



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

Name of the Student : SWAGAT RANJAN SAHOO

Roll Number : 176101011

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Name of Thesis Supervisor(s) : Dr. Moumita Patra

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SHORT ABSTRACT

Vehicular Ad hoc NETWORKS (VANETs) have become an important part of a smart city environment. Vehicles are equipped with on-board units which allow them to run applications and communicate with Road Side Units (RSUs). RSUs are connected to a local server with some amount of storage and computing resources to run Virtual Machines (VMs) that process the application requests generated by vehicles. They act as a cloudlet and provide cloud support to requests. These requests may have different deadlines and resource requirements like storage, computing, and content delivery. Processing the application requests at RSUs may make some of the RSUs overloaded, especially near road intersections where a larger number of vehicles are present. This significantly affects the quality of service by increasing delay and decreasing the number of requests processed. Deployment of more RSUs may reduce the chances of overloaded RSUs. However, the cost of deployment of RSUs and their maintenance cost does not allow us to add a large number of RSUs. In this scenario, it is necessary to either increase the total resource availability by using the resources from some entities in the scenario or utilize the available resources of the network efficiently. In this thesis, we propose a set of algorithms to assign the application requests to a target node in the network such that the number of requests processed is maximized while minimizing the end-to-end delay. The target node may be an RSU, Central Cloud (CC) or Parked Vehicle (PV). First, we have utilized the available resources of other RSUs by migrating the Virtual Machines (VMs) from the overloaded RSU to other RSUs with available resources. Second, we have rented the resources from other RSUs with consideration of migration cost and rent-out cost. Third, we have rented the resources from other RSUs, PVs and the CC to process the application request. In all the scenarios, we have focused on efficient management of cost such that the users and the service providers are benefited. The proposed algorithms are evaluated by extensive simulations and their performance is compared with state-of-the-art algorithms for similar scenarios.