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Novel Weather Alert and Logger System using IOT, Cloud and Sensors

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Abstract: *The IoT and cloud based Weather Alert and Logger Software is a Raspberry Pi based project. IoT is Internet of Things and is the network of interconnected devices which are embedded with sensors, network, network connectivity and necessary electronics that enables them to collect and exchange data making them responsive. The Weather Alert and Logger Software is used to sense the weather conditions using sensors and collect temperature and humidity data and store it on to Cloud. It also retrieves data from Cloud and updates it after every specified time interval. The users receive the updated data on their smart phones. The purpose of the project is to monitor the weather conditions as per desirability. The software can be used in various fields like, pharmaceutical warehouses, oil refineries, dairy product warehouses, hospitals where it is important to maintain a particular weather conditions. The Software is also very cost effective and easily implementable.*

Keywords: *Raspberry Pi, Sensor, Temperature, IoT, Cloud, Python*

I. INTRODUCTION

An important part of human life is weather. Not only does it have an impact on all living and nonliving things but the change in the temperature can bring about differences in the environment and lives. Due to this weather monitoring becomes an important task. It's important we understand the change in the temperature in order to take the right measures and decrease the impact of the changes in the temperature. The Weather Alert and Logger system is an IoT based device that can monitor temperature and indicate it beforehand in order to take precautionary measures.

IoT is Internet of Things and is the network of interconnected devices which are embedded with sensors, network, network connectivity and necessary electronics that enables them to collect and exchange data making them responsive. Each thing is uniquely identified through its embedded computing system but is able to inter-operate within the existing Internet infrastructure. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention.

The data from the sensors are processed by the Raspberry Pi which acts as a data logger. The logged data can be moved to a desktop for further monitoring. Such a system can be used in industries, refineries, forest and farms where temperature change can create problems.

II. PROPOSED SYSTEM

The proposed system is based on Raspberry pi which consists of the latest wireless technology. The system is created in order to measure and record the parameters of the atmosphere without human efforts. The temperature sensors sense the temperature and the humidity and this data is stored on to the cloud. The data is then retrieved from cloud and displayed to the user. The data is updated every 5 seconds and is visible to the user. As all the data is saved on Cloud, there is no loss of data and the recorded data can be viewed at any point of time. The system has fixed constraints and when the temperature goes above or falls below the constraint, the system instantly notifies the user because of which the user can take safety measures.

When the system is active, it gives you updates on the temperature on the display/smartphone. It helps you monitor the desired area. IoT helps you find the exact situation of the area. Raspberry Pi is used in order to reduce complexity.

The application where the results are displayed is our weather station.

The system is highly useful in farms where the healthy growth of crops depends on the weather conditions. Monitoring the weather conditions can lead in a better yield

and prevent loss. Also in order to maintain a safe working environment in the industries, weather monitoring becomes essential.

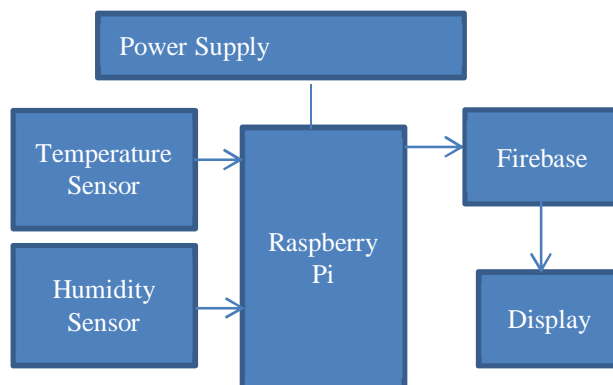


Figure 1: Block diagram of Weather Alert and Logger System

III. IMPLEMENTATION

A. Components Description

The proposed system consists of the following components:

- 1) **Raspberry Pi board:** The Raspberry Pi foundation developed the Raspberry Pi which is a series of small single-board computers. It uses the Linux operating system and it is most used for IoT projects as it can be directly connected to the internet. For direct connections, Raspberry Pi has 40 GPIOs. Different sensors can be interfaced with general purpose input output (GPIO) of Raspberry Pi board for environmental parameter monitoring. The credit card sized device can do many functions like word processing to playing games. The Broadcom BCM2835 system based Raspberry Pi consists of ARM1176JZF-S runs on 700 MHz processor, and primarily works on 256 megabytes of RAM, later upgraded to 512 MB. This system uses micro SD cards for saving data, so it is easier to organize and on equivalent hardware it can run many different operating systems. The GPIO pins have different uses individually such as power supply, ground, clock, UAR. The Raspberry Pi featuring of a 40-Pin GPIO header, 4 x USB ports, 1x LAN port, also 1x CSI and 1x Touch Screen interface, 1x HDMI port, also 1x integrated audio and video output port. So there is no need to have large SD card. Figure 1 shows the Raspberry Pi B+ Model.



