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COMPARATIVE PERFORMANCE INVESTIGATION OF EIGRP, OSPF, AND RIP ROUTING PROTOCOL FOR CAMPUS AREA NETWORK USING CISCO PACKET TRACERAND OPNET MODELER

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ABSTRACT

A routing methodology is needed to incorporate in a whole computer system with greater network facility. Routing protocols play a crucial role in modern communication networks. They facilitate the network topology information among nearby routers. Network managers have to analyze the effectiveness of various routing protocols using different criteria. The efficient functioning of a Campus Area Network (CAN) heavily relies on the selection of an appropriate routing protocol. This study conducts a comparative performance investigation of three popular routing protocols, namely Enhanced Interior Gateway Routing Protocol (EIGRP), Open Shortest Path First (OSPF), and Routing Information Protocol (RIP), using two simulation tools, Cisco Packet Tracer and OPNET Modeler. The objective of this investigation is to evaluate and compare the key performance metrics of these routing protocols in a CAN environment, including convergence time, routing table size, network stability, and overall throughput. The simulations are conducted under various scenarios and network configurations, simulating real-world situations that a campus network might encounter. Through the comprehensive analysis of the obtained simulation results, this study aims to identify the strengths and weaknesses of each routing protocol, enabling network administrators and engineers to make informed decisions when choosing the most suitable routing protocol for their specific CAN requirements. The findings of this investigation contribute to the existing body of knowledge in the field of computer networks and routing protocols, providing valuable insights for network designers, administrators, and researchers. Furthermore, the comparison of simulation results from two different tools, Cisco Packet Tracer and OPNET Modeler, offers an additional perspective on the consistency and accuracy of the outcomes. The outcomes of this research serve as a reference for future network design and optimization endeavors, aiding in the enhancement of the overall performance and reliability of campus area networks.

KEYWORDS

Routing Protocol, EIGRP, OSPF, RIP, Packet Tracer, OPNET & Cisco Packet Tracer

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CUBOID-BASED WIRELESS SENSOR NETWORK LOCALIZATION ALGORITHM

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ABSTRACT

Localization is one of the key technologies in wireless sensor networks (WSNs), since it provides fundamental support for many location-aware protocols and applications. Constraints on cost and power consumption make it infeasible to equip each sensor node in the network with a global position system (GPS) unit, especially for large-scale WSNs. A promising method to localize unknown nodes is to use anchor nodes, which are equipped with GPS units among unknown nodes and broadcast their current locations to help nearby unknown nodes with localization. In this paper we can proposed a novel algorithm of cuboid localization with the help of central point precision method. Simulation shows that the results are far better then existing cuboid methods and gain accuracy of up to 83% with a localization error of 1.6m and standard deviation of 2.7

KEYWORDS

Network Protocols, Wireless Network, Mobile Network, Virus, Localization

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IOT-WSN: SURVEY ON POSITIONING TECHNIQUES

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ABSTRACT

Recent advances in radio and embedded systems for completing the procedure of location estimation most of the time sensor networks are fully dependent on the distance measurements that is present between the sensor neighbourhood node. Techniques used for the localization can be categorized differently. Techniques used for the measurement of the distance between the wireless sensor nodes, dependent upon the physical means are divided into three broader categories namely Received signal strength (RSS), Angle of Arrival (AOA) and propagation base on time measurements. This paper discusses the most of the approached of WSN and IoT based positioning system.

KEYWORDS

Wireless sensor network, RSSI, Mobile computing, IoT, Anchors, Beacons.

