

# A Survey on Multifaceted Measuring for Clone Detection in Internet of Things

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**Abstract** – In the smart world the electronic devices will perform the daily day human activities in the smartest way. The technology is making the home as “smart home system”. This Smart System is achieved by using Internet of Things technology. This technology is the most powerful tool in the network, the major drawback of this Internet of things devices is that it can be cloned easily by accessing the authentication credentials of the authorized person by non-manipulate node, and reproduce in the network. In this paper, we have the method for clone detection based on multidimensional scaling(MDS). It detects the clone in the both static and mobile network means it can perform on hybrid network and it also detects the clone without knowing the geographical positions. The major advantage is the detection algorithm can be parallelized. It is optimistic method for detecting clone in the Internet of Things(IOT).

**Keywords:** Multidimensional scaling, clone detection, geographical position

## 1. INTRODUCTION

Internet of Things is the most rising networking prototype, in which it helps to communicate with large number of interconnected devices, and nowadays the Internet of things(IoT) devices will help to connect the person and objects to communicate with each other and the information exchange between the the person and object is collected in the centralized system and then the requested task is performed. For example, smart home system has many home appliances devices, and these devices are connected to the centralized system and the operations of the devices are controlled by the mobile device of the authorized person. The centralized system will mediate between the object and person.

The IoT consists of many sensors to collect the information of the environment, these sensors will form the network that is “Wireless Sensor Network” which will be gathering the status of the environment. The main drawback is that the IoT devices can be snare effortlessly this will result in “clone attack” (node replication attack). In such situation the cloned device is modified and put to the network. The clone attack can lead to data loss, data manipulation etc. sometimes due

to the malicious data the system can led to failure or system crash.

The main idea of the paper is to detect this clone attack and protect the confidential data. The clone attack is detected, the multidimensional scaling(MDS) algorithm which will help us to detect that where is the clone has occurred. Here the MDS algorithm will create the network map based on the relative neighbour distance information of the nodes. Meanwhile each node will be aware of its geographical position when some new node is added to the network then this algorithm will identify the node and then inform to the Base station so that the requested data is forwarded from other network route.

The proposed system can able of identifying the clone in the network based on topology manipulation, by not considering any mobile pattern. The system is accurate in any network topology, means in the existing system the clone detection algorithm works on static or mobile network, For example, in the smart hospital system the patients are able to install the wearable sensors to their body to monitor the body condition, and here the patient move around the location is changed rapidly so the patients are consider as mobile networks. In smart home system the IoT devices which consists of sensors is not moveable so the network is static there, in the existing algorithm the efficiency of clone detection is not same for the both networks, the performance is different for the networks in the proposed algorithm it works good on hybrid network (static and mobile network).

## 2. RELATED WORK

The Internet of Things is the powerful tool to tackle any task by using some sensors and system to operate on the device in the particular environment. The technology which help us to monitor the status of the health of the person is the “Body Sensor Network” (BSN). Here the sensors are placed inside the human body and the sensors are monitor the human body status and collect the information. Nowadays the mobile healthcare and smart cities are the two trending topic

in present technology, In this article it talks about the mobile health within smart cities, the communication and information technology in health care which led to the best result is electronic healthcare. The smart cities are strongly based on the sensors that gives the updated information like temperature, traffic, pollution etc. by this information we can figure out the status of the people or patients environment, by this information we provide the patient with the healthcare application and services with the active context awareness, means the application and services automatically the accommodates discovered context. The main idea of this paper to make the people or patient health condition better using m-health with in smart cities. [1]. And in our idea this will help us to find the environmental condition of the nodes in network which will identify the distortion in the topology that will help us to detect the clone node in the network or to check whether the clone is occurred or not in the network.

