# Recovery of Nodes Failure in Wireless Sensor Network Using CASER Protocol and DARA:Review

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***Abstract*—**Wireless sensor networks (WSNs) are an important for monitoring distributed remote environments. As one of the key technologies involved in WSNs, nodes fault detection is indispensable in most WSN applications. It is well known that the distributed fault detection scheme checks out the failed nodes by exchanging data and mutually testing among neighbor nodes in this network., but the fault detection accuracy of a scheme would decrease rapidly when the number of neighbor nodes to be diagnosed is small and the node's failure ratio is high. an improved scheme is proposed by defining new detection criteria. Simulation results demonstrate that the improved scheme performs well in the above situation and can increase the fault detection accuracy greatly. wireless sensor-actor networks, sensors probe their surroundings and forward their data to actor nodes. Actors collaboratively respond to achieve predefined application mission. Since actors have to coordinate their operation, it is necessary to maintain a strongly connected network topology at all times. Moreover, the length of the inter-actor communication paths maybe constrained to meet latency requirement. Distributed Actor Recovery Algorithm (DARA) and PArtition Detection and Recovery Algorithm (PADRA)require every node to maintain a list of their two-hop neighbors and determine the scope of the recovery by checking whether the failed node. Cost-Aware SEcure Routing (CASER) protocol to address these two conflicting issues through two adjustable parameters: energy balance control (EBC) and probabilistic-based random walking. CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. We also proposed a non-uniform energy deployment scheme to maximize the sensor network lifetime. Our analysis and simulation will showing that we can increase the lifetime and the number of messages that can be delivered under then on-uniform energy deployment by more than four times. CASER has flexibility to support multiple routing. The main objective to have a network which gives assurance of packet delivery and give the node time to regain its so that it will be able to carry further load Packets on the network. This can be done by using shortest path. Prior work relies on maintaining multi-hop neighbor lists and predetermines some criteria for the node's involvement in the recovery. Multi-hop-based schemes often impose high node repositioning overhead and the repaired inter-actor topology using two-hop schemes may differ significantly from its prefailure status.

***Keywords*-*WSN;DARA;PADRA;CASER;EBC;Security***

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## I. INTRODUCTION

Wireless Sensor Network are designed to monitor events or environment changes sensors are spread around a chemical plant to monitor distance, forming a multi-hop self-organized network system through wireless communication. The sensors serve as wireless data acquisition devices for the more powerful actor nodes that route the sensor readings and set forward an appropriate response. Failure of Nodes may origin the network to partition into reinstate blocks and would thus violate such a connectivity requirement. The deployment of additional resources to replace failed nodes impractical and repositioning of nodes becomes the best recovery option [3].

When a nodes fails, its neighbors nodes will individually consult their possibly partial routing table to decide on the appropriate way of actions and define their role in the recovery if any. If the failed nodes is critical to the network connectivity, i.e., a node whose failure causes the network to partition into reinstate blocks, the neighbor nodes that belongs to the smallest block reacts. The target is to considerately sense, collect and process the information about objects in the nodes failure and then send it to the observer for processing and analyzing. Sensors self deployment deals with independent coverage formation in sensor network [9]. Actors are more capable nodes with relatively involved more energy supply and richer computation and communication resources. The transmission range of actors is significantly less. It is necessary for actors to rely mostly on existing radio links for coordinating themselves [11]. Distributed Actor Recovery Algorithm (DARA) and PArtition Detection and Recovery Algorithm (PADRA) require every node to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking whether the failed nodes. Cost-Aware SEcure Routing

(CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. CASER has the flexibility to support multiple routing strategies in message forwarding to extend the lifetime while increasing routing security. Both theoretical analysis and simulation will showing that CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. We also proposed a non-uniform energy deployment scheme to maximize the sensor network lifetime. Our analysis will showing that we can increase the lifetime and the number of messages that can be delivered under the non-uniform energy deployment by more than four time. CASER support secure delivery to prevent routing trackback attack and malicious traffic jamming attack in Wireless Sensor Network.

## II. RELATED WORK

Ameer A.Abbasi[3] proposed a mechanism for a failure of an nodes may cause the network to partition into blocks. One of the effective recovery methodologies is to autonomously reposition a subset of the actor nodes to re-establish connectivity. Recovery schemes either impose high node relocation overhead. To overcomes these shortcomings and presents a Least-Disruptive topology Repair (LeDiR) algorithm. LeDiR relies on view of a node about the network to invite a recovery plan that relocates the least number of nodes and ensures that no path between any pair of nodes is extended.

