

Improved Hypergraph Clustering with Weighted GRA for Dynamic VANET Environment

Abstract

The concept of a smart city has essentially forced an urge on the strong infrastructure of vehicular communication. In a dynamic environment especially the urban cities, communication overhead has the issue of scalability and stability. Clustering has been seen as a prominent solution to address the issues in vehicular ad hoc networks (VANET). The slow dragging and high-speed vehicle management, along with the direction change due to junctions, and hybrid velocities an effective approach has been designed in this article. The article bifurcated the design approach into two folds: the cluster generation with improved hypergraph clustering, where the sparsity in the vehicle connection is levied and the cluster head (CH) selection part. Four different parameters neighborhood, eccentricity, relative speed and the key attribute to estimate the time to leave are extracted from each vehicle. The relational analysis of these four CH selection attributes is attempted with Grey Relational Analysis (GRA). There is an evident change in stability with the incorporation of junction information and reactive speed variation. Also, there is a considerable increase in stability using our proposed compared to the other state of art methods in junction analysis.

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