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Routing Protocols in Wireless Sensor Networks – A Survey

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Abstract

Advances in wireless sensor network (WSN) technology has provided the availability of small and low-cost sensor nodes with capability of sensing various types of physical and environmental conditions, data processing, and wireless communication. Variety of sensing capabilities results in profusion of application areas. However, the characteristics of wireless sensor networks require more effective methods for data forwarding and processing. In WSN, the sensor nodes have a limited transmission range, and their processing and storage capabilities, as well as their energy resources, are also limited. Routing protocols for wireless sensor networks are responsible for maintaining the routes in the network and have to ensure reliable multi-hop communication under these conditions. In this paper, we give a survey of routing protocols for Wireless Sensor Network and compare their strengths and limitations.

Keywords

Wireless Sensor Networks, Routing Protocols, Cluster Head

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Computer-Aided Diagnosis of Thyroid Nodule: A Review

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ABSTRACT

Diagnostic imaging is an important tool in medical science due to the constrained observations of the expert and uncertainties in medical knowledge. A thyroid ultrasound is a non-invasive imaging study used to detect and classify abnormalities of the thyroid gland. Computerized system is a valuable and beneficial means for feature extraction and classification of thyroid nodule in order to eliminate operator dependency and to improve the diagnostic accuracy. The aim of this paper is to review existing approaches to the automatic classification of nodules in thyroid ultrasound images, highlighting the keypoints and main differences between the used strategies. The aim of this paper is to review existing approaches for the diagnosis of Nodules in thyroid ultrasound images with their performance measures.

KEYWORDS

Thyroid Gland, Nodule, TIRADS, Ultrasound Images, Computer-Aided Diagnosis, Feature Extraction, Classification.

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Probabilistic Broadcasting Protocol In AD-HOC Network And Its Advancement: A Review

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ABSTRACT

Broadcasting is a fundamental operation in MANETs where a source node transmits a message that is to be disseminated to all the nodes in the network. Broadcasting is categorized into deterministic and probabilistic schemes. This paper reviews the probabilistic broadcasting protocol because of its adaptability in changing environment. Probabilistic broadcasting is best suited in terms of ad hoc network which is well known for its decentralized network nature. Probability, counter and distance based scheme under probabilistic scheme are discussed in this paper. Besides the basic probability scheme this paper also includes their recent advancements. Rebroadcast is one of the initial task for route discovery in reactive protocols. This review paper identify which protocol gives better performance in terms of reachability, saved rebroadcast and average latency in rebroadcasting a route request message. Simulation results are presented, which shows reachability, saved rebroadcast and average latency of the probabilistic broadcast protocols and their enhancement schemes. The comparative study shows the improvement of enhanced scheme over probabilistic schemes.

KEYWORDS

Probabilistic broadcasting, Probability-based scheme, Counter based scheme, Distance based scheme, Reachability, Saved Rebroadcast.

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SECURE AND RELIABLE ROUTING IN MOBILE ADHOC NETWORKS

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ABSTRACT

The growing diffusion of wireless-enabled portable devices and the recent advances in Mobile Ad-hoc NETWORKS (MANETs) open new scenarios where users can benefit from anywhere and at any time for impromptu collaboration. However, energy constrained nodes, low channel bandwidth, node mobility, high channel error rates, channel variability and packet loss are some of the limitations of MANETs. MANETs presents also security challenges. These networks are prone to malicious users attack because any device within the frequency range can get access to the MANET. There is a need for security mechanisms aware of these challenges. Thus, this work aims to provide a secure MANET by changing the frequency of data transmission. This security approach was tested, and the results shows an interesting decreased of through put from malicious node when the number of frequency used is increased, that way the MANET will not waste it's resources treating malicious packets. The other contribution of this work is a mobility aware routing approach, which aims to provide a more reliable routing by handling effectively the nodes mobility.

KEYWORDS

Security, Reliability, Mobile Ad-hoc Networks (MANETs), Routing protocols.

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A Survey Of Sql Injection Countermeasures

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Abstract

SQL injection has become a predominant type of attacks that target web applications. It allows attackers to obtain unauthorized access to the back-end database to change the intended application-generated SQL queries. Researchers have proposed various solutions to address SQL injection problems. However, many of them have limitations and often cannot address all kinds of injection problems. What's more, new types of SQL injection attacks have arisen over the years. To better counter these attacks, identifying and understanding existing countermeasures are very important. In this research , I had surveyed existing techniques against SQL injection attacks and analyzed their advantages and disadvantages. In addition, I identified techniques for building secure systems and applied them to my applications and database system and illustrated how they were performed and the effect of them.

