cloud which connects various things. Till now the type of communication which we have seen is either between human-human or human-machine but in IoT there is another form of communication in which the smart machines will be interacting and communicating with the other machines, environments, objects and infrastructure. The main aim of IoT is to combine in our world under a common infrastructure, which not only will gives us control over the things around us, but will also keep us informed of the state of things. The main objective of this paper is to provide a brief knowledge about the Internet of Things and its use in our daily life.

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1 Introduction

In today's world we are surrounded with many things like smart devices ,smart phones, smart cars ,smart homes and smart cities, these idea have been supported for over many years and for these effort goal investigation was done by many different disjoint communities of research. Some well known communities of research are: Internet of things (IoT), Pervasive computing, Wireless Sensor Networks (WSN), Mobile Computing (MC) and more recently Cyber Physical Systems (CPS).

Somehow, application and difficult situation solutions are on progress in every field in research. With high demand in industry and for better access control system smarter and useful technologies are important for all. There is a difference in life of mortal as well as in condition of working company, shortly after the arrival technologies. IoT has been fundamentally come from the needs of large company that maintain the profit significantly from the planning and expected afford by the potential to go after all objectives from the product series through which it is fixed. The capability to code and follow the objects allowed from organization to make more effective with speed up procedure, to minimize the error, preventing from theft in incorporate with complex and flexible organization through IoT. Consequently, the computer science, computer engineering and electrical engineering are involved in the smart vision of the world. The number of devices availing internet is increasing day by day having all of them connected by wire or wireless which will put a powerful source of knowledge at our finger tips. IoT has many opportunities and it is a hot topic in research. A sensing and actuation utility will not only exits in public spaces, but also extend into the home, apartments and office.

One application may help to perform many tasks and can detect and control the mastery of heart rate and can also help to accomplish commercial and investigation action on another direct ordering of the basic requirement like food or even related to medical problem can be addressed early and can avoid the problem. The goal of the paper is to raise the awareness of work and searching various research based on it so that we can have more things to use which can make human life easy.

2 Applications

The applications which we see in our daily life are already smart but they cannot communicate with each other and sharing important information will create a wide range of inventive applications. These turn up applications with some sovereign capabilities would surely improve the quality of our lives. Some of the applications like this are already available in the market. For example- Google Car, it is an initiative to provide a self-driving car experience with real-time traffic, weather, road conditions and other exchange of the information, this is all done because of the concept of IoT. So many applications based on IoT can be made in the future for great advantage. Here we present some of those applications-

1. **Smart home automation:**
    With the help of IoT we will be able to control our home appliances remotely as per our requirements. This will help us in reducing monthly bills and less

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power consumption. The gardening sensors will measure the light, humidity, temperature, moisture and other gardening essentials. Switching on/off appliances remotely so that accidents can be avoided and save energy. Detecting windows and doors whether they are closed or not, so that it could be prevented from intruders.

2. **Smart agriculture:**
India is a land of different weather conditions and versatile soils. Farmers face so much of problems because they do not have perfect knowledge about the soil, they are not aware that which crop will be optimally suited to be grown in such soil to and also due to the sudden rain and without accurate weather. IoT devices are used for solving such issues. IoT device will monitor light, humidity, soil nutrition, etc. The device will also improve the green housing experience by adjusting the temperature automatically to maximize the production of crops. Accurate fertilization and watering will help in saving water and fertilization. And the device will also help in controlling the humidity and temperature level to prevent crops from fungus

3. **Smart parking system:**
Internet of Things plays a huge role in connecting our surrounding things to the network and makes it easy to access the un-internet things from any distant location. In today's world, it is compulsory to be updated with the growing or latest technology. One of the other important and useful applications of IoT is automatic parking system. Nowadays people face so much of problem in parking vehicle or searching for a parking slot in cities. IoT device will help the user to find the nearby parking area and gives the availability in that particular parking slot. This device will help us in decreasing the time in finding the parking slots and also it avoids the useless travelling through parking lots in a parking area. The amount of carbon in the atmosphere also reduces as there will be less consumption of fuel because there will be no useless travelling.

4. **Smart hospital:**
A smart hospital based on IoT helps us to overcome from the disadvantages of today's hospital information system. The survey proves that the smart hospital can surely decrease the problem of the existing treatments and reports of the hospitals. In the medical field the technology of

internet of things is applied. From which some toppers put IoT in the field of healthcare or medical facilities such as Healthcare based on IoT Medicine based on IoT and some or the other concepts. Because of the use of IoT devices in hospitals people can get accurate and fast reports.

5. **Smart traffic system:**
Nowadays the parking is designed in different ways such as covered parking, open parking and street side parking. Smart traffic provides the information of the slots provided or the number of vehicles present there or the total no of the vehicles that can be parked at one time. And though this smart traffic system the vehicles are secured though access to some networks.
Smart traffic security consists of several parts:
   - Centralized server
   - Image capturing
   - User device
   - Display device

3 Security

Pervasive in the internet today is a fundamental problem that must be solved by dealing with security attacks. To be prevented from security attacks a system needs to identify the attack and find its solutions and repairs. All this should be performed in a lightweight manner because of the low capacity of the devices that are involved. Transient and permanent random failures are the security problems that are exacerbated and are commonplace. These are that susceptibility that can be oppressed by the attackers. To fulfill the requirement of the realistic system that extract from long-lasting unattended operation, applications of IoT must be able to continue to operate and to recover satisfactorily and effectively from the security attacks.

Downloading new code can be a solution but it itself has a great risk of security attacks. Heavyweight computation is required for the mainframe security solutions and also large memory is required. So finding a solution for IOT is a major research challenge. Sometime repair requires re-programming that is when an unknown attack occurs. The repairing instructions should be correctly explained or delivered to the correct node so that the running program of the node requires the amendment by the runtime architecture. The system should be ready for fighting against new attacks. Once the attack is found the reaction takes place on its own.

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The main reason for the security from attacks is because every system is different and require multi- layered approach.

Seven security measures are:

- Embedded security
- Protecting layers
- Secure edge device
- Protect network
- Cloud strategy
- Secure life cycle
- Application of correct technology

Although the new devices are coming up with full security but the costs are too much that dealing with the costs is very difficult.

4 Conclusion

IoT has abundant benefits and it is making our lives very easy, simple and comfortable though various technologies and application, it has been constantly bringing a sea of latest technological changes in our daily lives. This paradigm of networking will affect every part ranging from the automated house to smart health and environment monitoring by installing intelligence into the objects around us. There are innumerable uses of IoT applications into all realm including manufacturing, medical, industrial, education etc. To prevent unauthorized use of data, protect their privacy and to mitigate security and privacy threats strong network security infrastructures are required. This review paper provides the security solution approach and its identifying the challenges related to security. New research problems occur due to the massive devices. Current approaches are focused on pre-deployed, pre-shared keys on both ends. A united effort is required to move towards industry beyond the early stages of market development towards a level. The parts of technology puzzle are coming together to accommodate the Internet of Things and expected to come in between as soon as possible just like internet phenomenon arrived a short time ago and explored in world. It connects the environmental objects to the network and makes it easy to access those internet things.

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