

Wan Based Marine Environment Monitoring and Communication System

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ABSTRACT

During the last decades, marine environment monitoring has become a priority because of the uncontrollable human activities which gradually are destroying the marine environment. So, the usage of information technologies has been considered as a feasible alternative for monitoring marine environments. This proposes GeoSoc a cross layer communication protocol using information cross-layer from MAC sublayer and Application sublayer to create groups of collaboration for monitoring of marine currents. Results obtained from simulations showed that GeoSoc is a suitable protocol for data transmissions in WSN applied on marine environment. The Marine Environment is a vulnerable ecosystem human activities such as urban development, tourist and industrial development on the coasts and the circulation of marine transport prone to accidents and therefore to spills of chemical substances.

Keywords : Wan Based Marine Environment Monitoring, GeoSoc, WSN, Wireless Sensor Networks

I. INTRODUCTION

The main aim of the project is to monitor the marine environment using Zigbee. GeoSoc is a cross-layer protocol that makes hierarchical use of geopositioning for the control of groups of collaboration commonly called clusters. The clusters are maintained by a “table cluster” containing relevant information for operation which is updated

periodically. With in GeoSoc a node can take one of the following states. Cross-layer architecture of GeoSoc is a communication protocol cross-layer located in the application layer that is complemented with information collected by the data link layer for management manage clusters. The advantages of cross-layer design are to reduce delays and loss packages

II. LITERATURE SURVEY

S.no	Publication Title	Author name	Advantages	Disadvantages
1	“Computational Intelligence in Wireless Sensor Networks”, IEEE Communications Surveys &	Raghavendra, V. Kulkarni ,Anna Forster ,Ganesh Kumar Venayagamoorthy	It uses CI techniques to address WSN issues. There are numerous successful applications of adaptive critic designs	The main problem is that the most of these algorithms or protocols are still in development stage. They may remain forever in non-finalized

	<u>Tutorials</u> ,2011		in power systems.	state.
2	“Undersea wireless sensor network for ocean pollution prevention” , <u>3rd International Conference on</u> 6-10 Jan. 2008	Arjith Khan, Lawrence Jenkins	It prefer short-range acoustic communication. The novel node synchronization protocol is used for uniform battery usage .	The marine environment monitoring is difficult and costly for humans.
3	“Research Issues in Wireless Sensor Network Applications: A Survey”, <i>International Journal of Information and Electronics Engineering</i> , Vol. 2, No. 5, September 2012	Edwin Prem Kumar Gilbert, Baskaran Kaliaperumal, Elijah Blessing Rajsingh	The water quality can be monitored by this system. It have found application such as object detection and tracking.	It requires high detection probability, low false alarm rate and bounded detection delay which all are difficult to attain.
4	“Experimental Analysis of a Wireless Sensor Network in a Multi-Chamber Metal Environment” , <u>22th European Wireless Conference</u> ; 2016	David Rojas, John Barret.	It is used to classify the links reliability, asymmetry, and sink candidates, and to analyse the behaviour of the network at a high level of 3D detail.	There is a concern in accurately modelling these metallic environments .
5	“Sensor Networking in Aquatic Environments - Experiences and New Challenges” , <u>32nd IEEE Conference on</u> 15-18 Oct. 2007	Thiemo Voigt , Fredrik Osterlind , Niclas Finne, Nicolas Tsiftes , Zhitao He , Joakim Eriksson , Adam Dunkels , Ulf Bamstedt , Jochen Schiller , Klas Hjort .	The underwater communication makes it possible to comprise moving objects . It is used for the design of an advanced low-cost buoy system.	A large number of buoys is required for more intensive monitoring of aquatic areas. The other issues are anti-theft alarm and theft prevention.
6	“Spectral Analysis of Forest Fire Noise for Early Detection using Wireless Sensor Networks” , <u>International Siberian Conference</u> 2016	Khamukhin.A.A, Bertoldo.S .	It is used to analyze the noise power spectrum of forest fires.	The Crown fires are extremely dangerous and it is very difficult to fight. It can spread at rate over 100 times more than a surface fire.

