Enhanced Event Triggered Localization Algorithm with a Parameter of Energy Transmission and Energy Received in Mobile Wireless Sensors Networks

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ABSTRACT
Many localization algorithm proposed for wireless sensor networks(WSN) .Localization is a term that can be defined as the determination of the exact physical location of each sensor node in a geographic map or to find its relative location from a topology map in a given network structure. Many localization algorithms for MWSN are less accurate and more time consuming. Localization In this paper, first, we propose a localization algorithm in which distance is estimated from sink node to person and GPS to person. Second, we transmit energy of sink node to person and transmit energy of GPS to person.

Keywords
MWSN, GPS, WSN.

1. INTRODUCTION
Wireless sensor networks built up of sensor nodes which consist of sensing, computing, communication, actuation and power components that cooperatively perform the task of collecting relevant data and monitor its surrounding for some change or event to occur . WSN's has its own features that not only differentiate it from other wireless networks. In WSNs, sensor nodes are deployed in different locations to be responsible for perceiving local information and reporting to sink nodes. Sink nodes are distinguished devices with powerful computation capacity, large memory size , high power energy and long communication range , so as to collect data from SNs . Sink nodes act as the gateway between WSNs and the end user.

The original idea to localize mobile sensor nodes is using a global positioning system (GPS) on every mobile sensor. But considering the cost and power consumption, the GPS solution is not acceptable in many applications . Some special sensor nodes which used namely called as anchor nodes which already know their absolute Locations via GPS or manual placement. Other sensor nodes estimate their locations based on the information provided by these anchor nodes.

In this paper we first estimate the distance and then transmit energy of sink node to person and transmit energy of GPS to person in the form of graph

The rest of the paper organized as follows. Section II provides an overview of existing localization algorithm using anchor nodes. In section III, our localization scheme is proposed. The simulation and analysis are presented in section IV. In section V we draw our conclusion.

2. RELATED WORK
A Large number of existing localization schemes have been proposed to solve the localization problems in WSNs. Each sensor nodes uses a technique or several techniques in order to calculate distance. Literature [1] provides detailed survey of secure and energy efficient adaptive routing for wireless sensor networks. This paper proposed a secure and energy efficient adaptive routing (SEEAR) protocol for wireless sensor networks, which is secure and energy efficient. To reduce energy, SEEAR establishes communication link between two nodes, only if the distance between these nodes is less than some threshold value and they satisfied the key criteria of Q composite keys. Literature [2] provides detailed survey of accurate localization technique [ALT]. ALT provides a pin point location information to the sensor nodes without any expense of cost or power. It also introduces the concept of location aware IDs for SNs. Ssu and Guo proposed a localization algorithm using a mobile anchor node. In their algorithm, a mobile anchor node moves around in a sensor area and periodically broadcasts beacon messages which include its current location information. A stationary sensor node receives and records the first and last locations of the mobile anchor node when its move into the communication ranges of the stationary sensor node. Literature [3] presents an energy efficient localization algorithm for wireless sensor networks using a mobile anchor node. It is based on the distance measurement with extra hardware. The mobile node is equipped with a GPS receiver, RF (radio frequency) and ultrasonic transmitter. Each stationary sensor node is equipped with a RF and ultrasonic receiver. The mobile nodes periodically broadcast its location information and stationary sensor nodes take the current position of the mobile node as a virtual anchor point. The location of a sensor node is computed by measuring the distance to the virtual anchor point using TDOA (time difference of arrival) method.

Although many protocols and algorithms have been proposed for WSNs in recent years, they may not be suitable to MWSNs. Based on IR fingerprinting and RSSI technique, we propose an enhanced triggered algorithm with a parameter of energy transmission and energy received in MWSN.

3. ALGORITHM DESIGN
In this section we introduce a localization algorithm for mobile sensor network. It is based on equation (1) and (2) represent the energy dissipation, when a SN sends or receives an l bit message .

$$E_{recieve} = l \times E_{elec} \quad (1)$$

$$E_{trans} = \begin{cases} l \times E_{elec} + l \times \varepsilon_{fs} \times d^2 & \text{if } d < \sqrt{\frac{E_{fs}}{E_{mp}}} \\ l \times E_{elec} + l \times \varepsilon_{mp} \times d^4 & \text{if } d \geq \sqrt{\frac{E_{fs}}{E_{mp}}} \end{cases} \quad (2)$$

l is the size of message i.e. packet size and taken it 64 and d is the distance. Rest of the parameters is same. And ignore the ifd part. Put the values up to d^2 and d^4 only. Graph will show the variations.

