Everything: An Augmented Reality App for Daily Purpose

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Abstract:

EVERYTHING**:** An Augmented Reality App for Daily Purpose is a project Based upon Augmented Reality that is the integration of digital information with the user's environment in real time. Augmented reality is a technology that allows your phone to mix real-world surroundings with what's being shown on screen using the device's camera. Everything project can be used for many purposes which in turn helps in making life easier. It can detect objects and translate text from any language to your native language in any image shown by camera feed in real time. This project can also be used for education purposes. With the help of Everything project we can place 3D Models/Videos/Texts on an image target which makes learning easy, interactive and interesting.
This project was developed using Unity 3d, Vuforia, C# and Google Cloud Platform (Google Cloud Vision API and Google Cloud Translation API).

Keywords*: Augmented Reality; Virtual Reality; Real Time Environmen*

Autonomous Real Time Security System

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Abstract:

This is the report for the project "Autonomous Real Time Security System "developed by Anurag Nain, Aditya Bhardwaj and Roshan Kumar Jha, final year students of Bachelor of Technology in Computer Science Engineering and Electronics and Communications Engineering at Maharaja Agrasen Institute of Technology, Delhi. The idea is to provide security from theft, fire and gas leakage in real time. To prevent theft we are building a product which senses the presence of people using PIR sensor. Whenever a user leaves his/her house alone then that person can switch on the security mode of our device so that it only works when the user has enabled the security. Now when any theft is detected then a real-time notification is sent using GSM module to the user that someone is there in the house. The user can then call police immediately or if auto-notification feature of our device is switched on then it can notify the nearest police station about the burglary by messaging the address stored by the user and thus police can send a PCR vehicle to that location in order to catch the thieves red-handed. Similarly using the temperature sensor and gas sensor, notification of fire or gas leakage can be sent. A conventional security system uses CCTV camera which generates recordings as output whose continuous monitoring cannot be possible. The innovativeness in our solution is that (a) uses sensors rather than camera to provide security in real time by sending notifications. (b) battery power facility (c) portable device (d) better performance than CCTV as sensors consumes less power.

E^2R^2: ENERGY-EFFICIENT AND RELIABLE ROUTING FOR WIRELESS SENSOR NETWORKS

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Abstract:

Wireless sensor networks (WSNs) have various applications such as tracking, monitoring of habitat, battlefield surveillance, home automation and many others.WSN have dynamic environment, limited power, memory and energy as they are battery operated and recharge of battery is not supported. Thus to build a simple, scalable and efficient routing protocol is a challenging task.

WSNs are resource constrained. Energy is the most vital assets in such systems. In this way, ideal utilization of energy is important. In this project, we have presented novel energy-efficient routing protocols for terrestrial, underwater and mobile wireless sensor networks. For terrestrial, we have used type-2 fuzzy logic model for cluster head election and compared its performance with type-1 fuzzy logic model. For underwater, to overcome limitations of acoustic channels we have compared localization free routing protocols i.e. DBR, H2-DAB and EE-DBR. For mobile, we have compared the performance of AOMDV and AODV.

1. Terrestrial Wireless Sensor Network

Energy Efficient Clustering Algorithm for Wireless Sensor Network Using Type-2 Fuzzy Logic

Clustering algorithms are used in wireless sensor network to improve network scalability, minimize energy consumption, and achieve prolonged network lifetime. However, most of the clustering algorithms overburden the cluster head (CH) during cluster formation. To overcome this problem, many researchers have come up with the idea of fuzzy logic (FL), which is applied in WSN for decision making. These algorithms focus on the efficiency of CH, which could be adoptive, flexible, and intelligent enough to distribute the load among the sensor nodes that can enhance the network lifetime. But unfortunately, most of the algorithms use type-1 FL (T1FL) model. In this project, we have used type-2 FL model, which handles uncertain level decision better than T1FL model.

2. Underwater Wireless Sensor Network

Comparison of Localization Free Routing Protocols in Underwater Wireless Sensor Networks

UWSN is used for exploration of underwater resources, oceanographic data collection, flood or disaster prevention, tactical surveillance system and unmanned underwater vehicles. UWSN uses sensors of small size with a limited energy, memory and allows limited range for communication. Due to multiple differences from terrestrial sensor network, radio waves cannot be used over here. Acoustic channel are used for communication in deep water, which has many limitations like low bandwidth, high end to end delay and path loss. With the above limitations while using acoustic waves, it is very important to develop energy efficient and reliable protocols. Energy efficient communication in underwater networks has become uttermost need of UWSN technology. In this project we have analyzed Depth Based Routing (DBR),

Energy Efficient Depth Based Routing (EEDBR) and Hop by Hop Dynamic Addressing Based (H2-DAB) protocol through simulation. This comparison is carried out on the basis of total consumed energy, end to end delay, and path loss and packet delivery ratio.

