

# “A Novel Approach to detect the Movements of target in Wireless sensor networks”

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**Abstract**— Tracking of target is one of the foremost applications of WSNs (Wireless sensor networks). It has a great importance in military surveillance, medical etc. The major challenges in this technique are node failure rates and the entry of multiple targets that makes the system more complex. In this system the network provide unique ID to each target. So that we can reduce the failure rate and increase the network lifetime.

**Keywords**-component; Wireless sensor networks, multiple target detection, edge detection.

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## I. INTRODUCTION

Wireless sensor networks (WSNs) is a new modified technology with great potential for improving application in military, industrial process etc. It has one more major application in wireless sensor network that is target detection and tracking [2]. The tracking of multiple targets is real-time application of sensor networks [2]. In existing system nodes should be organized into groups (eg. Clusters) [8][9] to track a mobile target. Organizing groups of nodes with exact measurements of targets movement is strenuous. In our project, we design a face track, that detects the movements of target using polygon(face) tracking. In this field [1] a unique ID for each target is provided. We implemented a brink detection algorithm that empowers the WSNs to be aware of a target entering the polygon a bit earlier and work in timely fashion [8].

**Main Concept:-** The area covered by the sensor is face. Each face contains some of the connected keys. Every 2 points of a face share an edge that is also common verge (i.e. edge) between two adjacent faces. The faces can be different sizes and geometrical shapes. Target moves in face and accordingly polygon changes its position. Here we call them a polygon. Target detection mainly involves 2 events.

1) Finding the target location.

2) Sending the collected data to the main center.

But to achieve accurate location and reduce the energy consumption of both these are not possible. We have to compromise on accuracy or energy consumption [3]. Hence we used the face track method.

The result of face track modus shows that it has the ability to track a target with high accuracy and minimize the energy cost of wireless sensor networks [1].

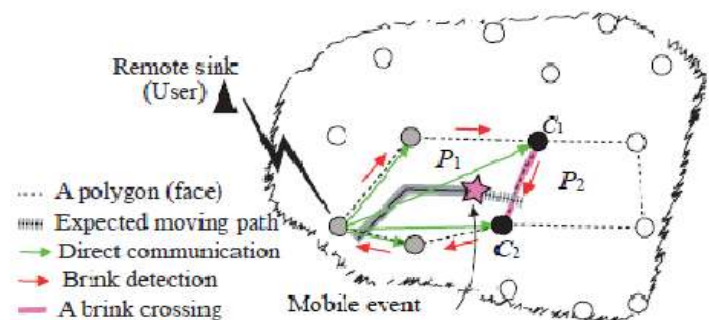


Figure.1 The face tracking model

Underneath are some assumptions of face track.

- The main motto of WSNs is to sense the target and optionally observe it [4]. Such as tracking of an enemies vehicle. We consider a single goal i.e. “A car” is being tracked in the WSNs within maximum off, on road speed of vehicle of around 10m/s [1].
- Assumed that all sensors in this system are to be homogeneous.
- The WSNs is made up to have some fault or damaged nodes. It is haphazardly set after initialization of the system.

In this technique we used polygon to describe the target path. Considering a moving polygon target i.e. “A”. If “A” is detected by any node and it is encircled by any polygon suppose ‘P1’. Then the ‘P1’ is nothing but the active polygon (Pc) and the node in ‘P1’ are active node. From Figure. 2 P1 is pentagon, P2 is tetragon, P3 is triangle. P1 is aware of the following information:-

- Its Own Information.
- Information of active node.
- Information of bordering polygon.

d) Information about neighbors through communication.

The target may move from P1 to P2 (i.e. from active polygon to adjacent polygon) Then the P2 is nothing but the forward polygon [9]. Suppose the target travels towards P2 it crosses its verge (V4,V3) thus V4 and V3 are Couple nodes (CNs).

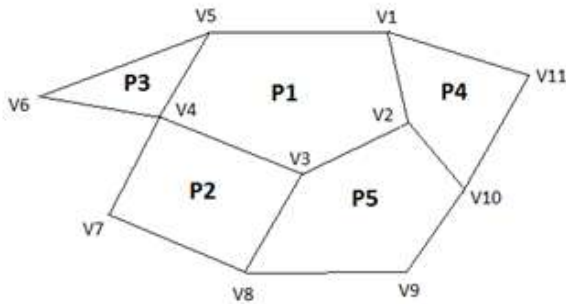


Figure.2 An example of sensor node

## II. RELATED WORK

Wireless sensor network is widely used in research communities and public. The tracking of target in WSNs is the key application. Existence of the system requires group of sensor node to track a object and predicating those movements. But these are quite complicated in practice. So for that we propose a new tracking frame work called face track [5]. In a network if the target is in their range, the sensor node senses it in their respective area and focuses on information like signal strength, power or any other unique characteristic of target under surveillance [7].