3.1. Simulation Parameters

- The field dimensions x and y in meters is taken as 100m
- X and Y co- ordinates of the sink is 0.5
- Free space attenuation coefficient (E_{fs}) is 10 pJ/bit/m^2.
- Multipath attenuation coefficient (E_{mp}) is 0.0013 pJ/bit/m^4.
- Electronic power (E_{elec}) is 50 nJ/bit.

1. Distance Estimation

Distance is estimated with the formulae is given by

- SINK NODE TO PERSON

$$di = \sqrt{(x-xi)^2 - (y-y_i)^2}$$

- GPS TO PERSON

$$d1 = \sqrt{(x-xi)^2 - (y-y_i)^2}$$ GPS TO PERSON

2. Transmit Energy Of Sink Node To Person Is Given By

Etrans2=l*(Elec+Emp*d^4

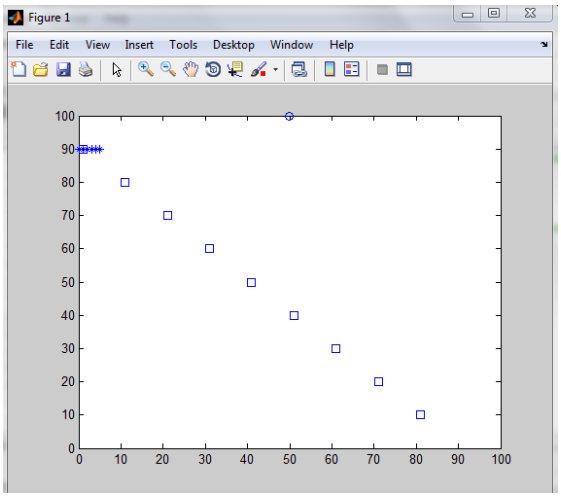
3. Transmit Energy Of Gps To Person Is Given By

Etrans21=l*(Elec+Emp*$d1^4$)

4. RESULTS

4.1 DISTANCE ESTIMATION

Distance is estimated *from* a sink node to person. fig shows person starts moving from 0 and distance of person to floor is 100 m.



Total distance estimated is 100 m

Graph of transmit energy of sink node to person is plot between sink energy and range in meters

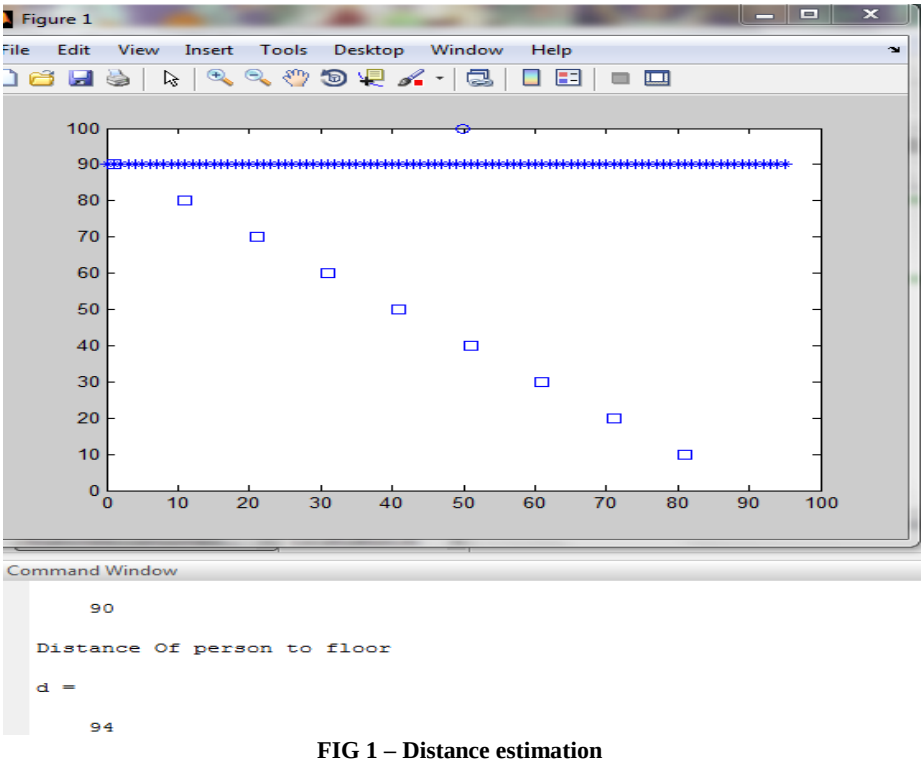


FIG 1 – Distance estimation

4.2 ENERGY TRANSMISSION AND ENERGY RECIEVED

Graph of transmit energy of GPS to person is plot between GPS energy vs range in meters