Figure 2: The Raspberry Pi Model

- 2) **DHT11 Sensor** is an ultra low-cost, basic digital temperature and humidity sensor. Its technology ensures the high reliability and excellent long-term stability. Good for 20-80% of humidity measurement and 0-50°C of temperature measurement. The sensor uses a thermistor and resistive humidity sensor to measure the surrounding air and displays a digital signal on data pin.
- 3) **LAN Cable (Local Area Network)** is used connect the Raspberry Pi to the internet, with which the real time parameters at any remote location and be accessed. The connectivity is way higher using a LAN cable.
- 4) **HDMI Display:** In order to view the current status or results, the measure of the temperature and humidity, we need a HDMI display which could be a webpage or a Smartphone.
- 5) **External SD Card:** The external storage is used in order to store the operating system Raspbian.
- 6) **Connecting Wires:** In order to connect the components and set it up to bring the system into working.
- 7) **Keyboard:** In order to provide inputs

B. Software Requirements

- 1) *Raspbian*: Raspbian is free and open source software. Raspbian operating system is based on Linux kernel. An SD card is used to install an operating System.
- 2) *Python*: Recommended language for Raspberry Pi as it works on the Linux operating system. Python is a simple, dynamic, interpreted, object oriented language. Python is designed to be highly readable.
- 3) *Firebase*: Firebase is a NoSQL cloud database. A NoSQL database provides a mechanism for storage and retrieval of data that is modeled in means other than the tabular relations used in relational databases. The Firebase Realtime Database is a cloud-hosted database. Data is stored as JSON and synchronized in realtime to every connected client. Firebase is used in order to store the recorded parameters and view it.
- 4) *Adafruit*: It is a Python library which needs to be installed in order to use the temperature sensor or import any python statements.

IV. RESULTS AND CONCLUSION

The Raspberry Pi is a device capable of being a weather station as it is compact but a powerful device. RPI GPIO library is needed which gives access to raspberry PI's GPIO's is get accessed by RPI GPIO library which additionally needed by for final programming. And the HTTPLIB which can access internet connection of raspberry and over internet data pushed on the server. Data that's available on the cloud can be viewed at any point of time and can be retrieved using applications. The system is efficient in situations where manually monitoring is highly impossible.

The table below shows the comparison between the different models of Raspberry Pi in terms of cost, memory capacity and other features.

Different Models of Raspberry Pi

Table 1: Raspberry Pi Models

| Parameter Zx | Model B+ | Model 2 | Model 3 |
|--------------------|-------------|---------|---------|
| GPIO Ports | 40 | 40 | 40 |
| Processing Speed | 700 MHZ | 900 MHZ | 1.2GHZ |
| RAM | 512 MB | 1GB | 1GB |
| Bluetooth and WiFi | No | No | Yes |
| USB Ports | 4 USB | 4 USB | 4*USB2 |

V. CONCLUSION & FUTURE SCOPE

The scope of this system is very high as high. IoT is just seeing daylight and will be put into practice in various ways. A similar system can be used for data monitoring and other projects where manual efforts need to be reduced and various things must be taken care of. The use of Raspberry Pi makes the applications of this system limitless. The system can be used in farms where it is important to have the right temperature for a good yield, in forests to prevent unexpected fires or in order to take safety measures, and in various places where change in temperature could lead to disasters. The system can also be used in industries where temperature plays and important role in various processes. Also because of the use of Raspberry Pi which acts like a complete computer, we can program the system in order to receive results in text messages and emails or as an app notification.

As the systems applications falls under remote areas and the system is very inexpensive, it can be set up very easily.

With the use of many more sensors such as pressure sensors, light sensors and moist sensors, the system can be used for automatic irrigation control which is likely to reduce most efforts of farmers.

