ABSTRACT

In this dissertation, we address the problem of finding an optimal coverage of sensor nodes in WSN while ensuring connectivity among sensors. This connectivity preservation is achieved without using centralized control and accurate location information. The optimal node coverage is done according to OTLBO (Orthogonal Teaching Learning Based Optimization) in order to improve network coverage. OTLBO is an improvement over TLBO (Teaching Learning Based Optimization) that makes TLBO fast to converge and more robust. OTLBO is a recent approach in the optimization field. The connectivity preservation algorithm is localized and is based on a subset of neighbors for taking motion decision. The connectivity preserving algorithm maintains a connected topology; the distance covered by the mobile nodes is constrained by the connectivity of the node to its neighbors in a connected sub-graph like the relative neighborhood graph. Finally the node coverage is based on OTLBO optimization technique.

Key Words— Sensor, connectivity, coverage, deployment, OTLBO.

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CERTIFICATE

This is to certify that the dissertation titled **"A hybrid Approach to Optimize Node Deployment & Coverage Connectivity in Wireless Sensor Network"** is a bona fide record of work done by **Anand Prakash, Roll No. 2K13/CSE/02** at **Delhi Technological University** for partial fulfilment of the requirements for the degree of Master of Technology in Computer Science & Engineering. This project was carried out under my supervision and has not been submitted elsewhere, either in part or full, for the award of any other degree or diploma to the best of my knowledge and my belief.

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List of Abbreviations

WSNs	Wireless Sensor Networks
QoS	Quality of Service
MEMS	Micro-Electro Mechanical System
ADC	Analog to Digital Convertors
PMP	Power Management Plane
MMP	Mobility Management Plane
BS	Base Station
TMP	Task Management Plane
MAC	Medium Access Control
H/W	Hardware
S/W	Software
GPS	Global Positioning System
AI	Artificial Intelligence
TLBO	Teaching Learning Based Optimization
OTLBO	Orthogonal Teaching Learning Based Optimization
OD	Orthogonal Design
ABC	Artificial Bee Colony Algorithm
UDG	Unit Disk Graph
PSO	Particle Swarm Optimization
GA	Genetic Algorithm
RNG	Relative Neighborhood Graph