3. Mobile Wireless Sensor Network

Energy Efficient Routing Protocol for Mobile Wireless Sensor Network

The mobile wireless sensor network has been applied in wide range of applications. It is used in the fields of surveillance, radiology, chemical plants, agriculture, security based applications, health monitoring systems. The mobile sensor nodes are powered by batteries with limited amount of energy and have limited capacity, memory, processing capability and communication bandwidth. In this project we have used Ad Hoc on Demand Multipath Routing Protocol (AOMDV) for finding multiple paths to transfer the data from source node to destination node. It performs energy efficient routing, when the sink node (base station) is in static state and all other neighboring nodes are in mobile state. Here gateway node acts as a relay for transmitting data from one group of node to another group. The performance of Ad hoc on Demand Multipath Routing Protocol is compared with Ad Hoc on Demand Distance Vector Routing Protocol (AODV) on the basis of energy consumption, throughput, packet delivery ratio and end to end delay.

Thus thorough simulation results depict the energy efficiency, reliability, throughput, and prolonged lifetime of the wireless sensor networks under the influence of the protocols used in this project.

***Keywords**:* WSN; MWSN; UWSN; fuzzy logic; T1FL; T2FL; DBR; EEDBR; H2-DAB; AODV; AOMDV;

Optimized Cuttlefish Algorithm for diagnosis of Parkinson's disease

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Abstract:

This project presents an optimized feature selection based on the traditional cuttlefish algorithm, which is used for diagnosis of Parkinson's disease at its early stage. Although many techniques have been proposed to diagnose the Parkinson's disease at an early stage but none of them are efficient. In this work, to improve the diagnosis of Parkinson's disease, we have introduced a novel improved and optimized version of traditional cuttlefish algorithm (OCFA). The proposed model uses the traditional cuttlefish algorithm (TCFA) as a search strategy to ascertain the optimal subset of features. The decision tree (DT) and k-nearest neighbor (KNN) classifier as a judgment on the selected features that are produced by the OCFA. The Parkinson speech with multiple types of sound recordings and Parkinson HandPD datasets are used to evaluate the proposed model. The proposed algorithm can be used in predicting the Parkinson's disease with an accuracy of approximately 92% and help individual to have proper treatment at early stage. The experimental result reveals that the proposed bio-inspired algorithm finds an optimal subset of features, maximizing the accuracy and minimizing a number of features selected and is more stable.

Keywords: *Parkinson disease, Cuttlefish algorithm, Optimized cuttlefish algorithm, feature selection, diagnosis of Parkinson disease, Decision Tree, k-Nearest Neighbor.*

Delivery System for Retail Products

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***Abstract*:**

Today, logistics executives must deal with new challenges requiring minute-by-minute tracking in all parts of the world, developing cost efficiencies while guaranteeing timely delivery. The progress in techniques and management principles improves the moving load, delivery speed, service quality, operation costs, the usage of facilities and energy saving. Transportation takes a crucial part in the manipulation of logistic. Reviewing the current condition, a strong system needs a clear frame of logistics and a proper transport implements and techniques to link the producing procedures.

Here, we are dealing with a unique subset of this problem. A Central Warehouse needs to deliver perishable items to a set number of retail shops, each having their own set of unique demands. The problem we have chosen is related to an ongoing research in vehicle routing problem with time windows. As per this day, there is no deterministic approach invented which will give best result and solves the problem.

Our goal was to find the best route and the optimal number of trucks required to achieve this objective using Multi Objective Genetic Algorithm, which is a heuristic approach. We addressed this and were able to achieve approximate solutions of optimum paths and number of trucks. A comparison between two crossover operators is shown and our new crossover operator, the Best Cost Route Operator, achieves good results with less population though it takes some running time.

