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Estimation of Harvested Energy from the Traffic Patterns Associated with Nodes

T.Augusty Chandija Lincy[1] and Mrs D.Regi Timna[2]

[1]PG Scholar, Department of Electronics and Communication Engineering, Francis Xavier Engineering College, Tirunelveli, India.
[2]Assistant Professor, Department of Electronics and Communication Engineering, Francis Xavier Engineering College, Tirunelveli, India.
Email: lincythavasiraj@gmail.com[1] and regitimna@gmail.com[2]

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ABSTRACT

Collaborative spectrum sensing (CSS) was visualize to improve the reliability of spectrum sensing in centralized cognitive radio networks (CRNs). A popular attack in Collaborative Spectrum Sensing is the called spectrum sensing data falsification (SSDF) attack. There will be a punishment strategy which is present to see the reputation method, in which the honour factor and the retribution factor are introduced to give SUs to given in positive and honest sensing activities. There will be a punishment strategy which is present to see the reputation method, in which the honour factor and the retribution factor are introduced to give SUs to given in positive and honest sensing activities. Harvesting energy from ubiquitous radio frequency (RF) signals in urban area is environmentally friendly and self-sustaining. Here Proposed a threshold-based framework for optimal spectral access strategy and show that the threshold is optimal and traffic-dependent. The proposed threshold-based strategy takes into account both the spectral access and energy harvesting opportunities provided by a particular traffic application. Also an iterative algorithm is used that selects a threshold which maximizes the SU transmission opportunity subject to the overall harvested energy budget. Further, we illustrate the effects of different Harvesting energy for the Primary users and the illerate algorithm is used here.

Keywords: Collaborative spectrum sensing, spectrum sensing data falsification, Fusion centre, Malicious Users, Secondary Users, Radio frequency.

1. INTRODUCTION

Cognitive Radio networks can change its parameters by the sensing of the spectrum. It determines the vacant bands, and makes use of these available bands in an opportunistic manner, improving the overall spectrum utilization. With these capabilities, cognitive radio can operate in licensed as well as unlicensed bands. In licensed bands wireless users with a specific license to communicate over the allocated band (PUs) [1], have the priority to access the channel. In the Cognitive Radio Network Sensing-based Spectrum sharing is used but there are many types of radio network. In the Spectrum Sensing that there will be a First the Primary users detect the licensed spectrum and the time allocated for the licensed spectrum. There is also a another positive approach that during the spectrum analysis there will be energy harvested during the transformation of spectrum from one node to another.

Section 2, the Identification of problems formulation related to the existing methods. Section 3 presents detailed description of proposed techniques for solving plant related issue. Experiment results and discussions are described in Section 4. Finally, the conclusion and further enhanced are given in Section 5.

PROBLEM DESCRIPTION AND PREVIOUS WORK

In the DSA Networks paper the cooperative spectrum sensing is used in a distributed DSA network under SSDF attack. In the proposed system. The trust models used here is Beta distribution and Dirichlet distribution. Beta distribution which assigns the trust values to the neighbor nodes at in a different time slots. Dirichlet distribution is able to incorporate uncertainty in the trust values. But It is not linearly separable. In the DSS network the only efficient spectrum is used here [2-12]. In this models is to share their licensed spectrum or is to reallocate other spectrum in the allotted bands. In the Adaptive modulation schemes is to enable coexistence, interference mitigation, Frequency, space, time cognizant protocols But It Should embrace more dynamic models of spectrum sharing. A Bayesian inference model based on propose of two reliability models: an optimistic one for a normal system and a conservative one for a mission critical system.

The main advantage is Reliability may be caused by temporal But it has no strict convergence on the decision reliability is achieved. In the spectrum sharing, a spatial separation region is defined around primary users to protect them from secondary user induced interference [13-28]. This protection region called as an exclusion zone or a protection zone . EZs are the primary ex-ante spectrum enforcement method used by regulators to protect the incumbents from SU-induced interference. The concept of Multitiered Incumbent Protection Zones

2. PROBLEM IDENTIFICATION AND SOLUTION

2.1. Introduction

Keeping in mind the end goal to recognize and shield against the confused assault conduct of vindictive clients all the more successfully and quickly [29-33], this paper proposes a novel notoriety based security instrument. In the instrument, each SU is assigned a persistently refreshed thorough notoriety (CR) esteem by the FC as per its announced detecting information.