REFERENCES

- [1] Dr. Mohan Kumar S & Dr. Balakrishnan, Classification Of Breast Mass Classification – CAD System And Performance Evaluation Using SSNE, IJSET – International Journal of Innovative Science, Engineering & Technology, Vol. 2, Issue 9, 417-425, ISSN 2348 – 7968
- [2] Dr. Mohan Kumar S, Dr. Balakrishnan, Classification Of Breast Mass Classification – CAD System With Performance Evaluation, International Journal of Engineering And Computer Science, Volume 4, Issue 09, 14187-14193, ISSN 2319-7242, September, 2015
- [3] Dr. Mohan Kumar S, Dr. Balakrishnan, Classification Of Breast Microcalcification- CAD System And Performance Evaluation Using SSNE, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 5, Issue 9, 824-830, ISSN: 2277 128X, Sep- 2015
- [4] Dr. Mohan Kumar S, Karthikayini, Essential Best Practices And Processes In Higher Educational Technical Institutions, International Journal Of Engineering Research And General Science, Volume 3, Issue 6, 231-236, ISSN 2091-2730 231, December, 2015
- [5] Dr. Mohan Kumar S, Karthikayini, LNW-A System Model For A High Quality Effective E-Learning Using Cloud Environs, International Journal of Current Research and Review, Volume 7, Issue 23, 21-25, ISSN: 0975-5241, December, 2015
- [6] Dr. Mohan Kumar S, Ayurveda Medicine Roles In Healthcare Medicine, And Ayurveda Towards Ayurinformatics, International Journal of Computer Science and Mobile Computing, Volume 4, Issue 12, 35-43, ISSN 2320-088X, December, 2015
- [7] Dr. Mohan Kumar S, Muralidhara, Importance Of Accreditation And Autonomous Status In HEI – An Assessment With Special Orientation To Karnataka State, International Journal of Engineering Sciences & Research Technology, Volume 5, Issue 1, 472-479, ISSN : 2277-9655, January, 2016
- [8] Dr. Mohan Kumar S, Interrelated Research Works And Importance Of Object Oriented Analysis And Modeling, International Journal of Engineering Sciences & Research Technology, Volume 5, Issue 1, Page Numbers:59-62, ISSN : 2277-9655, January, 2016
- [9] Dr.S Mohan Kumar, R.Jaya, A Survey On Medical Data Mining – Health Care Related Research And Challenges, International Journal of Current Research, Volume 8, Issue 01, Page Numbers; 25170-25173, ISSN:0975-833X, January, 2016
- [10] R.Jaya, Dr S Mohan Kumar, A Study On Data Mining Techniques, Methods, Tools And Applications In Various Industries, International Journal of Current Research & Review, Volume 8, Issue 04, Page Numbers:35-43, ISSN:0975-5241, January, 2016
- [11] Clara K, Dr S Mohan Kumar, Cyber Crime Variant Activities And Network Forensic Investigation, International Journal of Emerging Technology and Advanced Engineering, Volume 6, Issue 04, Page Numbers: April 2016, ISSN:2250-2459, March, 2016,
- [12] Clara.K, Dr S Mohan Kumar, Exploratory Study Of Cyber Crimes, Digital Forensics And Its Tools, International Journal of Emerging Technology and Advanced Engineering, Volume 6, Issue 04, Page Numbers: April 2016, ISSN:2250-2459, March, 2016
- [13] Revathi Y, Dr S Mohan Kumar, Efficient Implementation Using RM Method For Detecting Sensitive Data Leakage In Public Network International Journal of Modern Trends in Engineering and Research, Volume 3, Issue 04, Page Numbers: 515-518, ISSN (Online):2349–9745 ISSN (Print):2393-8161, April, 2016
- [14] Revathi Y, Dr S Mohan Kumar, Review On Importance And Advancement In Detecting Sensitive Data Leakage In Public Network, International Journal Of Engineering Research And General Science, Volume 4, Issue 02, Page Numbers:263-265, ISSN:2091-2730, April, 2016
- [15] Revathi Y, Dr S Mohan Kumar, A Survey On Detecting The Leakage Of Sensitive Data In Public Network International Journal of Emerging Technology and Advanced Engineering, Volume 6, Issue 03, Page Numbers:234-236, January, 2016
