|| Volume 3 || Issue 10 || October 2018 || ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH
AND ENGINEERING TRENDS

Smart Inference Model for IoT

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***Abstract*—The need for smart IOT applications is growing as IOT is becoming an integral part of our day to day life. Internet-of-Things (IoT) has already connected millions and millions of devices to the Internet and increasing every day. As the country is moving towards digitalization, the proposed smart IOT based system facilitates the need for inference of huge data that is generated by the IOT based devices. So we thought of designing a project which will decrease the excess amount of data generated by the system and sent to the cloud. A smart inference filter will be designed which will help to extract the unwanted data that are to be sent to the cloud servers. Machine learning algorithms will be implemented to decrease the amount of data transferred intelligently by various parameters. Our system will have a combination of Wi-Fi, Smart phone, Machine learning and cloud to achieve our goal.**

Keywords: *IOT, ESP8266, Android, Arduino, Spreadsheet, SVM, Naïve Bayes.*

I INTRODUCTION

IOT represents a paradigm where things communicate and cooperate with each other pervasively to achieve common goals. It has a distributed architecture made up of many complex systems ranging from small localized systems to a large global system. It has various IOT levels distributed over three distinct IOT layers that convert real world data into purposeful application insights. In essence, IOT is hierarchical in nature. There are three major computation levels in this framework: sensor, edge, and server. They vary greatly in available computing resources. Sensors have the easiest access to data but with the least computation power. Cloud servers possess the most computation power, but suffer from high data transmission cost and time delay. Edge nodes, such as smart phones and local computers, fall in between. These three computation levels are also spatially separated. To facilitate necessary communication among them, wireless transmission protocols, e.g., Bluetooth Low Energy, ZigBee, or Wi-Fi, amplify and encrypt the network data for transmission. They consume unwanted but unavoidable transmission energy. With its pervasive data collection and ability to distill intelligence from the data, IOT promises to make major headway in myriad applications.

II RELATED WORK

This chapter describes the fundamentals of IOT model. It helps in understanding various ideas put forward by various technical papers published by various pulishers.

1 :- In 2017 A. M. Nia and N. K. Jha authored a paper as a comprehensive study of security of Internet-of-Things explains itself as

Internet of Things (IoT), also referred to as the Internet of Objects, is viewed as a translating approach for providing numerous services. Compact smart devices with sensors constitute an essential part of IoT. They range widely in use, size, energy capacity, and computation power and vary from various paradigms. However, the integration of these smart things into the standard Internet gave rise to several security challenges. The majority of Internet technologies and communication protocols were not designed to support IoT as it was used conventionally without design for it. Moreover, as the more and more use of IoT has led to public security concerns, including personal privacy issues, threat of cyber attacks, and organized crime. In order to provide a view and guidelines for those who want to investigate IoT security and enhance the security the things to be studied are the edge-side layer of IoT, which consists of three levels described as (a) edge nodes, (b) communication, and (c) edge computing. To achieve this goal, we first briefly describe three widely-known IoT reference models and define security in the context of IoT. Second, we discuss the applications that arise from the use of IoT and potential motivations of the attackers who target this new architecture. Third, we discuss different attacks and threats that arise from the use of IoT. Fourth, we describe possible security measures that can avoid attacks.

2 In 2014 Dhananjay Singh , Gaurav Tripathi and Antonio J. Jara authored A survey of Internet-of-Things: Future vision, architecture, challenges and service explains itself as

Internet-of-Things (IoT) is the combination of Internet with RFID, Sensor and smart objects. IoT can be defined as "things belonging to the Internet" that can handle and access all of real-world information. Billions of devices are expected to be attached to IoT in the near future and shall require huge distribution of networks as well as the process of transforming raw data into meaningful inferences. IoT is the biggest and smartest promise of the technology today, but still lacking a novel mechanism, which can be perceived through the lenses of Internet, things and semantic vision. This paper presents a

unique paradigm model for IoT with the help of Semantic Fusion Model (SFM). This paradigm introduces the use of Smart Semantic framework to extract and analyze the processed information from sensor networks. The smart embedded system is having linguistic logic and linguistic value based Information to make the system an intelligent system. This paper presents a discussion on IoT applications, services, visual aspect and challenges for IoT using RFID, 6lowpan and sensor networks

