

A NEW HYBRID ROUTING PROTOCOL USING A MODIFIED K-MEANS CLUSTERING ALGORITHM AND CONTINUOUS HOPFIELD NETWORK FOR VANET

ABSTRACT

Vehicular Ad-hoc Networks (VANET) offer several user applications for passengers and drivers, as well as security and internet access applications. To ensure efficient data transmission between vehicles, a reliable routing protocol is considered a significant challenge. This project suggests a new clustering-based routing protocol combining a modified K-Means algorithm with Continuous Hopfield Network and Maximum Stable Set Problem (KMRP) for VANET. In this way, the basic input parameters of the K-Means algorithm, such as the number of clusters and the initial cluster heads, will not be selected randomly, but using Maximum Stable Set Problem and Continuous Hopfield Network. Then the assignment of vehicles to clusters will be carried out according to Link Reliability Model as a metric that replaces the distance parameter in the K-Means algorithm. Finally, the cluster head is selected by weight function according to the amount of free buffer space, the speed, and the node degree. The designed protocol performs better in a highway vehicular environment, compared to the most recent schemes designed for the same objective. In fact, KMRP reduces traffic congestion, and thus provides a significant increase in Throughput. In addition, KMRP decreases the transmission delay and guarantees the stability of the clusters in high density and mobility, which acts better in terms of the Packet Delivery Ratio.