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WIRELESS SENSOR NETWORK LOCALIZATION IN 3D USING STEERABLE ANCHORS' ANTENNAS

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ABSTRACT

Wireless sensor network localization plays an important role in mobile computing. Moreover, Sensor nodes are often deployed non-uniformly in anisotropic WSNs with holes in various applications such as monitoring area terrain. The existence of holes will invariably affect the Euclidean distances between nodes and result in low accuracy of node localization. The proposed algorithm is suitable for four different topologies, including the semi-C-shape topology, the O-shape topology, the multiple O-shape topology and the concave-shape topology and is exceedingly accurate and efficient comparing with state-of-the-art methods in anisotropic WSNs with holes. Our results show that the error in horizontal plane is less than 0.25 m while in the Z-axis is less than 0.5 m.

KEYWORDS

Antenna, wireless network, Mobile Network, RSSI, Localization

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DEVELOPMENT OF SOM NEURAL NETWORK BASED ENERGY EFFICIENT CLUSTERING HIERARCHICAL PROTOCOL FOR WIRELESS SENSOR NETWORK

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ABSTRACT

Cluster-Based Routing Protocols is a renowned scheme to extend the lifetime and energy consumption simultaneously for the Wireless Sensor Network (WSN). Every sensor node work homogenously or heterogeneously which is energy constrained when energy and memory capacity is limited. Congregating information resourcefully in perilous situations in the sensor network for a large-scale area and huge time is required an effectual protocol. In this paper, we proposed a cluster-based hierarchical routing path protocol, namely SOM-PEG protocol, which is a modified PEGASIS protocol based on traditional PEGASIS with the employment of Self Organizing Map (SOM) neural network (NN). The simulation is performed on MATLAB simulation tool as well as NN GUI. The performance comparison shows that the proposed protocol provides better network lifetime and ensures less energy consumption compared with traditional PEGASIS protocol.

KEYWORDS

WSN, PEGASIS, SOM-PEG, NN GUI, SOM, Energy consumption, Lifetime

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INVESTIGATION OF THE PERFORMANCE OF CONTENT-BASED OPPORTUNISTIC ROUTING PROTOCOL IN DTN: A COMPARATIVE STUDY

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ABSTRACT

Delay Tolerant Network (DTN) is one kind of emerging networks characterized by long delay and intermittent connectivity. Therefore, network environments where the nodes are characterized by opportunistic connectivity are appropriately modeled as Delay-Tolerant Networks (DTN). Traditional ad hoc routing protocols are inapplicable in DTNs because nodes are seldom fully connected. In recent years, many routing protocols are proposed to improve the performance matrix in DTN. In this paper, we have observed the performance of social aware DTN routing protocols, namely Social-aware Contentbased Opportunistic Routing Protocol (SCORP), Daily Routine Based (dLife), and Community Based dLife (dLifeComm) in an ICMN scenario. Their performances are analyzed in terms of delivery probability, average latency, and overhead ratio for varying the number of nodes per group, TTL (time to live) and simulation time respectively. Opportunistic Network Environment (ONE) simulator is used as the simulation tool for evaluating these performance metrics. The result of this investigation shows that for the ICMN scenario, SCORP exhibits best performance whereas dLife the worst in terms of all the metrics considered here.

KEYWORDS

Delay-tolerant network (DTN,) intermittently connected mobile network (ICMN), opportunistic network environment (ONE) simulator, SCORP, dLife, dLifeComm, routing, simulation

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ADVANTAGES AND LIMITS OF FREE SPACE OPTICS

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ABSTRACT

Free space optics known as (FSO) is very popular now days this is because of increased demand for cheaper, faster and most important affordable internet. So many research scientists have taken the great interest in this field. FSO uses laser for transmitting data at the speed capable of reaching 2.5 Gbps through the air. And its systems use invisible infrared laser light wavelengths in the 780 nm to 1600 nm range. This article explains the FSO security, the transmission characteristics and also its challenges; although Free Space Optic systems can be a better solution for the needs of some broadband networking, there are limitations of bad climatic conditions that influence its performance such as fog, snow and too much rain can shut down the network. The performance of FSO is measured by Bit Error Rates (BER).

KEYWORDS

(FSO) Free Space optics, laser, transmission, Atmospheric turbulence and Scintillation.

