Sample report on the usage of wireless sensor network in er

Business, Management

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INTRODUCTION

The need for a ubiquitous world where small computing devices are scattered to collect real time data and information especially in the delivery of healthcare is what motivates the development of wireless sensor networks. Wireless sensor networks are networks developed from pieces of small size sensors referred to as nodes. The nodes can cover a small radius the size of a room to a large geographical area such as a country.

These networks have been beneficial in the tracking and management of healthcare facilities assets and lately patients. A sensor node attached to a mobile hospital asset or a patient provides real time data such as location at a specific instance as well as physiological values such as temperature, humidity among others. Sensor nodes are characterized by their self-organizational capability to achieve a seamless communication between themselves without people intervention. This feature has made it possible to develop WSN for tracking hospital assets and monitoring patients in healthcare facilities.

WSN has been utilized world over to automate and manage different

scenarios and applications. For instance, WSN has been deployed in traffic management, environmental monitoring, structural health monitoring, and importantly in healthcare for patient monitoring in clinical and disaster scenes. Examples of these medical WSN are CodeBlue and MEDiSN.

Experiment and analysis

The development of WSN requires input from patient, medical personnel, and stuff. Data collection processes in form of interviews are conducted with medical staff of different institutions. In our case, WSN-based medical app was designed in collaboration with Henri Mondor University Hospital Center in Creteil, France, while an asset tracking application was developed with input from Gil Medical Center Korea. In overall, the following requirements were noted for the two systems: ease of use, mobility, reliability, security, common standard of operation- 802. 15. 4, quality of service, adaptability and scalability.

The system architecture comprises of mobile nodes, the application. The WSN-enabled application is made up of application server and the multiple application clients. IN the WSN-based medical app, multiple application clients are represented by the motes while the server is equated to the base station.

Results indicate that the distances between the application motes and the base station/server, signal range and the node mobility affects the performance of the WSN.

The routing topology of WSN-based applications is independent. Nodes discover their routes independently based on the nearest route available

such that the extinction of some nodes does not affect the operations of the others.

The individual nodes are managed from an application client made up of a friendly user interface. The user interface displays the entire location of the hospital facility and the specific location of the nodes. This way, hospital stuff can manage the assets and monitor the patient’s physiological conditions without necessarily getting near the patient. It also improves management and scheduling of operation rooms Intensive Care Units and theatres.

Conclusions

The two applications have shown that medical facilities can be better managed using WSN’s given their characteristic easy deployment, automatic route rediscovery and self healing. Sensor networks indicate the location of assets/patients at any given time while middleware abstracts the location through the coordinate system or otherwise. The nurses, doctors/ hospital management can easily trace and determine the location and state of the assets/ patient through the user friendly interface.

Works Cited

Kwangsoo Kim, Jongarm Jun, Sunjoong Kim, and Byung Y. Sung. " Medical Asset Tracking Application with Wireless Sensor Networks." The Second International Conference on Sensor Technologies and Application. 2008.

Nouha SGHAIER, Abdelhamid MELLOUK, Brice AUGUSTIN, Yacine AMIRAT, Jean MARTY, Mohamed El Amine KHOUSSA, Amine ABID, Rafik ZITOUNI. " Wireless Sensor Networks for medical care services." 2011.