**ABSTRACT**

Mobile Ad hoc Networks (MANETs) are communication networks built up of a collection of mobile devices which can communicate through wireless connections. MANET’s find applications in the areas of Military Operations, Collaborative and Distributed Computing, Emergency Operations, Wireless Mesh Networks. Some problems faced in MANETs are changing topology, energy management, deterioration of Quality of Service (QoS) and lack of security measures.

The issue taken up is that of energy management in the network layer of the node. The energy conservation metrics on the basis of which we can make routing protocols energy efficient are transmission power, remaining energy capacity, estimated node lifetime, combined energy metric. Ad-hoc On-demand Distance Vector (AODV) routing protocol was chosen for the study.

The objectives of the project are:

1. To fine tune AODV routing protocol to make it energy efficient.
2. To evaluate the performance of this algorithm by comparing it with Traditional AODV and a protocol with a single energy metric implemented in it (which will be referred to as Single Metric AODV throughout this work)

Combined Energy Metric AODV protocol (which will henceforth be referred as CEM\_AODV) was developed by integrating AODV with energy metrics transmission power and remaining energy capacity. CEM\_AODV was compared with Traditional AODV and Single Metric AODV using the metrics average energy consumed, network lifetime, throughput, packet delivery ratio and convergence time. The modules were designed and documented using UML.

Simulations were done using ns2 2.34 network simulator. The results of simulation were analyzed it is found that CEM\_AODV is better than Traditional AODV for average energy consumed, network lifetime, convergence time and packet delivery ratio. But Traditional AODV has better values for throughput. CEM\_AODV has better values of throughput, convergence time and packet delivery ratio than Single Metric AODV. But both have the same average energy consumed and network lifetime.