

## Secure Reputation based Target Sensing in Wireless Sensor Networks

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Security and Data Privacy have become the need of the day and is true for all networks. Wireless Sensor Networks (WSNs) are by its nature more prone to security attacks and data losses. One of the most challenging area in WSNs which needs security is target localization. Cryptographic authentication can be used for the identity of a node, but this requires key management and encryption overhead. Also with the existence of faulty sensors, the quality of security algorithms based on encryption methods will degrade. In this paper we propose a reputation based systems that give better results. We use a reputation based voting algorithm to get the reliable data. In addition to this we are concentrating on acoustic sensor nodes which uses Particle Swarm Optimization (PSO) algorithm for Location Estimation. We propose Secure Reputation Update Target Localization (SRUTL) algorithm which addresses target localization and security issues *viz.*, bad-mouth attack, Sybil attack, on-off attack and malicious node attack at different levels of target localization. Simulation results shows positive response in attack detection and energy consumption, hence contribute in building an energy efficient secure wireless sensor network.

**Keywords :** Insider Attacks, Reputation System, Security, Target Localization, Wireless Sensor Networks (WSNs).

### 1. INTRODUCTION

Wireless Sensor Networks are known for their environment sensitive data collection and analysis which helps to solve most of the real world problems. Besides its resource constraint characteristics like, limited battery power, bandwidth, limited memory and network characteristics like, unreliable communication, higher latency, *etc.*, it has emerged as a platform for signal processing and communication. Geographical information is one of the most important parameter in WSNs. The data stream is relevant only if location information of monitoring event is known. This issue is usually known as Acoustic Target Localization (ATL) problem. Along with sensing, computing and communicating, the WSNs should also provide security to the sensor network.

Military base, which requires fast and accurate location information of its groups and se-

cure channel to guard against enemy intervening our military signals can explain why ATL problem is so important in WSNs. In this scenario, the communication network should be fast and accurate with less overhead and at the same time defend itself against various attacks like node compromise, replay attack, malicious nodes, *etc.*, from the other side. Another example to show importance of ATL problem is vehicle monitoring scenario. As sound emitted by vehicles are not Omni-directional, target location estimation become complex. The complexity increase with addition of environmental noise, multi targets presence and thus the robust reputation system come to the rescue.

The target location estimation in WSNs can be performed using either centralized or decentralized localization techniques. Reputation system provides a method of decentralized localization, wherein every node is

in our future works. Simulation results show that SRUTL can successfully overcome various attacks at different levels of the algorithm for target localization using reputation.

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