G.Wang[6]Sensor deployment is an important issue in designing sensor networks. This evaluates a distributed sensor Protocols for mobile sensors. After discovering coverage holes the protocols calculate the position of sensors where they should move. The protocols that provide high coverage within a limited deployment time and limited movement. We use Voronoi diagrams to discover the coverage holes and design three movement-assisted sensor deployment protocols, VEC (VECtorbased),VOR and Minimax based on the principles of moving sensors from densely deployed areas to sparsely deployed areas.

S.Yang[7] study the proficiency of sensor networks depends on the coverage of the monitoring area. The good sensors deployment necessary to balance the workload of sensors. The deployment of movement assisted sensor deals with moving sensor deals with moving sensors from an unbalanced state to a balanced state. The various optimization problems can be defined to minimize different parameters, including total moving distance, total number of moves, communication/ computation cost, and convergence rate. The SMART is developed to use scan and dimension exchange to achieve a balanced state and to address a unique problem called communication holes in sensor networks.

Y. Zou and K. Chakrabarty[8] cluster based distributed sensor deployment. A virtual force algorithm(VFA)as a sensor Deployment strategy to enhance the coverage after the placement of sensors, VFA attempts to maximize the sensor field coverage. Once the effective sensor positions are identified. The one time movement with energy consideration incorporated is carried out i.e., the sensor are redeployed to these positions. The positioning of sensors affects coverage, communication cost and resource management. The positioning of sensors affects given number of sensors within a cluster in cluster based DSNs. For a given number of sensors, the VFA algorithm attempts to maximize the sensor countryside coverage. We also propose a novel probabilistic target localization algorithm that is executed by the cluster head to query only a few sensors (out of those that report the presence of a target) for more detailed information.

X. Li[9] achieving focused coverage around a Point of Interest, and introduce an evaluation metric, coverage radius. The self deployment sensors is an important research that deals with self directed coverage formation in mobile sensor network. The two purely localized solution protocols Greedy Advance (GA) and Greedy-Rotation-Greedy(GRG), which are rigid to node failures and work regardless of network partition. The algorithms drive sensors to move along a locally-computed triangle tessellation(TT) to surround the Point of Interest. In Greedy Advance, nodes greedily keep as close to the Point of Interest as they can; in GRG, when their greedy advance is blocked, nodes rotate around the POI to a TT vertex.

## III. MOTIVATION

The main aim is to detect the failure nodes and recover the failure nodes. To achieve a high message delivery ration. Our routing protocol should try to avoid message dropping by multiple node path when an alternating routing path exists and recover and to balance the energy consumption and increase network lifetime. Our analysis showing that we can increase the lifetime of wireless sensor network

## IV. PROBLEM STATEMENT

Considering such a problem with collocated node failure is more complex and challenging in nature. to investigate this issue. Also includes factoring in coverage and ongoing application tasks in the recovery process and developing a test bed for evaluating the various failure recovery schemes.

Sensing and data processing are essential WSNs have many more nodes and are more densely deployed Hardware must be cheap; nodes are more prone to failures WSNs operate under very strict energy constraints

Node failures are very improbable unless a part of the deployment area includes factoring in coverage and ongoing application tasks in the recovery process and developing a test bed for evaluating the various failure recovery schemes.

Probability for multiple nodes to fail at the same time is very small and would not be a concern the smallest block inward toward the failed node; it may negatively affect the node coverage.

## V. PROPOSE WORK

Recovery of network failure is very time consuming and complicated. We have to generate combinational methodology to improve and enhance in the existing technique. To propose the fast recovery and assurance of data packet delivery. In multiple nodes failure recovery with cost aware efficiency CASER support multiple routing strategies. Our propose protocol detect multiple faulty nodes and provide security. In fig.1 Let us assume that number of other failure occurs during the recovery process and s is the maximum time required for a node to find whether it belongs to the smallest block. The nodes C and E are fail then find out the smallest block basically, a nodes that replace with smallest block will have to check the column for F in the Log to identify all the other d-1 neighbors. All nodes those are reachable through them from its row in SRT. This step is applied at most N-1times in a network. To determine whether is block is the smallest node A will repeat this process at most d-1 times for the other neighbors. Thus the maximum time S for a node to identify the smallest block i..