3 :- In 2010 Dae-Man Han and Jae-Hyun Lim authored Smart Home Energy Management System using IEEE 802.15.4 and ZigBee explains itself as

WPAN and WSN are rapidly gaining popularity, and the IEEE 802.15 Wireless Personal Area Working Group has defined no less than different standards so as to cater to the requirements of different applications. The ubiquitous home network has gained widespread popularity and attention due to its seamless integration into everyday life. This contemporary system uniquely identifies various home appliances, smart sensors and energy technologies. The smart energy market network requires two types of ZigBee networks for device control and energy management. Today, organizations use IEEE 802.15.4 and ZigBee to effectively deliver explanations and support for a variety of areas including consumer electronic device control, energy management and efficiency, home and commercial building automation and industrial plant management. We present the design and implementation technique of a multi-sensing, heating and air conditioning system and actuation application – the home users: a sensor network-based smart light control system for smart home and energy control production. This paper designs and explains smart home device descriptions and standard practices for demand response and load management "Smart Energy" applications needed in a smart energy based residential or light commercial environment. The design, implementation and control application domains included in this initial version are sensing device control, pricing and demand response and load control applications. This paper designs and implements a smart home interfaces and device definitions to allow interoperability among ZigBee devices produced by various manufacturers of electrical equipment, meters, and smart energy enabling products. We introduced and implemented the proposed home energy control systems design that provides intelligent services for users and we demonstrate its implementation using a real testbed.

4 :- In 2016 Nomusa DLODLO , Oscar Gcaba and Andrew SMITH authored Internet of Things Technologies in Smart Cities which explains itself as

A smart city can be explained and interpreted as a developed urban area that excels in the area of economy, governance, people and life through strong human capital, social capital and ICT infrastructure. It is a new approach and paradigm to managing the complexity of city life, increase efficiency, reduce expenses and improve the quality of life of the citizens. This paper is on potential implementation and design of smart cities applications as applied to the domains of smart transport, smart tourism and recreation, smart health, ambient-assisted living, crime prevention and community safety, governance, monitoring and infrastructure, disaster management, environment management, refuse collection and sewer management, smart homes and smart energy and thus handling the day to day hiccups of a citizen. These smart cities applications in the new world paradigm support the future vision of cities, which aim at exploiting ICTs, namely internet of things technologies (IoT), for value-added service delivery. Furthermore, the paper presents a technical solution for energy control and comfort in a home for proof of concept of a smart city infrastructure application. The demonstrator described here is on how smart applications can manage energy control and comfort in a room that has a varied number of people and electrical appliances, with each being a source of heat.

5 :- In 2016 Praveen Kumar, Umesh Chandra Pati authored IoT Based Monitoring and Control of Appliances for Smart Home which explains itself as

The recent technology and innovation in home automation provides security, safety and comfortable life at home. That is why in the day to day environment and fast world, home automation technology is required for every person. This purposed paper and technique of home automation technology provides smart monitoring and control of the home appliances as well as door permission system for interaction between the visitor and home/office owner.. The system has many advantages such as low-cost design, user-friendly interface, and easy installation in home or multi-purpose building. Using this technology and implementation, the consumer can reduce the wastage of electrical power by regular monitoring of home appliances or the proper ON/OFF scheduling of the devices.

III PROBLEM STATEMENT

The growth of IOT has been phenomenal. In 2016, there were more than 17.6 billion IOT devices worldwide. This number is predicted to reach 50 billion by 2020, more than six times the human population of 7.6 billion forecasted for that year. This is leading to an explosion in the volume of IOT data. IDC predicts that the current 4.4 Zettabyte of IOT data universally will grow another 10×by 2020. This imposes a heavy burden on the IOT framework. Current IOT frameworks suffer from limited sensor energy budget, constrained communication channel capacity, and curbed storage space. These limitations preclude transmission of IOT data.

