

## A Weighted K-Medoids Clustering Algorithm for Effective Stability in Vehicular Ad Hoc Networks

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**Abstract :** In a highway scenario, the vehicle speed can exceed 120 kmph. Therefore, any vehicle can enter or leave the network within a very short time. This mobility adversely affects the network connectivity and decreases the life time of all established links. To ensure an effective stability in vehicular ad hoc networks with minimum broadcasting storm, we have developed a weighted algorithm based on the k-medoids clustering algorithm (WKCA). Indeed, the number of clusters and the initial cluster heads will not be selected randomly as usual, but considering the available transmission range and the environment size. Then, to ensure optimal assignment of nodes to clusters in both k-medoids phases, the combined weight of any node will be computed according to additional metrics including direction, relative speed and proximity. Empirical results prove that in addition to the convergence speed that characterizes the k-medoids algorithm, our proposed model performs well both AODV-Clustering and OLSR-Clustering protocols under different densities and velocities in term of end-to-end delay, packet delivery ratio, and throughput.

**Keywords :** communication, clustering algorithm, k-medoids, sensor, vehicular ad hoc network

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