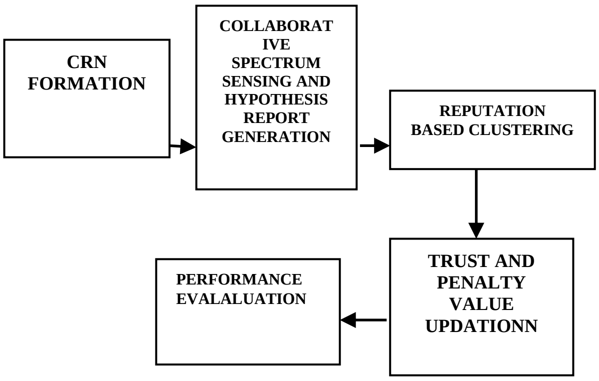

CRN FORMATION
COLLABORATIVE SPECTRUM SENSING AND HYPOTHESIS REPORT GENERATION
REPUTATION BASED CLUSTERING
TRUST AND PENALTY VALUE UPDATIONN
PERFORMANCE EVALALUATION

Fig 1. Block diagram of proposed work

The CR esteem assesses the unwavering quality and accuracy of the individual client's detecting information sent to the FC. Higher notoriety implies that the client's detecting information in the past are more helpful for the FC to settle on the privilege worldwide choices. The CR esteem is an imperative reference in the following detecting round. The far reaching notoriety fundamentally considers four affecting components of client dependability, including current unwavering quality, authentic notoriety, remunerate factor and discipline factor. A malevolent client gets low notoriety and combination weight because of submitting distorted detecting information, and the FC debilitates its unsafe impact during the time spent information combination or straightforwardly disregards its detecting comes about. The far reaching notoriety sufficiently measures and mirrors the unwavering quality of individual detecting comes about for subjective clients in a suitable time scale and is always showed signs of change and refreshed.

2.2. Historical reputation

The notoriety is the subjective likelihood forecast of the subject concerning whether the question can finish a specific cooperative movement accurately and non-devastatingly, and recorded detecting conduct mirrors the dependability variety of intellectual clients. With a specific end goal to feature the recorded conduct of SUs in the part of notoriety assessment, we present the chronicled notoriety.

2.3. Punishment Strategy

Since security has assumed a noteworthy part in CRNs, various research works have chiefly centered around assault identification in view of discovery likelihood, yet few of them took the punishment of assaults into thought and dismissed how to execute successful correctional methodologies against assailants

2.4. Penalty factor

The punishment scheme follows a habit of human society, that is the initial criminal punishment is light, and the cumulative crime will be punished heavily. Therefore, the greater the threat is, the more serious of a punishment should be imposed.

2.5. Harvested energy budget

We accept that SU shrewdly gets to a PU channel. Other than conventional data decoder (ID), each SU is furnished with a RF vitality gatherer (EH) that can separate DC control from the got electromagnetic waves

3. RESULT AND DISCUSSION

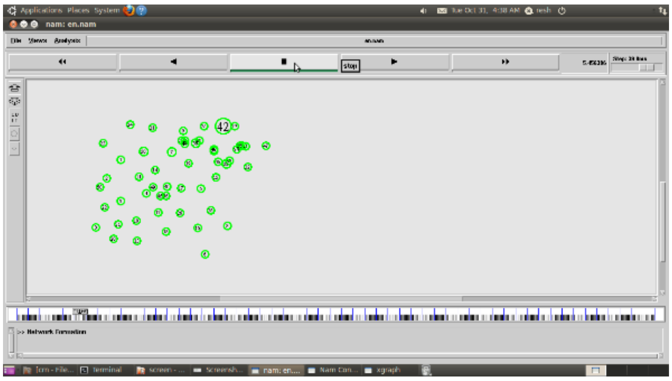
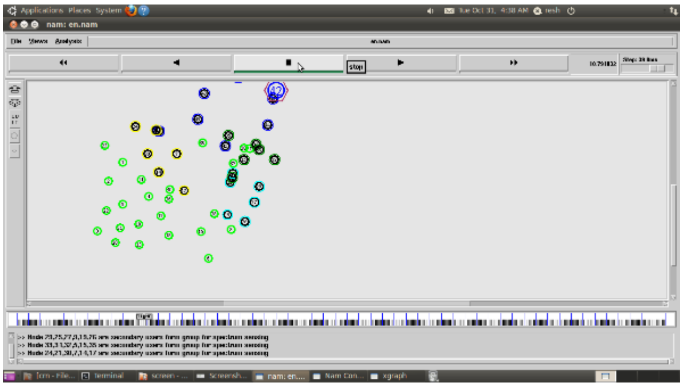