Keywords

SQL injection attacks, Database, Authentication Bypass, Secure Systems

More Details:<http://airccse.org/journal/ijcses/papers/3312ijcses05.pdf>

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A SURVEY OF REAL-TIME ROUTING PROTOCOLS FOR WIRELESS SENSOR NETWORKS

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ABSTRACT

Sensor networks is an interdisciplinary research area that draws on contributions from signal processing, wireless networking and associated routing protocols, database management and information systems, distributed algorithms and MEMS technology. Recent developments in Wireless Sensor Networks have resulted in wide variety of real-time applications. Many real-time routing protocols are designed to meet the requirements of these applications where timely delivery of the sensed information is given the top priority. This paper presents the comparative analysis of various existing real-time routing protocols for wireless sensor networks, which emphasizes on various factors like end-to-end delay, energy, mobility, scalability and highlighted various challenges for future research.

KEYWORDS

Wireless Sensor Networks (WSNs), Micro-Electro-Mechanical Systems (MEMS), Real-time routing (RT), Routing protocols (RPs), QoS, Deadline miss ratio (DMR), Energy consumption, Void avoidance, end-to end delay

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Analysis Of Recent Checkpointing Techniques For Mobile Computing Systems

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Abstract

Recovery from transient failures is one of the prime issues in the context of distributed systems. These systems demand to have transparent yet efficient techniques to achieve the same. Check point is defined as a designated place in a program where normal processing of a system is interrupted to preserve the status information. Checkpointing is a process of saving status information. Mobile computing systems often suffer from high failure rates that are transient and independent in nature. To add reliability and high availability to such distributed systems, checkpoint-based rollback recovery is one of the widely used techniques for applications such as scientific computing, database, telecommunication applications and mission-critical applications. This paper surveys the algorithms which have been reported in the literature for checkpointing in Mobile Computing Systems.

Keywords

Mobile computing systems, Co-ordinated checkpoint, rollback recovery, mobile host.

More Details:<http://airccse.org/journal/ijcses/papers/0811cses10.pdf>

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Firewall and VPN Investigation on Cloud Computing Performance

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ABSTRACT

The paper presents the way to provide the security to one of the recent development in computing, cloud computing. The main interest is to investigate the impact of using Virtual Private Network VPN together with firewall on cloud computing performance. Therefore, computer modeling and simulation of cloud computing with OPNET modular simulator has been conducted for the cases of cloud computing with and without VPN and firewall. To achieve clear idea on these impacts, the simulation considers different scenarios and different form application traffic applied. Simulation results showing throughput, delay, servers traffic sent and received have been collected and presented. The results clearly show that there is impact in throughput and delay through the use of VPN and firewall. The impact on throughput is higher than that on the delay. Furthermore, the impact show that the email traffic is more affected than web traffic.

KEYWORDS

VPN, firewall, cloud, computing, OPNET

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Study on the Path Tracking and Positioning Method of Wheeled Mobile Robot

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ABSTRACT

As a kind of wheeled mobile robot used in intelligent logistics system, AGV is mainly used for automatic material transportation, the precise positioning and path tracking is the assurance of accurate material transportation. In this article, the laser coordinate positioning technology is used to realize accurate positioning for AGV, a new method of target reference point selection is put forward, and path tracking is implemented in combination with the kinematics model of single steering wheel AGV, the objective function that AGV successfully reaches the destination accurately according to the preset trajectory is completed finally. The study is in trial stage, and obtains good operation effectiveness.

KEYWORDS

Wheeled Mobile Robot, Laser Positioning, Path Tracking, Kinematics Model.

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QoS aware Hierarchical Multi-hop Routing Protocols in MANETs

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ABSTRACT

Ad hoc wireless networks are multi-hop networks that are dynamic, and are formed by a group of nodes which are mobile in nature, on a shared wireless links. Mobile ad hoc network (MANET) is a collection of autonomous nodes that communicate with each other by forming a multi hop radio network. The analysis and design of routing protocols is a significant issue in ad-hoc wireless networks. Since the previously proposed routing algorithms have not considered the multi-hop flow with an end-to-end scenario, and had shown to perform well in providing blond sharing of bandwidths among the single-hop wireless flow. Compared to host- based routing, Hierarchical Multi-hop routing significantly reduces the routing table sizes and the amount of routing related signalling traffic, at the expense of reducing path efficiency and generating some management traffic. This paper focuses on QoS aware Hierarchical Multi-hop routing schemes for mobile ad hoc networks. The best path from a source to a destination is calculated using the QoS information available with either group heads or with each member. Separate clusters are created using the cluster creation algorithm. Depending on the QoS information available with each gateway node, packets are routed. Because of the hierarchical architecture, the performance is unaffected by the increase in the number of mobile nodes, at the same time the Packet Loss is reduced. The proposed dynamic clustering algorithm manages the handover dynamically and hence the efficiency is not degraded by node mobility.

KEYWORDS

Mobile ad hoc network, MANET, Quality of Service, QoS enabled Routing, FQMM, Dynamic Cluster Creation Algorithm

More Details:<http://airccse.org/journal/ijcses/papers/4113ijcses03.pdf>

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