7	“Development of WSN system for precision agriculture”, <u>International Conference on</u> 19-20 March 2015	Santoshkumar, Udaykumar.R.Y .	The precision agriculture requires low cost WSN system.	The continuous monitoring and controlling is intensive and it is technically challenging
8	“Preliminary design for crop monitoring involving water and fertilizer conservation using wireless sensor networks”, 3rd International Conference on Communication Software and Networks, 27-29 May 2011	Vijayakumar.S , Rosario.J.N .	The water is spingled in a proper way, so the water is conserved. The amount of fertilizer can be reduced.	The sensor motes requires several external sensors namely leaf wetness, soil moisture, soil pH, atmospheric pressure sensors attached to it.
9	“Graph Neuron based approach to smart roads solutions using Wireless Sensor Networks”, In Fourth congress on Information and communication technologies (pp. 275–279). 8-11 Dec. 2014	Welikhe.V , Vaidhyashankar.J , Hudaya.A , Amin.M .	It is implemented for a road safety traffic support system being deployed at black-spots with a high likelihood of motor accidents. It has the ability for the network to effectively differentiate between event and non-event is instrumental in the classification process.	There will be dire consequences ,if there is a failure to yield higher priority traffic, for any reason.
10	“Improving emergency messages transmission delay in road monitoring based WSNs”, Proceedings of 2013 6th Joint IFIP Wireless and Mobile Networking Conference, WMNC 2013.	Brahmi.H.I , Djahel.S , Murphy.J .	It leads to more efficient reaction to the emergency situation. Thus, cars collision and human lives loss as well as road traffic jam will be mitigated.	The real challenge is ensuring low transmission delay from the detector sensor to WSNs gateway .

11	“Underwater sensor networks, oceanography and plankton assemblages”, 3rd International Conference on, 3-6 dec. 2007.	Olga Bondarenko , Stuart Kininmonth , Michael Kingsford	The temperature data is communicated through real time using RF signal to the on-shore base station.	The great barrier reef is affected by cold water intrusions originating in the Coral Sea and upwelled on the reef.
12	“A realistic experiment of a wireless sensor network on board a vessel”, 2012 9th International Conference on Communications, COMM , 21-23 June 2012	Kdouh.H , Brousseau.C , Zaharia.G , Grunfeleder.G , Zein.G.El .	Few works have treated the use of this technology in the particular metallic shipboard environment. The deployment of a WSN on board a ferry-type boat during realistic conditions. The network was tested during sailings and stopovers for several days	The metallic structure of ferries and the dynamic movement of crew and passengers on board may affect it.
13	“Wireless Sensor Networks for Environmental Research: A Survey on Limitations and Challenges”, EuroCon , 267–274. 1-4 July 2013	De La Piedra.A , Benitez-capistros.F , Dominguez.F , Touhafi. A .	It provides a number of advantages to ecoinformatics .It can be used for ecological and process modelling.	It limits on the identification of limitations and open problems.
14	“ G. Group-based Underwater Wireless Sensor Network for Marine Fish Farms”, In Proceedings of the 2011 IEEE GLOBECOM Workshops, Houston, TX, USA, 5–9 December 2011; pp. 115–119.	Jaime Lloret, Sandra Sendra, Miguel Garcia ,Gines Lloret.	It provides low cost maintenance. This can be used to simulate several parts such as the bed shear stress, and the waste distribution.	Sensors are limited in large space and the mobility of the nodes are difficult to handle.
15	“Wireless Sensor Network for Localized Maritime Monitoring”, In Proceedings of the 22nd International Conference on Advanced Information Networking and Applications, 25–28 March 2008; pp. 681–686.	Pedro N.E.S. Barbosa, Neil M. White, Nick R. Harris	It is used to improve communication where scalable mobile networks are optimized by taking into consideration a weight function.It is used to improve wide area communication, amplified transmitters.	The transmission requires more power than reception route distance to sink.

III. CONCLUSION

Thus, it presents a state-of-the-art survey of applications of wireless sensor networks in marine environment monitoring. It first describes fundamentals of WSNs-based marine environment monitoring and then reviews the related literature. From this survey, it is evident that there are still a few interesting challenges and opportunities on development and deployment of wireless sensor networks for marine environment monitoring, including oceanographic sensors protection, advanced buoy design, energy harvesting system design, and system stability and reliability.

IV. FUTURE WORK

For future work, we plan to investigate how to generate better performance. We will also try to apply WSN on other problems related in marine environment.

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