International Journal on Recent Researches In Science, Engineering & Technology
(Division of Computer Science & Engineering)
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It is an absolutely free (No processing charges, No publishing charges etc) Journal Indexed in JIR, DIIF and SJIF.
Research Paper
Available online at: www.jrrset.com

ISSN (Print) : 2347-6729
ISSN (Online) : 2348-3105

Volume 4, Issue 4,
April 2016.

JIR IF : 2.54
DIIF IF : 1.46
SJIF IF : 1.329

Cluster Detection of Mobile Nodes using VANET oriented evolving graph model to avoid border nodes problem

1 G.Shanmugapriya, M.A.M College of Engineering, Tiruchirapalli, priyasgovind@gmail.com[1]
2 Prof. S. Ravimaran$_{Principal/CSE}$,M.A.M College of Engineering, Tiruchirapalli, principalmamce@mamce.org[2]

ABSTRACT

Vehicular ad hoc networks (VANETs) are a special form of wireless networks made by vehicles communicating among themselves on roads. The conventional routing protocols proposed for mobile ad hoc networks (MANETs) work poorly in VANETs. As communication links break more frequently in VANETs than in MANETs, the routing reliability of such highly dynamic networks needs to be paid special attention. To date, very little research has focused on the routing reliability of VANETs on highways. In this paper, we use the evolving graph theory to model the VANET communication graph on a highway. The extended evolving graph helps capture the evolving characteristics of the vehicular network topology and determines the reliable routes preemptively. This paper is the first to propose an evolving graph-based reliable routing scheme for VANETs to facilitate quality-of-service (QoS) support in the routing process. A new algorithm is developed to find the most reliable route in the VANET evolving graph from the source to the destination. We demonstrate, through the simulation results, that our proposed scheme significantly outperforms the related protocols in the literature.

Keywords: Vanet, Manet, DG2CEP, Quality of service (QOS), VOEG router, Cluster, Cluster formation and Emergency node