2016 IEEE VANETS PROJECT LIST BASED ON NS2

1. Enhanced attacked packet detection algorithm for detecting dos attack in vanet

Vanet is an ad hoc network of independent nodes moving freely in the network and coordinated by the RSU(Roadside Units) . Each node in the network represents vehicle, for instance car, provided with individual OBU (onboardunit) to communicate with other nodes. The nodes move in the dynamic network covering the range of 100 to 300 meters to connect to each other and form wireless network. It has become the key component of Intelligent Transportation System(ITS). Several renowned automobile companies endorse this term. In Vanet, communication scenario can be V2V or V2I. Such a dynamic set-up is prone to various security attacks such as Wormhole attack, Blackhole attack, Denial of Service attack. To ensure the safety of vehicles, availability is enormously needed to communicate safety messages to and from the RSU. In this paper we proposed Enhanced Attacked Packet Detection Algorithm (EAPDA) which is used to verify and detect the malicious nodes creating DOS attack. Simulation results using NS2 shows improved false positive rate and throughput along with minimized delay thus enhancing the security.

2. A novel mechanism for detecting DOS Attack in VANET using Enhanced Attacked Packet Detection Algorithm (EAPDA)

Security is the major concern with respect to the critical information shared between the vehicles. Vehicular ad hoc network is a sub class of Mobile ad hoc network in which the vehicles move freely and communicate with each other and with the roadside unit (RSU) as well. Since the nodes are self organized, highly mobile and free to move therefore any nodes can interact with any other node which may or may not be trustworthy. This is the area of concern in the security horizon of VANETs. It is the responsibility of RSU to make the network available all the time to every node for secure communication of critical information. For this, network availability occurs as the major security requirement, which may be exposed to several threats or attacks. The vehicles and the RSU are prone to several security attacks such as masquerading, Sybil attack, alteration attack, Selfish driver attack, etc. Among these Denial of Service attack is the major threat to the availability of network. In order to shelter the VANET from DoS attack we have proposed Enhanced Attacked Packet Detection Algorithm which prohibits the deterioration of the network performance even under this attack. EAPDA not only verify the nodes and detect malicious nodes but also improves the throughput with minimized delay thus enhancing security. The simulation is done using NS2 and the results are compared with earlier done work.

3. Solving traffic congestion – an application of vanet

Vehicular Ad Hoc Network (VANET) is an evolving technology of today's world and is expected to be all pervasive in the near future. The vehicles in VANET possess mobility as well as computational processing power. The vehicles collaboratively form the ad-hoc network and are peers of each other. This paper discusses solving Traffic Congestion as an application of VANET. We have simulated the work of mobility on Network Simulator Tool(NS2),in which we have simulated the traffic roads with the help of SUMO(Simulation of urban mobility) using routing protocol AODV.

4. Performance Evaluation of an Enhanced Hybrid Wireless Mesh Protocol (E-HWMP) for VANET.

In this paper we evaluate Enhanced Hybrid Wireless Mesh Protocol (E-HWMP), an enhanced version of HWMP based on IEEE802.11p and IEEE802.11s standards, especially created for Vehicular Ad-hoc Networks (V ANETs). An enhanced gateway selection algorithm for multi-hop relay in VA NET- LTE integration network is proposed. In the proposed algorithm the gateway selection is implemented using the E-HWMP protocol. The proposed gateway selection algorithm aims to improve the handoff efficiency and increasing the data rate while minimizing the average delay and overhead. Therefore, a multi-hop routing over the V ANET network is designed. NS2 simulator is

used to evaluate the system performance of the proposed gateway selection algorithm (E-HWMP). The results show that, compared to conventional methods, the proposed algorithm significantly improves the system performance in terms of packets delivery ratio, overhead and average end-to-end delay.

5. A Hybrid Model to Extend Vehicular intercommunication V2V through D2D Architecture

In the recent years, many solutions for Vehicle to Vehicle (V2V) communication were proposed to overcome failure problems (also known as 'dead-ends'). This paper proposes a novel framework for V2V failure recovery using Device-to-Device (D2D) communications. Based on the unified Intelligent Transportation Systems (ITS) architecture, LTE-based D2D mechanisms can improve V2V 'dead-ends' failure recovery delays. This new paradigm of hybrid V2V-D2D communications overcomes the limitations of traditional V2V routing techniques. According to NS2 simulation results, the proposed hybrid model decreases the end to end delay (E2E) of messages delivery. A complete comparison of different D2D use cases (best & worst scenarios) is presented to show the enhancements brought by our solution compared to traditional V2V techniques.