- [16] Mr.Dilish Babu.J, Dr.S Mohan Kumar, A Survey On Secure Communication In Public Network During Disaster, IJESRT -International Journal Of Engineering Sciences & Research Technology, Volume 5, Issue 3, Page Numbers:430-434, ISSN: 2277-9655, March 2016
- [17] Mr.Dilish Babu.J, Dr.S Mohan Kumar, Survey On Routing Algorithms During Emergency Crisis Based On MANET, IJETAE, International Journal of Emerging Technology and Advanced Engineering, Volume 6, Issue 3, Page Numbers: 278-281, ISSN: 2250–2459, Mar-16
- [18] Mr.Dilish Babu.J, Dr.S Mohan Kumar, Emergency Communication System For Natural Disaster Using MANET, IJRDO, International Journal of Research and Development Organization, Volume 2, Issue 5, Page Numbers:01 to 10, ISSN:2456-1843, May, 2016
- [19] Ms.Sulochana Panigrahi, Dr S Mohan Kumar, Social Data Analysis Using Big-Data Analytic Technologies- Apache Flume, HDFS, HIVE, IJRDO, International Journal of Research and Development Organization, Volume 2, Issue 5, Page Numbers:16 to 21, ISSN:2456-1843, May, 2016
- [20] Ms.Sulochana Panigrahi, Dr S Mohan Kumar, Social Media Analysis Using Apache Flume, Hdfs, Hive, International Journal of Current Trends in Engineering & Technology, Volume 2, Issue 2, Page Numbers:282 to 285, ISSN:2395-3152, March, 2016
- [21] Dr. V. ILANGO and Dr. S. Mohan Kumar, Factors For Improving The Research Publications And Quality Metrics International Journal of Civil Engineering & Technology (IJCIET) ISSN 0976-6308 and 0976-6316(Print&Online) Volume 8, Issue 4, 04-17,
- [22] Naga Raju Hari Manikyam and Dr. S. Mohan Kumar, Methods And Techniques To Deal With Big Data Analytics And Challenges In Cloud Computing Environment, International Journal of Civil Engineering & Technology (IJCIET), ISSN 0976-6308 and 0976-6316(Print&Online), Volume 8, Issue 4, 04-17,
- [23] V Karthik, Dr.S. Mohan Kumar and Ms. Karthikayini, A Novel Survey On Location Based Node Detection And Identifying The Malicious Activity Of Nodes In Sensor Networks International Journal of Civil Engineering & Technology, (IJCIET), ISSN 0976-6367 and 0976-6375(Print & Online), Volume 8,
- [24] Karthik V, Ms.Karthikayini, Dr S Mohan Kumar, Ms Gayathri T, Geocentric Based Node Detection And Revoking Malicious Node In WSN, International Journal for Science and Advance Research in Technology (IJSART), ISSN 2395-1052 (Print&Online), Volume 3, Issue 4, 04-17
- [25] Dr.S. Mohan Kumar and Dr G. Balakrishnan, Wavelet And Symmetric Stochastic Neighbor Embedding Based Computer Aided Analysis For Breast Cancer, Indian Journal of Science and Technology ISSN 0974-6846 and 0974-5645(Print&Online), Volume 9, Issue 47, 12-16
- [26] Sruthi Hiremath, Sheba Pari N and Dr.S. Mohan Kumar, Booster in High Dimensional Data Classification, (DOI: 10.15680/IJIRCC.2017. 0503349), International Journal of Innovative Research in Computer and Communication Engineering, Vol. 5, Issue 3, March 2017, 5984-5989.
- [27] Dr S. Mohan Kumar & Dr.T.Kumanan, Skin Lesion Classification System and Dermoscopic Feature Analysis for Melanoma Recognition and Prevention, IJETAE, International Journal of Emerging Technology and Advanced Engineering, ISSN: 2250–2459 and Volume 7, Issue 7, July 2017,
- [28] Dr S. Mohan Kumar & DrJitendranathMungara, J. Karthikayini, Design and implementation of CNN for detecting Melanoma through image processing, International Journal for Research in Applied Science and Engineering Technology, ISSN : 2321 – 9653, Volume 6, Issue - 3, March – 2018 in (DOI : 10.22214) pp. No.: 2249-2253
- [29] Dr S. Mohan Kumar & J. Karthikayini, Surveys on Detection of Melanoma through image processing Techniques, International Journal for Research in applied science and Engineering Technology (IJRASET), ISSN : 2321 – 9653, volume 6, Issue III, March 2018 in IJRASET, DOI: 10.22214, pp. no.: 1699-1704



