

Mobility Prediction in Vehicular Ad Hoc Networks: A Survey

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Abstract—VANET is an ad-hoc network that organizes itself and is composed of self-regulating nodes where the vibrant node mobility changes the network topologies frequently. The important goal of introducing VANET stands to upgrade road safety conditions to minimize extent of road mishaps. The nodes are very mobile in vehicular ad hoc network so routing becomes complex job. As the VANET nodes move very fast the topology changes accordingly. So node mobility prediction in an ad-hoc network of vehicles remains a very important issue. Further prediction of mobility helps to estimate the stable path between the nodes which leads to better routing. Estimating secure paths among the routing of nodes reform in a better way, thereby reducing the overhead and minimizing interruptions in connections. This paper explores VANET's basic architecture and discusses a number of current mobility prediction techniques, and concludes with summary of VANET's proposed mobility prediction methods.

Keywords: *Mobility, Mobility Prediction, VANET, Topology, OBU, RSU, Intelligent Transportation System, Microscopic, Macroscopic.*

1. Introduction

VANETs is gaining broad recognition now a days because it is being used in various applications. VANET is based on communication among vehicles. For example, vehicles / mobile nodes may exchange different data, like road traffic problems, safety data, traveler associated data and applications. It is providing travelers and drivers convenience, safe and pleasant excursions. The key significance of wireless communication used in VANET is that, since the user is in motion and not confined to a fixed spot, they allow more dynamic communication paradigm compared to wired networks. Furthermore, there is no fixed wired communications system for vehicle ad hoc networks, including cellular networks. VANETs are used in catastrophe recovery systems and distributed collaborative computing. Multi-hop routes are commonly used in these situations, and network hosts transmit messages using packet radios. In random actions, all host travels and routes are subject to frequent changes. Due to node mobility, protocol designing is challenging in VANET[1]. The protocol should be adjusted to frequent changes in topologies that are clear to the end user. Generally in VANET a certain level of regularity is observed in node mobility pattern. A vehicle on a lane is planned for some time to follow the track and maintain its speed. The future status of network