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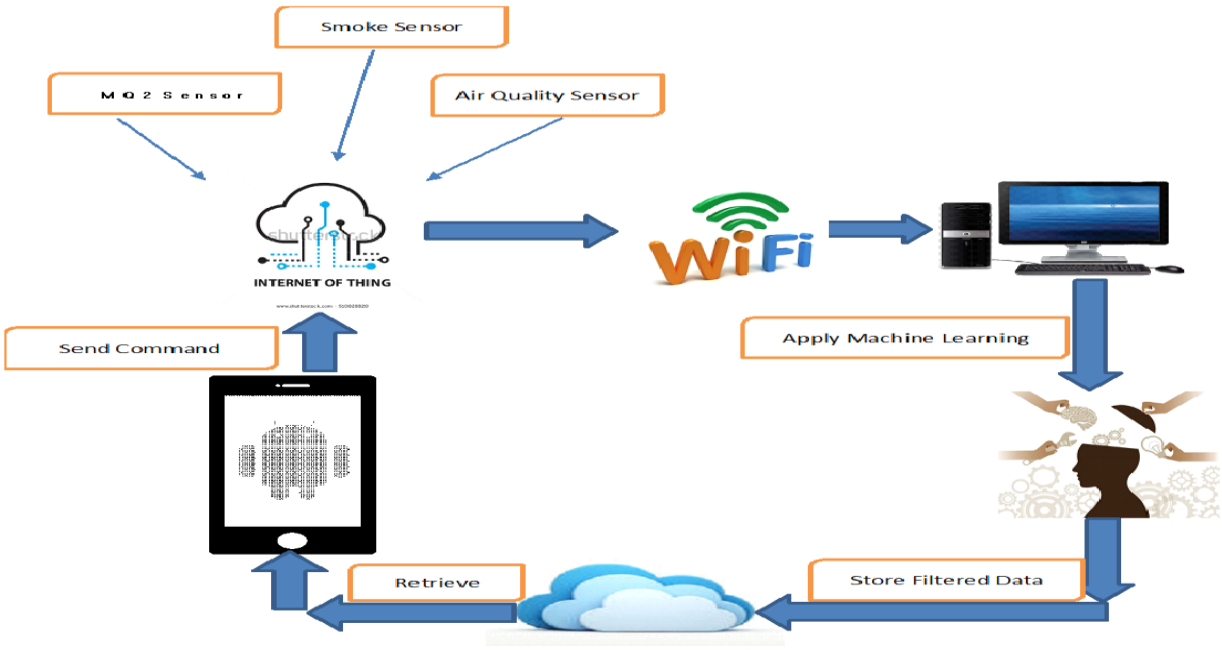
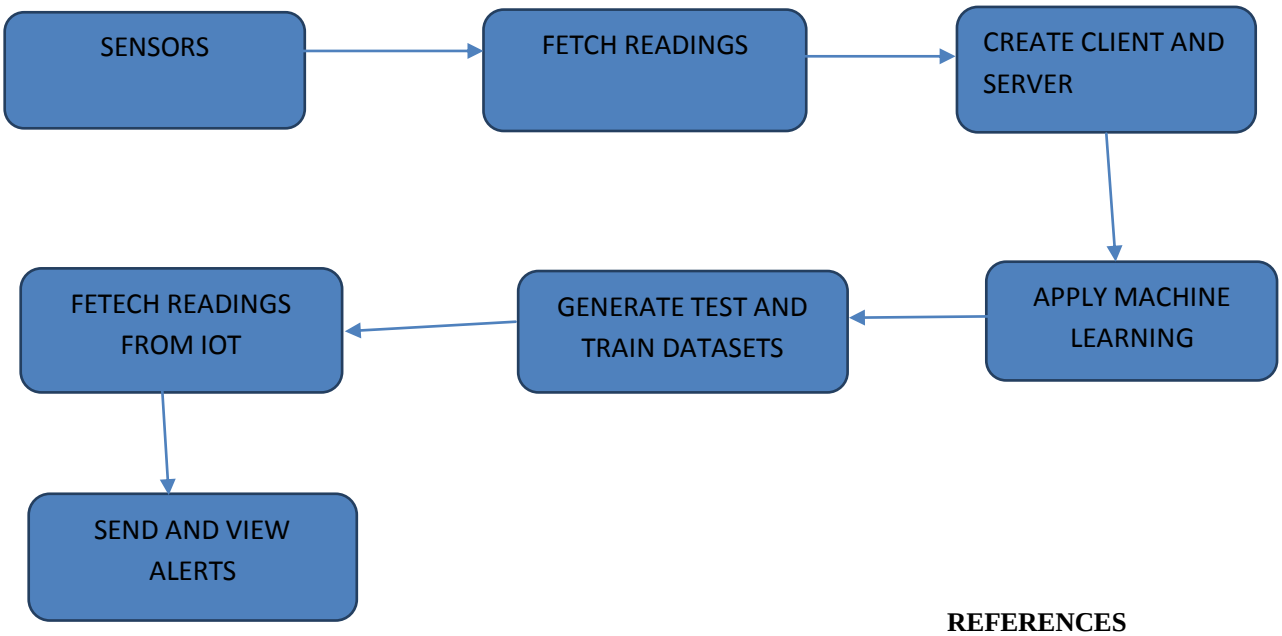
IV SYSTEM ARCHITECTURE/SYSTEM OVERVIEW