- [30] Dr S. Mohan Kumar, Automated Segmentation of retinal images, International Journal of Engineering and Technology, UAE, July 2018, International Journal of Engineering and Technology, UAE
- [31] Dr. S. Mohan Kumar & Anisha Rebinth, Automated detection of Retinal Defects using image mining, A review, European Journal of Biomedical and Pharmaceutical Sciences, European ISSN : 2349 – 8870, Volume 5 , Issue : 01 year : 2018, pp No.: 189 – 194
- [32] Dr. S. Mohan Kumar & Dr.T.Kumanan, Analysis on skin Lesion classification systems and Dermoscopic Feature Analysis for Melanoma International Journal for Research in Applied Science and Engineering Technology (IJRASET), ISSN : 2321 – 9653, Volume 6, Issue - 3, March – 2018 in (DOI : 10.22214), pp. no.:1971-78
- [33] Dr. S. Mohan Kumar & Dr.T.Kumanan, Study on skin Lesion Classifications system and Dermoscopic Feature Analysis for Melanoma, International journal of Creative Research Thoughts (IJCRT), IJCRT1802680, ISSN : 2320 – 2882, Volume 6, issue-1, March 2018, Page No . 1863 – 1873
- [34] Dr. S. Mohan Kumar & Dr.T.Kumanan, Classification System and Dermoscopic Features Analysis for Melanoma recognition and Prevention, International journal of Creative Research Thoughts (IJCRT), IJCRT1802680, ISSN : 2250 – 2459 , Volume 7 , Issue 8, August 2017 , pp no: 351 – 357
- [35] Dr. S. Mohan Kumar & Darpan Majumder, Healthcare Solution based on Machine Learning Applications in IOT and Edge Computing, International Journal of Pure and Applied Mathematics, ISSN: 1311-8080 (printed version) ISSN: 1314-3395 (on-line version) Jul 2018 issue.
- [36] Dr. S. Mohan Kumar, Ashika.A, A Survey on Big Data Analysis, Approaches and its Applications in the real World, Journal of Emerging Technologies and Innovative Research, ISSN: 2349-5162, May 2018 , Volume 5, Issue 5, pp. no.: 93-100
- [37] Shreya R, Sri Lakshmi Chandru, Vivek Kumar, Shwetha M, Dr. S. Mohan Kumar, Classification of Skin Cancer through image processing and implementing CAD System International journal of Creative Research Thoughts (IJCRT)IJCRT1802680m, ISSN : 2320 – 2882, Volume 6, issue-2 , April 2018 Page No . 1863 – 1873
- [38] S Mohan Kumar & Dr. Balakrishnan, Statistical Features Based Classification of Micro calcification in Digital Mammogram using Stochastic Neighbour Embedding, International Journal of Advanced Information Science and Technology, 2012, ISSN:2319-2682 Volume 07, Issue 07 , November 2012, Page Numbers: 20-26
- [39] S Mohan Kumar & Dr. Balakrishnan ,Breast Cancer Diagnostic system based on Discrete Wavelet Transformation and stochastic neighbour Embedding, European Journal of Scientific Research, 2012, ISSN:1450-216X ,Volume 87, Issue 03 , October 2012, Page Numbers: 301-310
- [40] S Mohan Kumar & Dr. Balakrishnan, Classification of Microcalcification in digital mammogram using SNE and KNN classifier, International Journal of Computer Applications - Conference Proceedings published in IJCA, 2013 ISBN: 973-93-80872-00-6, ICETT proceedings with IJCA on January 03,2013, Page Numbers: 05-09
- [41] S Mohan Kumar & Dr. Balakrishnan, Mutiresolution analysis for mass classification in Digital Mammogram using SNE, IEEE international Conference- ICCSP-13 organized by Athiparasakthi Engineering College, Chennai , 2013, ISBN:978-1-4673-4864-5, Page Numbers: 2041-2045.
- [42] S Mohan Kumar & Dr. Balakrishnan, Categorization of Benign And Malignant Digital Mammograms Using Mass Classification – SNE and DWT, Karpagam Journal of Computer Science, 2013, ISSN No: 0973-2926, Volume-07, Issue-04, June-July-2013, Numbers: 237-243.
- [43] S Mohan Kumar & Dr. Balakrishnan, Classification of Micro Calcification And Categorization Of Breast Abnormalities - Benign and Malignant In Digital Mammograms Using SNE And DWT, Karpagam Journal of Computer Science 2013, ISSN No: 0973-2926, Volume-07, Issue-05, July-Aug, 2013. Page Numbers: 253 to 259
- [44] S Mohan Kumar & Dr. Balakrishnan, The Performance Evaluation of the Breast Mass classification CAD System Based on DWT, SNE AND SVM , International Journal of Emerging Technology and Advanced Engineering, 2013, ISSN 2250–2459, Volume 3, Issue 10, October 2013, Page Numbers: 581-587
- [45] S Mohan Kumar & Dr. Balakrishnan ,The Performance Evaluation of the Breast Microcalcification CAD System Based on DWT, SNE AND SVM, CiiT International Journal of Digital Image Processing, 2013, Print: ISSN 0974 – 9691 & Online: ISSN 0974 – 9586, Issue-November 2013, Page Numbers / DOI: DIP112013005.



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