6. CDRA: Cluster-based Dynamic Routing Approach as a development of the AODV in Vehicular Ad-hoc Networks

Over the last few decades, the researchers have been fascinated towards vehicular networks. Vehicular ad-hoc network (VANET) is a highly dynamic wheeled network, where the on road vehicles and road - side units considered as nodes to allow the wireless communication. Each node acts as the host in VANETs. Due to high dynamic nature of VANETs the mobility pattern and the network topologies change frequently, that make it differ from the other type of ad-hoc network. The challenge of this research is a crucial designing for dynamic routing protocol in VANETs. This paper proposes a cluster-based approach for dynamic routing in VANETs. This new routing approach have an aim of increasing the overall network throughput, delivery ratio with less normalized routing load in comparison of AODV. Extensive simulations are carried out in NS2 to appraise the efficiency of the proposed cluster- based routing approach.

7. Multi-Hop Cluster based IEEE 802.11p and LTE Hybrid Architecture for VANET Safety Message Dissemination

Several Vehicular Ad hoc Network (VANET) studies have focused on the communication methods based on IEEE 802.11p, which forms the standard for Wireless Access for Vehicular Environments (WAVE). In the networks employing IEEE 802.11p only, the broadcast storm and disconnected network problems at high and low vehicle densities respectively degrade the delay and delivery ratio of safety message dissemination. Recently, as an alternative to the IEEE 802.11p based VANET, the usage of cellular technologies has been investigated due to their low latency and wide range communication. However, a pure cellular based VANET communication is not feasible due to the high cost of communication between the vehicles and the base stations, and high number of hand-off occurrences at the base station considering the high mobility of the vehicles. This paper proposes a hybrid architecture, namely VMaSC-LTE, combining IEEE 802.11p based multi-hop clustering and the fourth generation cellular system, Long Term Evolution (LTE), with the goal of achieving high data packet delivery ratio and low delay while keeping the usage of the cellular architecture at minimum level. In VMaSC-LTE, vehicles are clustered based on a novel approach named VMaSC: Vehicular Multi-hop algorithm for Stable Clustering. The features of VMaSC are cluster head selection using the relative mobility metric calculated as the average relative speed with respect to the neighboring vehicles, cluster connection with

minimum overhead by introducing direct connection to the neighbor that is already a head or member of a cluster instead of connecting to the cluster head in multiple hops, disseminating cluster member information within periodic hello packets, reactive clustering to maintain cluster structure without excessive consumption of network resources, and efficient size and hop limited cluster merging mechanism based on the exchange of the cluster information among the cluster heads. These features decrease the number of cluster heads while increasing their stability therefore minimize the usage of the cellular architecture.From the clustered topology, elected cluster heads operate as dual-interface nodes with the functionality of IEEE 802.11p and LTE interface to link VANET to LTE network. Using various key metrics of interest including data packet delivery ratio, delay, control overhead and clustering stability, we demonstrate superior performance of the proposed architecture compared to both previously proposed hybrid architectures and alternative routing mechanisms including flooding and cluster based routing via extensive simulations in ns-3 with the vehicle mobility input from the Simulation of Urban Mobility (SUMO). The proposed architecture also allows achieving higher required reliability of the application quantified by the data packet delivery ratio at the cost of higher LTE usage measured by the number of cluster heads in the network.

8. Understanding spurious message forwarding in VANET beacon-less dissemination protocols: an analytical approach

Message dissemination is a key component of Vehicular Ad hoc Networks (VANETs). It enables the capability of Intelligent Transportation Systems to support safety and infotainment services for vehicles and people on travel. Dissemination in VANETs typically relies on the intelligent election of selected vehicles to act as relay nodes, a critical element that serves to avoid broadcasting storm issues. This paper presents an analytical model for evaluating the performance of a class of distributed, beacon-less, dissemination protocols in a linear VANET (e.g., a highway). NS-2 based simulations are employed to validate the model. The results are used to gain insight into the spurious forwarding problem, which accompanies the use of timer-based VANET networking protocols. We characterize the impact of this phenomenon on the achievable level of the system's broadcast throughput capacity rate. Resolution approaches are proposed and analyzed.