V SYSTEM ANALYSIS



VI CONCLUSION

In this paper, we are developing novel IOT inference model using IOT, Machine Learning and Cloud Computing together. The basic idea of the project is to find out the environment around us i.e whether it id safe or not using various sensors and analyzing the readings according to it. We are going to assemble various predictions by machine learning algorithms together and view the results in three classes such as safe, unsafe and neutral according to the predictions returned by the system.

REFERENCES

[1] A. M. Nia and N. K. Jha, "A comprehensive study of security of Internet-of-Things," IEEE Trans. Emerging Topics in Computing, vol. 5, no. 4, pp. 586–602, Oct. 2017.

[2] A. Nordrum, "The internet of fewer things," IEEE Spectrum, vol. 53, no. 10, pp. 12–13, Oct. 2016.

[3] J. Gubbi, R. Buyya, S. Marusic, and M. Palaniswami, "Internet of things(IoT):A vision, architectural elements, and future directions," Future Generation Computer Systems, vol. 29, no. 7, pp. 1645–1660, 2013.

[4] (2014) The digital universe of opportunities: Rich data and the increasing value of the internet of things. [Online].

Available:https://www.emc.com/leadership/digital-universe/2014iview/index.html

[5] H. Yin, B. H. Gwee, Z. Lin, A. Kumar, S. G. Razul, and C. M. S. See, "Novel real-time system design for floating-point sub-Nyquist multi-coset signal blind reconstruction," in Proc. IEEE Int. Symp. Circuits and Systems, May 2015, pp. 954–957.

[6] M. N. Halgamuge, M. Zukerman, K. Ramamohanarao, and H. L. Vu, "An estimation of sensor energy consumption," Progress In Electromagnetics Research B, vol. 12, pp. 259–295, 2009.

[7] F. K. Shaikh, S. Zeadally, and E. Exposito, "Enabling technologies for green internet of things," IEEE Systems J., vol. 11, no. 2, pp. 983–994, Jun. 2017.

[8] K. H. Lee and N. Verma, "A low-power processor with configurable embedded machine-learning accelerators for high-order and adaptive analysis of medical-sensor signals," IEEE J. Solid-State Circuits, vol. 48, no. 7, pp. 1625–1637, 2013.

[9] M. Shoaib, N. K. Jha, and N. Verma, "Signal processing with direct computations on compressively sensed data," IEEE Trans. Very Large Scale Integr. Syst., vol. 23, no. 1, pp. 30–43, 2015.