International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

A SURVEY ON EVENT DETECTION IN WIRELESS SENSOR NETWORKS FOR DISASTER MANAGEMENT

S.Dhivya[1], Mrs.Dr.P.Sumitra[2],
[1]M.Phil Full time Research Scholar, PG and Research Department of Computer Science[1]
[2]Asst. Professor, Department of Computer Science[2]
Vivekanandha College of Arts & Sciences for Women (Autonomous),
Tiruchengode,Namakkal-637 205,
Tamil Nadu, India
dhivyasmsc.92@gmail.com1
sumitravaradharajan@gmail.com[2]

ABSTRACT- Wireless Sensor network is having tremendous growth in current world due to low cost sensor and well planned techniques. Wireless sensor networks (WSNs) have become mature enough to go beyond being simple fine-grained continuous monitoring platforms and become one of the enabling technologies for disaster early-warning systems. This technology can be used to detect the particular event which can be helpful to manage the disaster. Until now various techniques of event detection have come forward and effectively contributed to manage the disaster. In this paper, we introduce ML (Machine Learning) techniques for distributed event detection in WSNs and evaluate their performance and applicability for early detection of disasters, specifically residential fires. To this end, we present a distributed event detection approach incorporating a novel reputation-based voting and the decision tree to evaluate its performance in terms of detection accuracy and time complexity.

Keywords: Disaster Early Warning Systems, Event Detection, Sensor Networks

1. INTRODUCTION

WSNs typically consist of a large number of Sensor Nodes distributed over a certain region. Sensor Nodes have different vitality and computational requirements as a result of the organization of Sensor Node in unfriendly situations. Figure 1 shows a general architectural diagram of the Sensor Network. WSNs make simple observing and controlling of physical situations from remote areas.

WSN have applications in an assortment of fields such as environmental monitoring, climate control, military surveillance, and structural health monitoring, medical diagnostics, disaster management, and emergency response, air pollution monitoring and gathering data in blunder inclined situations

Disaster Management is an enormous assignment. They could barely encase to a specific

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

area that neither do they vanish as fast they show up.

WSN can be useful to disaster management in two ways. Firstly, WSNs has empowered a more helpful early warning system and secondly, WSN provides a system able to learn about the phenomena of natural disasters.

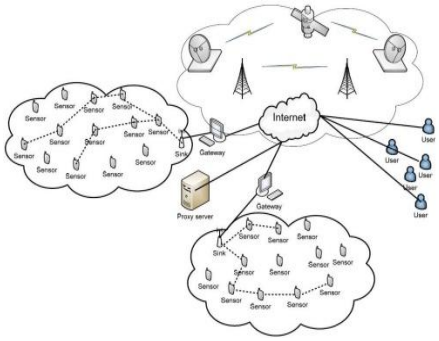

Figure1: A general architectural diagram of the Sensor Network

WSN innovation has the ability of quick capturing, processing, and transmission of basic information continuously in real-time with high resolution. WSN can be useful to disaster management in two ways. Firstly, WSNs has empowered a more helpful early warning system and secondly, WSN provides a system able to learn about the phenomena of natural disasters. WSN innovation has the ability of quick capturing, processing, and transmission of basic information continuously in real-time with high resolution.

2. RELATED WORK

2.1 Land Slide prediction and monitoring

The landslide is a critical environmental process. Such process dependably happens each year and makes misfortunes of lives and properties. So study is needed to propose a system that can help to prevent the calamitous environmental process. Landslide prediction and monitoring protocols were developed with the use of Energy efficient Sensor Networks. The Sensor Nodes are deployed in various areas which are classified into hierarchical zones. In[6] author presented Fault Tolerant Energy saving clustering scheme in WSN for Landslide Area Monitoring to reduce Communication and processing overhead.

3. EARTHQUAKE

To handle the earthquake flow, for example, very dynamical extent and variable source area, every sensor keeps up discrete factual models of recurrence range for various sizes of seismic sign vitality got by Sensor. Each sensor detects earthquake event every sampling period based on seismic frequency spectrum by the system architecture.

4. FLOOD FORECASTING

Every year surges cause loss of a great many lives and billions worth of property in India. Although all these losses cannot be eradicated fully but the losses to lives and property can be reduced to barest minimum level, if the defensive measures can be taken before the disaster has struck as glimmer surges? Floods are the most common and wide spread of all natural disasters. This can be

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

made conceivable with the assistance of correspondence innovation utilized on the top of wireless sensor systems**.** In[9] author proposed simple flood forecasting scheme using WSN which presented a forecasting model designed using WSNs to predict flood in rivers which use multiple variable robust linear regression which is easy to understand and cost effective .Implementation is speed efficient, however has low asset use but then gives constant forecasts dependable precision.