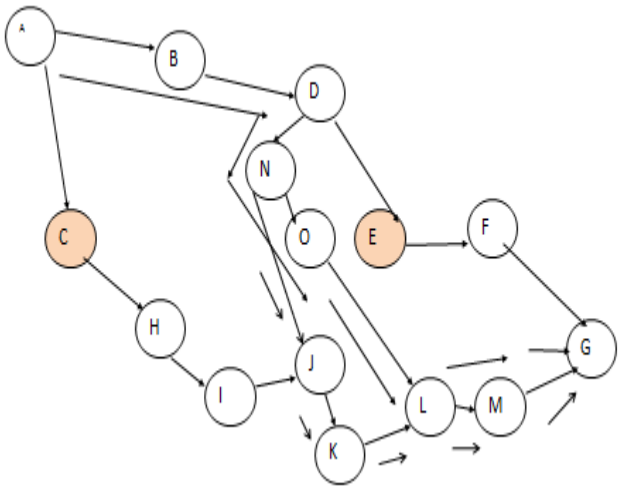


Figure 1. Detection of Faulty Nodes and apply Recovery Scheme

In fig 2. When the node N(s, 1) moves to replace c and E, the links to Neighbors(N(s, 1)) are maintained. If a neighbor N(s, t) of N(s, 1) was also a neighbor, the link between N(s, t) and N(s, 1) is not affected nodes effected. Otherwise, N(s, t) travels toward G to stay directly connected to N(s, 1). Cascaded relocation also ensures that every node stays connected to all its neighbors. To maintain prefailure connectivity, a node that needs to move selects a new location that keeps it reachable to all its parents affected nodes the recovery. Since the motion of nodes in Bs is inward toward G, it has the effect of shrinking Bs toward node G, and the links of a node to its siblings are maintained. In this way it will recover the nodes.

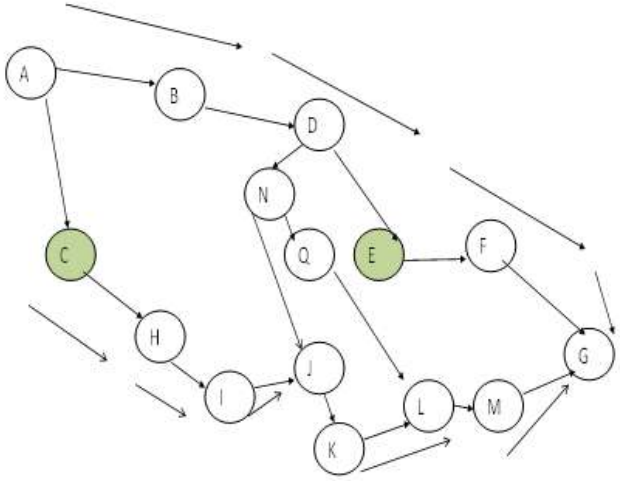


Figure 2. Faulty Nodes Recovery

1. DARA 1-C maintain the neighbor list. It requires that each actor should keep its neighbors information in the network Maintains Neighbor Lis:when they change their position the Neighbors list should be updated. Neighbors information maintained in the table consist of three parameters :node degree, position, ID.

2.Detecting Failure nodes and Initiating the Recovery Process that depending on the actor's position in the network topology.We focus on restoration of inter actor connectivity.

3.To select best candidae which is having least node degree to move a node with larger number neighbors has greater impact on network.

4. DARA2-C to focuses on restoring connectivity after the failure of an actor. The main is to recover from the failure of a boundary node.

5. In order to minimize the travel overhead the nodes distance should be minimize, the closest candidate to failure of nodes $A_f$ among those having the least node degree.

6. The BC actor, will notify all its neighbors that it is moving and tell them where it intends to reposition.

7.PArtition Detection And Recovery PADRA to determine the scope of recovery by checking whether there are failed nodes. It give information to CASER that nodes have recovered or not.

8.CASER has an excellent routing performance in terms of energy balance and routing path distribution for routing path security. The main objective to have a network which gives assurance of packet delivery

## VI. CONCLUSION

In this project, we propose a secure and efficient Cost-Aware SEcure Routing (CASER) protocol for WSNs to balance the energy consumption and increase network lifetime. Our analysis and simulation to showing that we can increase the lifetime of wireless sensor network and Distributed Actor Recovery Algorithm (DARA)and PArtition Detection and Recovery Algorithm (PADRA)require to maintain a list of their multi-hop neighbors and determine the scope of the recovery by checking whether the failed nodes. It also provide the assurances to packet delivery. CASER has flexibility to support multiple routing. The main objective to have a network which gives assurance of packet delivery and give the node time to regain its so that it will be able to carry further load Packets on the network. This can be done by using shortest path. Prior work relies on maintaining multi-hop neighbor lists and predetermines some criteria for the node's involvement in the recovery. Multi-hop-based schemes often impose high node repositioning overhead and the repaired inter-actor topology using two-hop schemes may differ significantly from its prefailure status

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