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CLUSTERING-BASED ROUTING FOR WIRELESS SENSOR NETWORKS IN SMART GRID ENVIRONMENT

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ABSTRACT

Wireless Sensor Networks (WSN) is widely deployed in different fields of applications of smart grid to provide reliable monitoring and controlling of the electric power grid. The objective of this paper is simulate and analyze impact of various smart grid environments on performance of four different WSN routing protocols namely the Low Energy Adaptive Clustering Hierarchy (LEACH) and Centralized LEACH (LEACT-C) as well as other two conventional protocols namely Minimum Transmission Energy (MTE) and Static Clustering. This analysis would be beneficial in making the correct choice of WSN routing protocols for various smart grid applications. The performance of the four protocols is simulated using NS-2 network simulation on Ubuntu. The results are analyzed and compared using number of data signals received at base station, energy consumption, and network lifetime as performance metrics. The results show that the performance of various protocols in the smart grid environments have deteriorated due log normal channel characteristics and consequently network lifetime have decreased significantly. The results also indicate that clustering based routing protocols have more advantageous over conventional protocols; MTE and static clustering. Also, centralized clustering approach is more effective as it distributes energy dissipation evenly throughout the sensor nodes which reduce energy consumption and prolong the networks' lifetime. This approach is more effective in delivering data to base station because it has global knowledge of the location and energy of all the nodes in the network.

KEYWORDS

Wireless Sensor Networks; Clustering; Energy Consumption, Network Lifetime.

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AN INTELLIGENT REAL-TIME WIRELESS SENSOR NETWORK TRACKING SYSTEM FOR MONITORING RHINOS AND ELEPHANTS IN TANZANIA NATIONAL PARKS: A REVIEW

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ABSTRACT

The advancement of wireless sensor networks yields a variety of wireless sensor network for wildlife tracking. One typical application for wireless sensor networks is in animal tracking and monitoring in wildlife environments. A significant number of studies have been done in tracking animals with sensor networks. However from the recent literature it is observed that there is no much study has been done on an intelligent real time sensor network that is capable to alerting the rangers an incidence of animal poaching before it happened. In this paper an intelligent wireless sensor system for tracking and monitoring rhinos and elephants is proposed.

KEYWORDS

Wireless sensor network, poaching, rhinos, elephants, monitoring, tracking

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OPTIMAL CLUSTERING AND ROUTING FOR WIRELESS SENSOR NETWORK BASED ON CUCKOO SEARCH

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ABSTRACT

In this research work, the egg laying radius of cuckoo search algorithm is used to create a cluster and then search for the optimum node based on multiobjective genetic algorithm with pareto ranking, so that the data can be forwarded to the sink.The primary focus is onthe two performance metrics parameters,one is the maximization of network lifetime and other is the minimization of delay. For maximizing the network lifetime parameter, the overlapped target sensing by many sensors is wastage of energy by two or more sensors, where the same task can be done by one sensor. To overcome this problem, the sequence set cover methodology is used.For minimization of delay parameter, the sleep-wake scheduling mechanism will be considered, but substantial delays are introduced as transmitting node needs to wait for its next-hop relay node to wake up. These delays can be taken care by developing any cast based packet forwarding schemes where individual node forwards a packet to the first neighboring node that wakes up among multiple candidate nodes. This any cast forwarding schemes minimizes the expected packet-delivery delays from the sensor nodes to the sink node. The introduced work will perform energy proficient routing with an objective to improve the network life, packet loss ratio and overall network throughput. The proposed algorithm was simulated in MATLAB and compared with LEACH algorithm. The results show that our proposed algorithm issuperiorfor prolonging the network lifetime, minimizing the packet loss and increasing the throughput.

KEYWORDS

Wireless Sensor Network, Energy Efficient Routing, Cuckoo Search, Pareto ranking, Multi-objective Genetic Algorithm,any cast, sleep–wake scheduling.

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