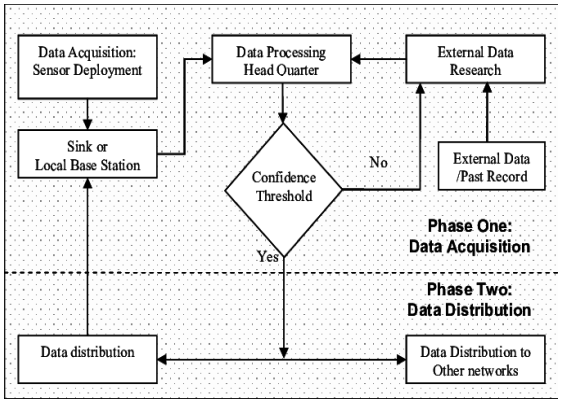

Figure2: Smart System aided with WSNs [5].

Detailed mapping that **is** required for the production of hazard assessment maps and for input to various types of hydrological models;

- Developing a larger scale view of the general flood situation within a river basin or coastal belt with the aim of identifying a immediate assistance
- Damages, in terms of properties and crops, are assessed with the help of existing land use base map.
- Flood prediction through obscuration of clouds and snow cover.

5. FOREST/RESIDENTIAL FIRE DETECTION

In spite of the fact that it is practically difficult to put off raging fires, yet the catastrophe can be turned away given the data about the site of the flame can be promptly sent to the closest control focus and sufficient measures be taken to control it, before it inundates everything.

An extensive number of Sensor Nodes are thickly sent in the backwoods. These Sensor Nodes are composed into groups so that every node has a comparing cluster header. Sensor Node can gauge environment temperature, relative mugginess and smoke. They are also assumed to know their location information by equipment's such as Global Positioning System GPS.

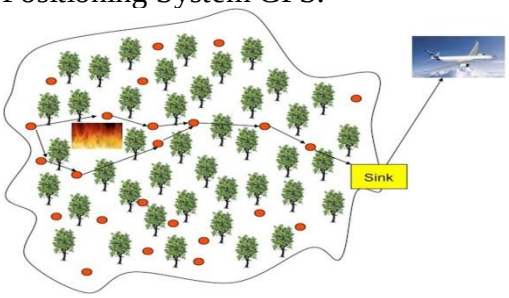

Figure3: A WSN for real-time forest fire detection

The manager node provides two sorts of information to users: (1) Emergency report for unusual occasion (e.g. smoke or to a great degree high temperature is distinguished); real-time forest fire danger rate for each cluster based on the weather indexes from the cluster header and other forest fire factors.

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

5.1 Wireless Sensor Network for Tsunami Detection

A system for tsunami detection and mitigation using a wireless ad hoc sensor network defines three types of nodes: sensor, commander, and barrier. Generally extensive number of Sensor Nodes gathers submerged pressure readings across a coastal area. This information is accounted for to authority nodes which analyses the pressure data and predict which, if any, barriers need to fire. Despite the fact that it is difficult to totally stop a tidal wave, author proposed utilizing various obstructions which might be locked in to diminish the effect of the wave. A calculation as recommended by author in has been actualized which utilizes a General Relapse Neural Network (GRNN) as endorsed to foresee the way of the wave. The GRNN analyzes the pressure data from sensor nodes and predicts which barriers should fire to most effectively impede the tsunami. It likewise utilizes a continuous reaction component for dissemination.

5.2 Wireless Sensor Network model for Drought Forecast

More watering system strategies have just about got over the issue of dry season, however like numerous other creating and under-advantaged nations, India too is reliant on downpour divine beings for the regular downpours to meet their prerequisites of water for watering system purposes. The suggested model is based on an intelligent system called Drought Forecast and Alert System (DFAS), which is a 4-tier system framework composed of Mobile Users (MUs), Ecology Monitoring Sensors (EMSs), Integrated Service Server (ISS), and Intelligent Drought Decision System (ID2SDFAS joins the remote sensor systems, inserted mixed media interchanges and neural system choice advancements to successfully accomplish the forecast and alarm of the dry season. DFAS analyzes the drought level via the proposed drought forecast model derived from the Back-Propagation Network algorithm.

5.3 Distress Net

ICS is an arrangement of rules for sorting out debacle reaction. It gives institutionalized yet adaptable mechanism to manage the development of synergistic groups fit for cross-jurisdictional coordination. ICS also provides a framework of common processes supporting integration of resources from different organizations into cohesive teams. Sensor networks have been deployed to a variety of challenging environments. ExScal and Vigil Net are two such systems. ExScal conveyed more than 1200 elements in an open air checking application with a static preplanned topology. Vigil Net, with roughly 200 nodes, utilized a static however spontaneous topology in a comparative exertion. Both activities utilized for the most part homogeneous equipment. Distress Net requires greater scalability, more heterogeneity, and higher degrees of mobility. Alarm Net is deployed in an assisted living environment, offers a heterogeneous network of static and mobile elements deployed across a confined area. Not at all like Distress Net, Alarm Net depends on altered foundation covering limited ranges. Distress net by specially appointed remote sensor system design for circumstance

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

administration in a disaster reaction. Situational mindfulness in a disaster is basic to powerful reaction. Disaster responder requires convenient conveyance of high volumes of precise information to settle on right choices. To address these issues, Distress net, that backings calamity reaction with appropriated collective detecting, topology mindful steering utilizing a multi channel convention, and precise asset limitation.