Keywords— *Genetic Algorithm; Delivery; Logistics; VRP; Optimisation*

Hybrid Architecture Performance Analysis for Device to Device Communication in 4g Cellular Networks

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Abstract:

A large number of new data consuming applications are emerging in the daily routines of mobile users. Dev ice to Dev ice (D2D) communication as a new paradigm is introduced to reduce the increasing traffic and off load it to the user equipment (UE). With the development of UE multi radio interface. We first develop a new hybrid architecture concept for D2D communication. The architecture combines ISM 2. 4G spectrum as the Out-Band mode using Bluetooth and Wi-Fi Direct with the cellular spectrum as the In-Band mode. Secondly, we design a scheme that forms the Out-Band cluster and makes the following periodic signaling interaction via the B1uetoothinterface. Traffic is transferred via the Wi-Fi Direct interface inside the cluster but carried on the cellular spectrum among the clusters. Simulation results show that our proposal increases the system throughput, saves power consumption and prolongs the clusters lifetime.

Keywords *- D2D, B1uetooth, Wi-Fi Direct, In-Band, Out-Band, Hybrid architecture, 4G*

Data Security Enhancer

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Abstract:

In today's technology-driven era, high availability of opportunities for startup shares a relationship of proportionality with the need of development of secured environment for their smooth functioning. The organizations need to secure their confidential data from both extrusions and intrusions. Various companies face a major problem of how to make their data secured and to keep the rivals from exploiting vulnerabilities leading to security breaches. Therefore there is a need of a solution which can control flow of data moving within and out of the organization. This project focuses on the use of features of operating system like file permissions, System processes and Clipboard to control the flow of data in the end user system. We propose a novel software solution, DSE (Data Security Enhancer) that (a) uses Clipboard monitoring to monitor copy (b) uses task manager monitoring to monitor running processes (c) uses file permissions for controlling accessibility of files and folders. The Striking feature of DSE system is that it can be implemented on any type of operating system as it uses features which are common in all types of operating systems.

Keywords – *DSE, Security, Extrusions, Intrusions*

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Crime Prediction Based on Clustering Algorithm

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Abstract:

This is the report for the project "Crime prediction based on Clustering Algorithm" developed by Priyesh Mishra, Himanshu Tyagi, and Shubham Palwar, final year students of Bachelor of Technology in Computer Science Engineering at Maharaja Agrasen Institute of Technology. Delhi. Crime analysis and prevention is a systematic approach for identifying and analysing patterns and trends in crime. Our system can predict regions which have high probability for crime occurrence and can visualize crime prone areas. With the increasing advent of computerized systems, crime data analysts can help the Law enforcement officers to speed up the process of solving crimes. About 10% of the criminals commit about 50% of the crimes. Even though we cannot predict who all may be the victims of crime but can predict the place that has probability for its occurrence. K-means algorithm is done by partitioning data into groups based on their means. K-means algorithm has an extension called expectation-maximization algorithm where we partition the data based on their parameters. This easy to implement data mining framework works with the geospatial plot of crime and helps to improve the productivity of the detectives and other law enforcement officers. This system can also be used for the Indian crime departments for reducing the crime and solving the crimes with less time.

Keywords – *Crime Prediction, Clustering, Geospatial plot*

E-Kart Analysis

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Abstract:

There are many shopping portals in market but people prefer to use the product which is reliable, secure and fast. Developer has some of advanced features to make the portal and app much faster and reliable. The name of the project is "E-Kart Analytics". NLP (Natural Processing Language) is used in my system which is most commonly used in AI (Artificial Intelligence) systems. Developer is doing the research for the development for the project. For the development of the proposed system, the developer has done following process of the software development method.

- Literature Review
- Primary Research
- Secondary Research
- Analysis

Developer had done the research on literature review in which advanced preliminary research, domain research and the market research are shown. Developer had chosen two data gathering technique questionnaire and interview to get the feedback and the information for the project development by the user. In questionnaire, developer had tried to get the feedback from almost15 general users and in analysis, the developer had analyzed whole question which are been answered by the professional or experienced user; he further added some functionality to the system according to it. After having questionnaire and the interview session, developer had analyzed, enhanced and set up some goal to develop the system. Developer had done secondary research also. In secondary research, technical research, academic research and the selection of methodology has been shown. In methodology, developer had chosen the Waterfall methodology for the development of the proposed system. The developer has given the overall conclusion of primary research and secondary research for getting the benefits in development of project.

Keywords – *E-Kart, AI, NLP*