Wireless Sensor Network is the leading area in research, here sensor devices which play the main role to collect some type of input from physical and environmental condition like pressure temperature etc. and the output of these sensor devices are electronic signal then that signals are transmitted to the next process. These wireless sensor network made out of very negligible efforts, low control sensor hubs. As all know these sensors are used to gather or transmit the information to the destination node (communication purpose). This type of communications will make the network endangered to various attacks by these attack the hacker can get the confidential information of the node can reprogram or replicate the node and place that node in the network to access the data. The paper will help us to find the replicated node in the network [2]. In our paper it will help us to find the replicated node in the network (path from source to destination node). The localization algorithm is used to obtain the location of the object(nodes) in the network to obtain this location we use ZigBee, Bluetooth etc. technology here to obtain the location we use two phases first one is the partition phase here we split the target region into small grids and the second phase is that refinement phase here we get the higher accuracy of localization can be obtained by applying the algorithm [3]. And this localization algorithm is also used to detect the replication node in the mobile sensor network. The main advantages are it is localized detection, more efficient and effectiveness, network wide synchronization are avoided, network wide revocation is avoided. This will help our paper to detect the node which is replicated or cloned in the mobile sensor network [4][7]. The node replication detection in distributed system works efficiently [8].

The mobile nodes are moveable, means it is not static, for example body sensor network(BSN) which is installed in the patient's body to monitor the health condition of the patient and monitoring the condition like blood pressure, temperature etc. and these information are send to the base station means the smart hospital system to send the information the sensors will communicate with the relative neighbour then send the information to the smart hospital system, and finally form the distance matrix between all pairs of nodes (sensors). The first step is to generate the dot product of the matrix for each node having any particular mobility pattern this makes our paper more realistic because of the mobility pattern of the node (wearable sensors) [2]. In this situation here the device to device communication is necessary to obtain the updated information of the node in the network to achieve this device will communicate with each other intelligently without any centralized control [5][3]. The path from source to destination node is created using MDS algorithm from the source to destination it creates the network map by using the neighbour node means the wireless sensors in the network (node) and through this network map only the data is transferred to the destination node [6].

### 3. PRELIMINARIES

The main aim is to detect the clone nodes in the network using MDS algorithm. Initially here we here the network map are generated based on the relative neighbour nodes. This MDS algorithm is basic approach of the proposed system.

#### A. Multidimensional Scaling

Multidimensional Scaling(MDS) is the best technique which create a map showing the comparative positions of the object on the network which gives the distance between the nodes. And finally form the distance matrix between all pairs of nodes. The outcome of the algorithm is the distance matrix in one, two or more dimensional matrixes. This will help us to find distance from node to node and calculate the distance matrix for the network. This matrix will help to create the network map. Which is further will be used to send the information from source to destination node. And if there is any node is added in the network the MDS algorithm will find the cloned node in the network.

#### B. Localization via MDS

The localization algorithm is the technique which takes the subset of pair-wise distance of nodes as input and produce

the correlates of the node in the network. The main difference between the MDS and MDS-MAP is that the MDS calculation imagine that the Base Station(BS) is aware of all the pairwise distance of nodes but this assumption is not pragmatic in wireless networks. The MDS-MAP is the concept which combines the MDS and shortest path operation from graph theory. When the node a and b are far away from each other, and a cannot reach b by the obtained distance then the Base station(BS) obtain the approximate distance from a to b using shortest path. By this approach the base station can obtain all the pairwise distance and these pairwise distance are approximate, then using this pair wise distance we will derive the coordinate matrix, then attain the localization. The approximate distances are given to the MDS as input this may cause some malformation in recreating the coordinates. The nodes will collect the distance from its neighbour nodes, and these distances are updated to the base station(BS). Then the base station will use the MDS-MAP to recreate the coordinates as the nodes and then generate the network map.

#### 4. CONCLUSION

The proposed system a clone detection called Multifaceted Measuring for Clone Detection in Internet of Things which uses the MDS algorithm for any hybrid network. Here the paper has considered some of the specific features of the IoT devices to design the clone detection method i.e., it not aware of the geographical positions, and works good on both static and mobile network. The Multifaceted Measuring for Clone Detection in Internet of Things is the best approach because this is the first method that supports hybrid network, and its communication cost is affordable, and its best part is it is location independent method.

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