5.4 Vehicle

To acquire clearing arranges in the dynamic system, we utilized a model of departure issue and an arrangement of calculations to create dynamic clearing arranges, taking into account continuous data got from sensors and other observation innovations. Presently, in the most research writing, scientific models for clearing issues are arranged into two groups: microscopic models and macroscopic models. Microscopic models are used for experimental analyses by simulation of behaviors of individual residents. Typical such microscopic models are cellular automata simulation models an probabilistic models for pedestrians and traffic movement. While in macroscopic models, which do not directly treat the behaviors of individual evacuee but treat them as a homogeneous group, that is to say, each evacuee have the same speed and we rely on drivers' discretion to choose among multiple feasible links if giving them the right signal. There are several classes of mathematical macroscopic models such as static networks, discrete-time dynamic networks and continuous-time dynamic networks.

5.5Alert Systems

In author present WSN weather and disaster alarm systems that can be used to prevent enormous damage from natural disasters. In this frame work, Wireless sensor system in view of Zigbee /IEEE802.15.4 standard is used as climate station sending climate data and Disaster's ready. The climate data is broke down by utilizing choice tree methods to declare the disaster's ready.

CONCLUSION

This survey studies the role of sensor network in disaster management. It furthermore studied the different types of disaster management protocols and their application in extremely disastrous conditions. The performance such protocols are studied based on Energy efficiency, location awareness and network lifetime. This paper surveyed some of the research Techniques in event detection of Wireless sensor network. Comparison between the different methods of event detection is done in this paper.

REFERENCES

[1]M. Sheik Dawood, G. Athisha,"FaultTolrent Sensor Network Protocol for Disaster Management", Journal of Global Research in Computer Science, Vol. 4, No. 6, June 2013, PP.1-10.

[2] A. Arora, "ExScal: Elements of an Extreme Scale WirelessSensor Network", Proc. 11th IEEE International Conference on Embedded Real-Time Computing System Applications, Aug. 2005, pp. 102–108.

[3] T. He, "VigilNet: An Integrated Sensor Network System for Energy-Efficient

International Journal of Computer Science
Scholarly Peer Reviewed Research Journal - PRESS - OPEN ACCESS
ISSN: 2348-6600
http://www.ijcsjournal.com Volume 5, Issue 1, No 13, 2017 ISSN: 2348-6600
Reference ID: IJCS-216 PAGE NO: 1348-1353
Sri Vasavi College, Erode Self-Finance Wing 3rd February 2017
National Conference on Computer and Communication NCCC'17
http://www.srivasavi.ac.in/ nccc2017@gmail.com

Surveillance", ACM Transaction Sensor Network, vol. 2, no. 1, 2006, pp. 1–38.
[4] A. Wood, "Context-Aware Wireless Sensor Networks for Assisted Living and Residential Monitoring", IEEE Network, vol. 22, no. 4, July 2008, pp. 26–33.
[5] Harminder Kaur, Ravinder Singh Sawhney, Navita Komal, "Wireless Sensor Networks for Disaster Management",International Journal of Advanced Research in Computer Engineering & Technology Volume 1, Issue 5, July 2012.
[6] Rehna Raj, Maneesha Ramesh, V. And Sangeeth Kumar, "Fault Tolerant Clustering Approaches in
WSN for Landslide Area Monitoring",Proceedings of the International Conference on Wireless Networks (ICWN'08), Vol. 1, 2008, pp. 107–113.
[7] KalyanaTejaswi, Prakshep Mehta, Rajat Bansal, Chandresh Parekh,S. N. Merchant and U. B. Desai, "Routing Protocols for Landslide Prediction using Wireless Sensor Networks", proceedings of fourth International Conference on Intelligent Sensing and Information Processing (ICISIP 2006),2006,pp.43-47.
[8] Alberto Rosi, Nicola Bicocchi, Gabriella Castelli, Marco Mamei, Franco Zambonelli, "Landslide Monitoring with Sensor network", International journal of signal and imaging systems engineering, Vol. 10, no. 3, 2011.
[9]. SitiKhairunnizaBejo, Abdul Rashid Mohamed Shariff, "Historical Analysis of the Land Movement in Landslide Area Using Elastic Image Registration and Conditional Statement approach", International
Journal of Multimedia and Ubiquitous Engineering, Vol. 6, no. 3, 2011.
[10] M. Sheik Dawood, SajinSalim, S. Sadasivam, G. Athisha, "Energy Efficient Modulation Techniques for Fault Tolerant Two-Tiered Wireless Sensor Networks", Journal of Asian scientific