Fig 2: CRN FORMATION

Fig 2 Node Deployment: shows that 71 nodes were created and node deployed at the area of 1700 1700 which has simulation time of 55 seconds. Thus network was created in cognitive radios.



```
>> Node 29,25,27,0,19,26 are secondary users form group for spectrum sensing
>> Node 33,31,37,5,15,35 are secondary users form group for spectrum sensing
>> Node 24,21,30,7,14,17 are secondary users form group for spectrum sensing
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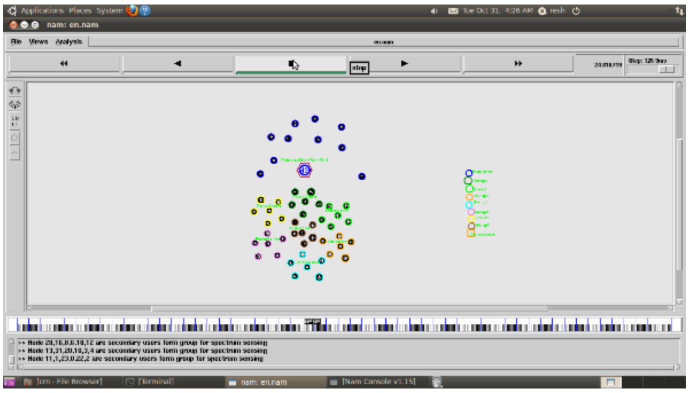
Fig 3: Separation of primary users and secondary users

Fig 3 shows that node 42 represents the fusion centre which decides the availability of spectrum in accordance with the free bands in both primary and secondary users. In this dark blue color nodes comprises a single group of primary users. The remaining nodes forms seven individual group of secondary users.



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>> Node 28,16,8,6,18,12 are secondary users form group for spectrum sensing
>> Node 13,31,20,10,3,4 are secondary users form group for spectrum sensing
>> Node 11,1,23,0,22,2 are secondary users form group for spectrum sensing
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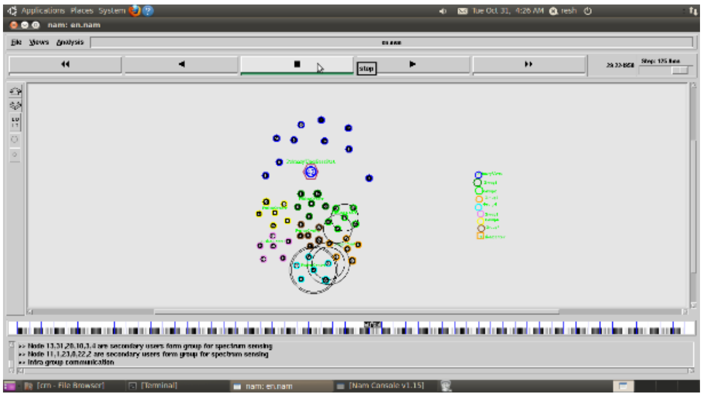
Fig 4: Initialization of trust value

Fig 4. This shows that the trust value is set to be 0.5. The nodes which have this trust value forms a group which belongs to the fusion centre. Rather nodes will be considered as a malicious users.



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>> Node 13,31,20,10,3,4 are secondary users form group for spectrum sensing
>> Node 11,1,23,0,22,2 are secondary users form group for spectrum sensing
>> Intra group communication
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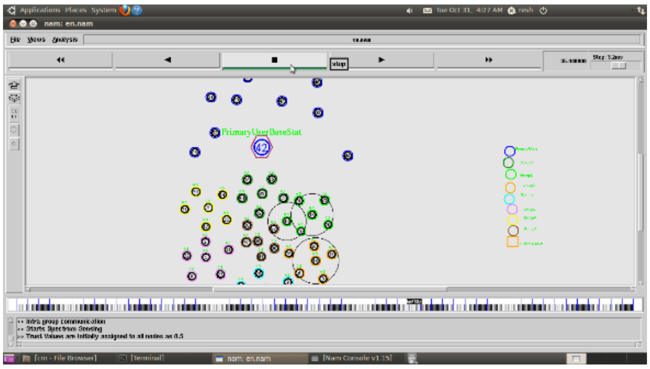
Fig 5: Intragroup communication