Establishment of node selection algorithm [10], Global node selection algorithm (GNS) and Autonomous node selection algorithm (ANS) [10] was done in year 2007. GNS algorithm considers use of sensor node within the range of active node for next data collection to give a judgment concerning upon which nodes should be active. ANS algorithm used for local node data collection. In this system any node can be removed or added, it will not create any problem in network [10].

Zhang and Cao [4] introduced a tree based approach for target tracking, called DCTC (Dynamic Convoy Tree Based Collaboration). When target is ready to enters into detection region, sensor nodes communicate with each other and decide a sensible node for collection of details related to object . When objet moves away from the best node, it becomes energy consuming.

Guojun Wang [11] Introduced cell (Face)Track scheme helps to select optimized nodes those who provides most information , in present scheme all the nodes are active irrespective to the target .In this all other nodes are in rest mode. Also, in case of sensor faults or loss of tracking, this scheme maintains

Precise tracking by extending polygon area without reconstructing the whole network.

In other project the large number of nodes is active for longer time. i.e. nodes uses the system for a small duration but it stays active for a longer duration.

Whereas in face track the nodes that are outside the Pc are silent. The nodes become active only when they are ready to detect the target information. i.e. nodes of active polygon.

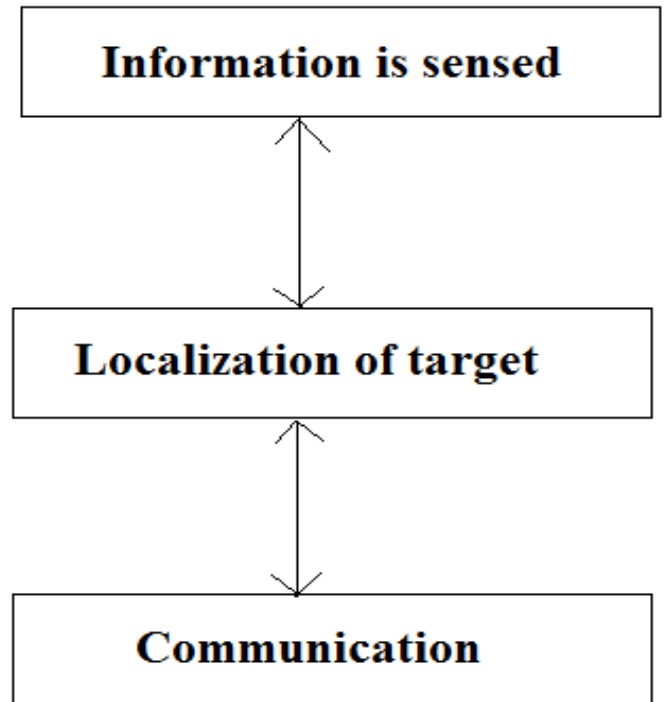


Figure.3 Parts of Target Tracking System

In intensity based happening scheme [8], event localization and detection framework is launched. In this, two algorithms are put forward, distributed election winner notification algorithm (DENA) and intense based localization algorithm (ILA) [8]. DENA determines closest sensor node to a target of interest (i.e. winner node) and appraises all other active sensor nodes about winner. DENA uses dynamic broadcast protocol (DDB) which causes auxiliary delay. The goal of this face track is to reduce the energy cost required by nodes in polygons. During the localization of mechanism used we are trying to minimize the energy cost. [6][3].

## III. PERFORMANACE ANALISIS AND ISSUES

The Obstacles that can occur while performing this different method are given below:-

- a) Complexity of algorithm
- b) Energy cost
- c) Energy efficiency

In this methods enumber of sensors are being, but it is not necessary that all of the sensors may provide useful data. but nodes uses the system for a small duration but it stays active for a longer duration.

#### IV. CONCLUSION

The functionality of this application is in positioning area and tracking the unauthorized target in a field. In sensor system each tiny node has limited ability to process all things (receive, transmit signal and processing the information). As nodes in WSNs have scanty energy due to minimized energy consumption of sensor node. WSNs require energy as one of its most key feature to track movement of target. The other approaches used for tracking of target introduce complex algorithm and complexity in implementation to the real world. Interfacing of software with vehicle to this system and the system can collect the tracking history and all other necessary information regarding vehicle and them forward this all important information to main center.

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