**Kalman Prediction-Based Neighbor Discovery and Its Effect on Routing Protocol in Vehicular Ad Hoc Networks**

**Abstract:**

Efﬁcient neighbor discovery in vehicular ad hoc networks is crucial to a number of applications such as driving safety and data transmission. The main challenge is the high mobility of vehicles. In this paper, we proposed a new algorithm for quickly discovering neighbor node in such a dynamic environment. The proposed rapid discovery algorithm is based on a novel mobility prediction model using Kalman ﬁlter theory, where each vehicular node has a prediction model to predict its own and its neighbors’ mobility. This is achieved by considering the nodes’ temporal and spatial movement features. The prediction algorithm is reinforced with threshold triggered location broadcast messages, which will update the prediction model parameters, and improve the efﬁciency of the neighbor discovery algorithm. Through extensive simulations, the accuracy, robustness, and efﬁciencypropertiesof our proposed algorithm are demonstrated. Compared with other methods of neighbor discovery, which are frequently used in HP-AODV, ARH, and ROMSG, the proposed algorithm needs the least overheads and can reach the lowest neighbor error rate while improving the accuracy rate of neighbor discovery. In general, the comparative analysis of different neighbor discovery methods in routing protocol is obtained, which shows that the proposed solution performs better than HP-AODV, ARH, and ROMSG

**SYSTEM REQUIREMENTS:**

**HARDWARE REQUIREMENTS:**

* System : Pentium Dual Core.
* Hard Disk : 120 GB.
* Monitor : 15’’ LED
* Input Devices : Keyboard, Mouse
* Ram : 1 GB

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows XP/UBUNTU.
* Implementation : NS2
* NS2 Version : 2.28
* Front End : OTCL (Object Oriented Tool Command  Language)
* Tool : Cygwin (To simulate in Windows OS)