

## Accepted Manuscript

Glider assisted schemes to deploy sensor nodes in Wireless Sensor Networks

Sharma Vikrant, Patel R.B., Bhadauria H.S., Prasad D.

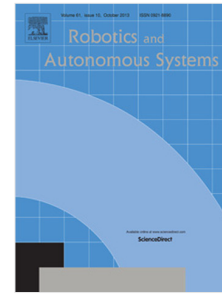
PII: S0921-8890(16)30614-5  
DOI: <https://doi.org/10.1016/j.robot.2017.10.015>  
Reference: ROBOT 2938

To appear in: *Robotics and Autonomous Systems*

Received date: 3 October 2016  
Revised date: 17 August 2017  
Accepted date: 20 October 2017

Please cite this article as: Sharma Vikrant , Patel R.B. Patel R.B, Bhadauria H.S. Bhadauria H.S, Prasad D. Prasad D, Glider assisted schemes to deploy sensor nodes in Wireless Sensor Networks, *Robotics and Autonomous Systems* (2017), <https://doi.org/10.1016/j.robot.2017.10.015>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Glider Assisted Schemes to Deploy Sensor Nodes in Wireless Sensor Networks

Sharma Vikrant<sup>1</sup>, Patel R. B<sup>2</sup>, Bhadauria H S<sup>1</sup>, Prasad D<sup>3</sup>

<sup>1</sup> Govind Ballabh Pant Engineering College, Pauri Garhwal,  
Uttarakhand, India  
[e-mail: vikrant.cse@gbpec.ac.in]

<sup>2</sup> Chandigarh College of Engineering and Technology,  
Chandigarh, India  
[e-mail: rbpatel@ccet.ac.in]

<sup>3</sup> Chandigarh Engineering College, Landran, Mohali  
Chandigarh, India  
[e-mail: devendraacad@gmail.com]

**Abstract:** Wireless Sensor Network (WSN) is emerging as a valuable resolution to distant monitoring and control issues. These are used to keep an eye on the remote, hazardous, antagonistic, and large-scale target-regions. Random dispersion of Sensor Nodes (SNs) from air is the most suited technique to set up WSN in such regions, but it endure various imperfections, i.e., a large number of SNs are needed to attain preferred coverage level. Moreover, its randomness may be hampered by atmospheric winds while dropping from air. In this research article three models for the precise placement of SNs have been proposed. Each successive model is an enhancement and refinement of its base model. The proposed models utilize the potential attained as a result of high falling height to position the SNs on their preferred locations (PLs). All the PLs are computed initially and SNs are equipped with a small sized economical carrier glider (CG) which floats them to their PL. The movement of a glider is controlled by the piloting SN. The first model defines the significance of a virtual path and the technique used by a CG to follow it to reach its PL. But, it suffers from a path swerving problem. The second model incorporates the virtual-path updating mechanism in the basic model. This rectifies the problem of path swerving and makes it resistant to the winds. The third model further refines its base model by introducing a radius reduction technique to enhance its precision and energy efficiency. The proposed models use an obstinate technique to maintain the direction of movement of a floating CG towards the PL in order to deal with atmospheric winds.

**Keywords:** Sensor Node, deployment, Coverage, Wireless Sensor Network, Carrier Glider

## 1. Introduction

Sensors are the vital element of any automatic system. A Wireless Sensor Network (WSN) is made up of a number of Sensor Nodes (SNs) installed over a target-region [1] [2] [3]. A SN is an inexpensive and robust gadget which makes it appropriate for antagonistic and unsafe environments. SNs can be categorized as mobile sensor nodes (MSNs) and static sensor nodes (SSNs). WSN has a large range of functional domain such as medical, military, pollution monitoring, human health monitoring, disaster management, forest fire detection, etc. [4] [5] [6] [7] [8] [9] [10] [11]. SNs exhibit various shortcomings such as limited communication range  $r_c$ , battery, sensing range  $r_s$ , etc. Researchers have projected various methods to improve and uphold the workability of a WSN in terms of life, connectivity, coverage and

Download English Version:

<https://daneshyari.com/en/article/6867295>

Download Persian Version:

<https://daneshyari.com/article/6867295>

[Daneshyari.com](https://daneshyari.com)