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Comprehensive use of Social Network Analysis for Terrorist Network Mining

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Abstract:

Terrorism is becoming a major threat to the security and integrity of every nation. In the era where many countries are equipped with nuclear warheads, the traditional war between countries is distant reality. The greatest security threat facing the countries like India is not from other countries, but from terrorist organizations that attack informally, using terror at any time and place[1]. The war against such proxy war can no longer be fought with structured battle that with military power but it can only be won with superior knowledge. Terrorist network mining has emerged as a novel field of research often applied to investigation of organized crimes. Relationship among terrorists form the basis for the organized crimes and are essential for smooth operation of a terrorist organization which can be viewed as a network where nodes represents terrorists and links represent relationships or associations between terrorists.

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Literature Review

1. Hopkins in the "Graph Theory, Social Networks and Counter Terrorism" elaborates the usage of graph theory as social analysis tool for the terrorist network mining. Author also explains in detail different parameters to analyze network like clustering, associativity, and centrality measures[1].
2. Memon and Larsen in the "Structural Analysis and Destabilizing Terrorist Networks" mentioned about three characteristics about any network viz Cohesion analysis, Role analysis and Power analysis. Cohesion analysis through cohesion index helps in identifying how closely all the elements of the network are connected. Role analysis consists of Network Efficiency E(G), Critical component of a network, and position role analysis. Through degree centrality and eigenvector centrality, power analysis of the network can be done[2].
3. Azad and Gupta in the "A Quantitative Assessment on 26/11 Mumbai Attack using Social Network Analysis" explain the case of 26/11/2008 Mumbai terrorist attack from the perspective of terrorist network mining[3].
4. Authors have created adjacency matrix of different actors like Abu Kaahfa, Wassi, Zarar, Hafiz Arshad, etc.
5. Several measures of centrality such as degree, betweenness, closeness and eigenvector were calculated for Mumbai terrorist attack and observations were deducted.
6. Chaurasia and Tiwari in "Efficient Algorithm for Destabilization of Terrorist Networks" introduced content based terrorist detection methodology (CBTDM)[2].

Problem Definition

In the research involving the use of Social Network Analysis in Terrorist Networking Mining, the researchers are using the graph theory parameters like betweenness index, centrality etc for understanding Terrorist Networks. The proposed model will use the graph theory parameters like betweenness index, centrality and an additional parameter called Eigen vector. This parameter measures the influence of a node in a network[4].

Moreover the researchers have used ready-made tools available in the market for drawing the Multi-dimensional scaling visualization graph of Terrorist Network Mining. In the proposed model, a customized visualization tool will be designed and developed to cater the needs of this specific application.

The noise reduction technique that is used in existing research is the simple filtering technique. In the proposed research new optimized noise reduction algorithm will be developed depending on various crucial parameters like strength and influence of the node on the network.

In the critical analysis of this research with the existing available tools will be done to justify the results of the proposed model.

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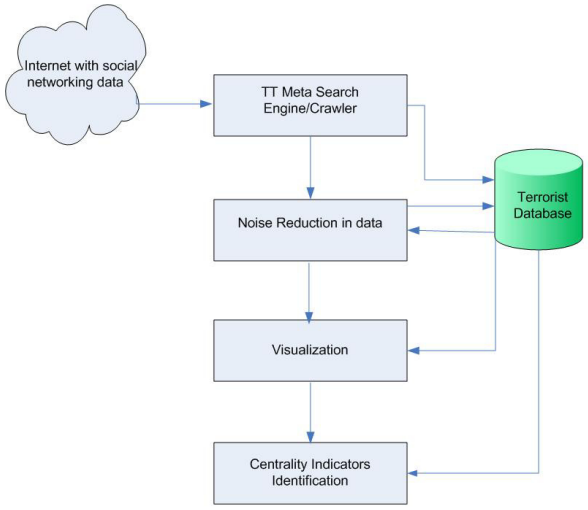
System Model



Objectives of Research

1. Develop crawler for effective search of terrorist data on social network
2. Develop noise reduction algorithm for filtering database
3. Develop excellent visualization tool for security agencies
4. Develop terrorist analyzer to predict role & responsibilities of all the organizations involved

Effect of Proposed Model

The outcome of the research will help in identifying the major groups of terrorist organizations operating in India and their linkages among each other.

Using modern discrete combinatorics, researcher will able to identify different players from these terrorist organizations along with their role in the network.

The system developed during this research will be useful for systemic analysis based either on open or intelligence (classified) data.

Impact of the proposed model on the society

Terrorism is a kind of disease for human society. The proposed system will help us in identifying

the key players/key terrorist organizations in the Terrorist Networks, so that the removal of these key organizations will help in destabilizing the terrorist Network. Moreover once the key organizations are identified, this will help in understanding the communication patterns exhibited by these Terrorist organizations. So, the operations undertaken on these organizations can be performed in more organized manner for greater impact.

Conclusion

1. As a part of research, we will develop a model using Social Network Analysis for understanding and decoding the Terrorist Network Mining.
2. The proposed research will help government agencies for destabilizing the Terrorist Network in an organized way.
3. Hence the proposed research can help developing a terror-free society.
4.

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