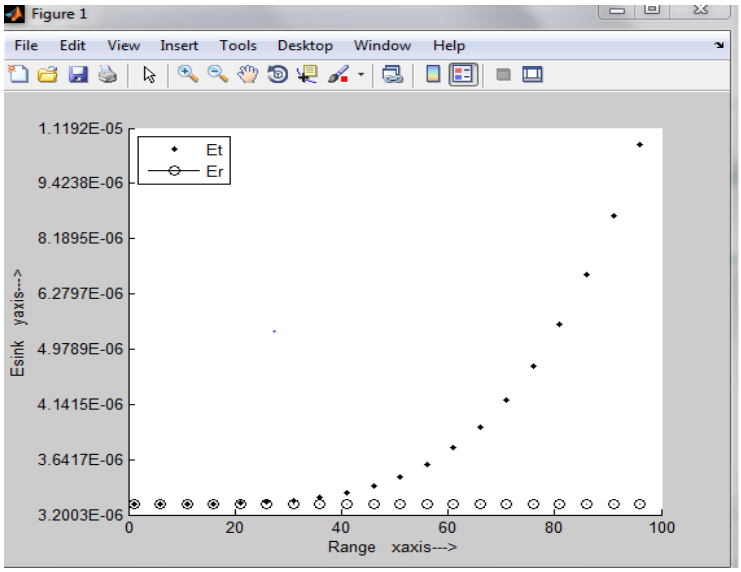


FIG 2 – Energy Transmission

here Et is transmitted energy

Er is received energy

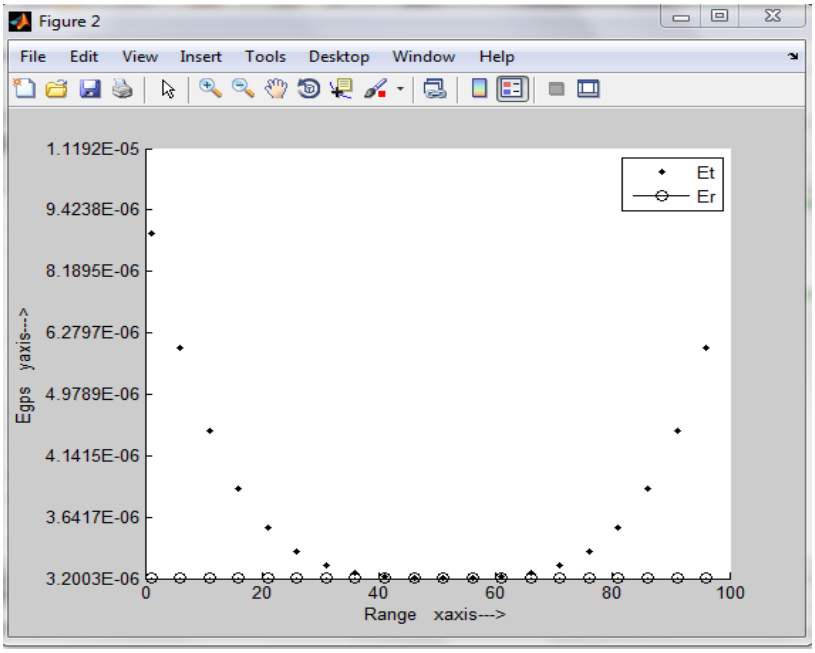


FIG 3 – ENERGY RECIEVED

These three are the results of this paper

First result is distance estimation of person to the floor

Second result is transmit energy of sink node to the person

Third result is transmit energy of GPS to the person

l is the size of message i.e. packet size and taken it 64 and d is the distance. Rest of the parameters is same. And ignore the ifd part. Put the values up to d^2 and d^4 only. Graph will show the variations.

5. SIMULATION

In this section, we discuss the simulation of our proposed localization algorithm. MATLAB with coding of WSN is adopted in the simulation.

Simulation environment

In our simulations, the sensor area is 100x100 m^2. The anchor nodes manually deployed in the area, which is equipped with GPS to obtain their

position. The mobile sensor node moves in the sensor area in any directional

6. CONCLUSION

Many wireless sensor networks require locations of sensor nodes accurately. Locating a SN in a WSN is required in most of the applications. In this paper first movement of the person on a particular floor is shown from intial position to final position as shown above in graph. Secondly , In next graph sink node energy and GPS energy is shown at a particular range this parameter is also shown above in a form of graph.

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