Fig 5 Based on the grouping of nodes there will be a colouring occurs. So that there will be a intragroup Communication Occurs and there will be a fusion centre act as a base station. So that there will be a Communication occurs between the nodes.



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>> Intra group communication
>> Starts Spectrum Sensing
>> Trust Values are initially assigned to all nodes as 0.5
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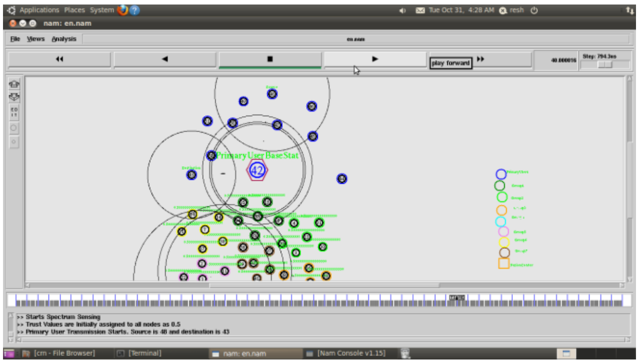
Fig 6: Starts spectrum sensing

Fig 6 shows that trust values are assigned to all the nodes as 0.5; Intragroup communication has been done between the users and starts spectrum sensing.



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>> Starts Spectrum Sensing
>> Trust Values are initially assigned to all nodes as 0.5
>> Primary User Transmission Starts. Source is 48 and destination is 43
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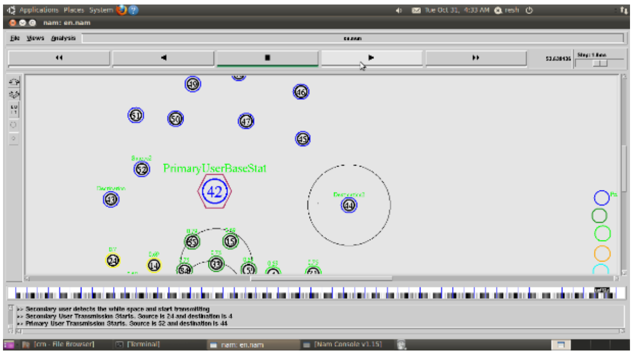
Fig 7 : Assigning source and destination

Fig 7 shows that the transmission starts between primary users thereby assigning source node as 48 and destination node as 43 and it is changeable for each and every primary users in order to data transmit. At the same time secondary users sends its spectrum sensing to the fusion centre.



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>> Secondary user detects the white space and start transmitting
>> Secondary User Transmission Starts. Source is 24 and destination is 4
>> Primary User Transmission Starts. Source is 52 and destination is 44
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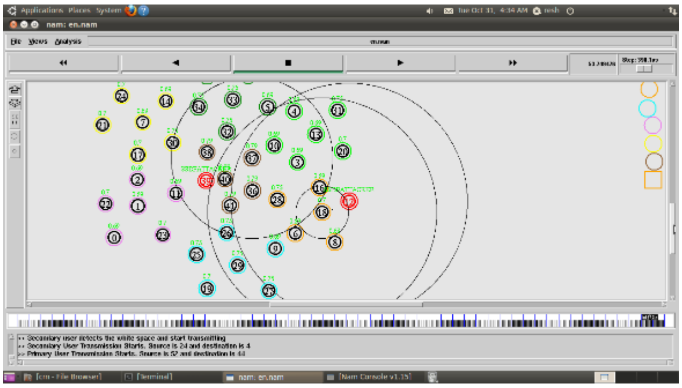
Fig 8: Transmission between primary users

Fig 8 shows that the primary user detects the free space and assign the source and destination for the second time for 52 and 44 nodes.



```
>> Secondary user detects the white space and start transmitting
>> Secondary User Transmission Starts. Source is 24 and destination is 4
>> Primary User Transmission Starts. Source is 52 and destination is 44
```

Fig 9: SSDF attacker

Fig 9 shows that the trust value updation for every node and based on the updation the reward and penalty factor is assigned. Based on the penalty factor the SSDF attacker node is identified

3.1. SIMULATION GRAPHS

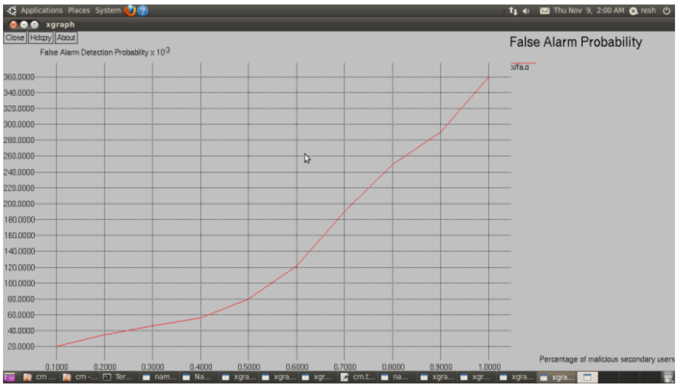


Fig 10: False alarm probability

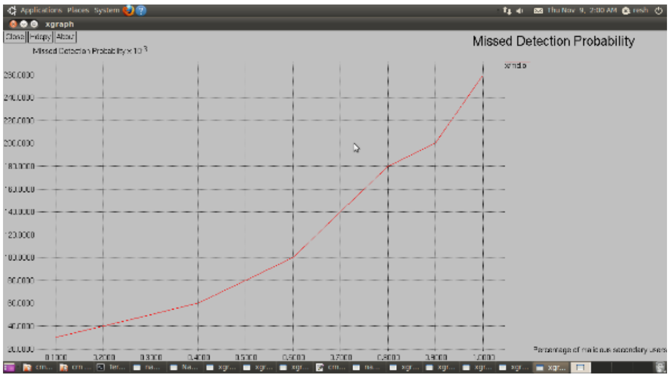


Fig 11: detection performance

Fig 10 shows the false alarm probability. The always opposite attack strategy refers to the attack mode that MUs report after reversing the local decision result. Figures present the cooperative sensing performance under SSDF attack. The horizontal axis accounts for the proportion of malicious users. The vertical axis in Figure represents the global false alarm probability Qf , and the vertical axis in Figure represents the global misdetection probability Qm. It can be seen from the Figures, when there is no malicious users in the network, the optimal sensing performance can be achieved if K cognitive users are reliable nodes.

Fig 11 shows the detection performance. The detection performance , in which K - N0 RNs participate in the collaboration, is inferior. The detection performance of the scheme with no reputation mechanism dropped dramatically under the AO attack pattern, which means it is indispensable for CRNs to adopt a necessary and effective security mechanism to defend against various types of spiteful attack behaviors. When the number of MUs exceeds half of all cognitive users, the sensing performance is even worse than that of random guessing. The proposed system achieve the equivalent performance of K - N0 reliable nodes, meaning that they can availably identify the malicious SUs and eliminate their harmful effects via only using reliable reported results for fusion decision making.

4. CONCLUSION

Generally trust is defined as a belief level that one sensor node puts on another node for a specific action according to previous observation of behaviors. That is, the trust value is used to reflect whether a sensor node is willing and able to act normally in WSNs. In this paper, a trust value ranges from 0 to 1. A value of 1 means completely trustworthy and 0 means the opposite. In future we will consider recommendation trust, direct trust and indirect trust models for further calculating SSDF attack efficiently. Direct trust is a kind of trust calculated based on the direct communication behaviors. It reflects the trust relationship between two neighbor nodes. Recommendation trust is defined as the calculation of trust based on recommendations from neighbor nodes. An efficient mechanism is used to filter the recommendation information. The filtered reliable recommendations are calculated as the recommendation trust. The indirect trust value is gained based on the recommendations from other nodes.

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