MODELING OF SOCIAL, COMMUNITY AND INTELLIGENCE MODEL IN WIRELESS NETWORK

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ABSTRACT

The social community and intelligence can be described as an emerging research field that leverages the capacity to collect and analyze these footprints to reveal human behaviour patterns and community dynamics. The model for SCI is being research for see if the SCI must have their model or the SCI just self organizing network. The model from social mobility, community mobility and intelligence model are being research to saw if SCI can have the model. The models are be chosen is the Random Waypoint for social network, the Nomadic Community Model for community model and the Minsky Model for intelligence model. The models are being research in four parameters which are contact time, end to end delay, direction of movement and autonomous gossiping. These parameters are being chosen because it related to the pattern of behaviour of human live and community dynamics. These parameters are being simulated in NS2 version 2.34 simulators. The simulation also is done with AODV routing protocol and wireless environment.

Keywords: social mobility, community mobility, intelligence mobility, simulation, NS2

1. Introduction

The increasing of user in internet and web technologies, the prevalence of rich media contents, and the ensuing social, economic, and cultural changes, computing technology and applications has evolved guickly over the past decade. The Social and community intelligence (SCI) can be described as an emerging research field that leverage the capacity to collect and analyze these footprints to reveal human behavior patterns and community dynamics. The technology is growing very fast, they now go beyond personal computing, facilitating collaboration and social interactions in general (Fei Yue Wang et al, 2007). The SCI system can make such information available by analyzing pervasive data streams collected from personal mobile phone sensors, GPS devices on buses, WLAN or Bluetooth gateways inside a building and internet applications such as online networks (Zhang et.al, 2011). By 2011, four billion of the worlds of mobile devices [www.digitalbuzzblog.com] were used by people in the world every day. Mean that most people are using mobile device to get the latest information and fastest way. Meanwhile, internet services like instant messaging, e-mails, social networks like Facebook, MySpace, Twitter and WhatApps record information about people's relationship and preferences. The scale and heterogeneity of the multimodal, mixed data sources present us as an opportunity to individual's daily life facets, radically change the way we build computational models of human behavior, and enable completely innovative services in areas like transportation

management, and environment monitoring. Again SCI is one field which emerging that aims at revealing the pattern of individual group and societal behaviors.

The SCI differs from the other research areas such as in social computing, urban computing, and reality mining and human centric sensing because it explores the fusion of three data sources, not just one source. SCI has three main data sources that are multimodal and heterogeneous, which includes

- Social network and internet interaction services, which provide data about the individual's preference and relationships.
- Infrastructure-bound sensor data about the environment
- Mobile and wearable sensor data about the individual and moving objects

2. Framework SCI

SCI also monitors the real time change of the physical world for public good and track and predict specific events to benefit society. As an example, in Polytechnic have some activities, student need to instant answers to queries, such as when the activities, which it locate and how to get there. Information available by analyzing pervasive data streams collected from personal mobile phone sensors, internet applications such as online social networks like Facebook, GPS devices can make the SCI system get information. SCI related focused on at a time in fixed instrumented areas, by individuals rather than groups, and they mostly relied on specialized sensors using kinematic, location and object manipulation based cues and view data on interactive time scales, such as Navigos XI web which we can monitor our network like their performance in campus in everywhere.

SCI has the unique characteristics, which differentiate with another research field area as such social computing. Characteristics of an SCI can be embodied in the following aspects:

- (1) Infrastructure: concept of an infrastructure is to integrate heterogeneous devices and large scale, spaces and software which provide systematic support for deployment, evaluation and rapid application development. Characteristic of an SCI can be reaches the level of a community, real-life data collection and inference.
- (2) Data: the data sources are multi-modal and heterogeneous. Data of SCI are from three main data sources: the mobile /wearable sensor data, the infrastructurebound sensor data and the social data. Every source related about individual and moving objects, the environment and relationship with others from social networks and internet interaction services. The combination of the three data sources can reveal unforeseen social and community behavior.
- (3) Technology: in technologies the core for SCI are data mining, machine learning and artificial intelligence. The function of data processing and inference goes from recognizing the individual's physical activity and environmental context to extracting higher level community and social behaviors

(4) Application: to enable innovative services in society level like community healthcare

The structure of social network is made up of a set of actors (Daniel Fisher,2011). This can be explained as a theoretical construct useful in the social network to study the relationship between individual, group's organizations or even entire societies. Characteristics of SCI show that SCI has more opportunity in diverse research field as social computing, mobile computing and machine learning (Zhang et.al, 2011). In characteristic technology from individual physical activity and environment context can extract higher level communication and social behaviors (Zhang et.al, 2011). This mean, from SCI we want to study each of the sources which social model, community model and intelligence model can be considered as the sources to be a model for the SCI relationship of social network theory. The figure 1 is the general framework of SCI adaptation from (Zhang et.al, 2011)



Figure 1: A general SCI system framework

The main objective before extracting the complete SCI is to mine the frequent data patterns to derive the individual's behaviour and single space context. To accommodate feature aggregation, it is in the semantic inference layer uses logic based. This layer uses explicit rules and complements the statistical learning approach to effectively associate the hybrid learning layer with the expected SCI on the basis of expert domain knowledge. The last layer, application layer comprises a variety of potential SCI enabled services such as in social network services. The SCI layer which concludes the individual or group behaviour, social interactions and community dynamics were describe to reveal the digital traces that people leave while interacting with web applications, static infrastructure and mobile and wearable devices from the first layer. The social model, community model and intelligence

model are three models being to study related to SCI. The question is can the three models were becoming the model for SCI? Can SCI have a model or a self-organizing network? We believe it is extremely difficult to derive an exact ally model that combines all three characteristics of SCI. Based on the characteristics of SCI; it shows the SCI is a study that allows us to study the various aspects. In this study emphasizes the suitability model for SCI.

3. Methodology

As the general the technique simulation has been chosen as the technique for evaluation because it is the best and appropriate technique to obtain information and gather more details that can be incorporated for more accurate results. Time availability for evaluation and cost allocated for the thesis are also another reason why simulation is chosen. By using simulation, researchers should be able to simulate and study a system in well-known conditions with different scenarios. As for example, (K. Herrmann, 2006), he was using the RePast framework as agent based simulation, the simulation plane is organized as a grid of cells. A simulation that is based on our framework may extend the social user implementation to realize any application specific user interaction and internal application logic. The simulator chosen for this research is the network

simulator NS-2, version 2.34. NS is a discrete event simulator targeted at networking research which provides support for simulation of TCP, routing, and multicast protocols both wired and wireless networks. This is probably the most extended simulators in research and education.

From this section, the overall view of the research procedures is explained taken after the research problem has been identified. Figure 2 illustrates the flow of each research procedures phases in sequence.



Figures 2: Research Procedures

In this simulation, the study will investigate the effects of different social model, community model and intelligence model on SCI using AODV routing protocol as the route establishment choice. The simulations are running in a wireless environment.

In this study, the performance metrics discuss based on characteristics in a social network. In paper of (M. Musolesi and C. Masclo, 2006), they say movement are governed by different of mobility which depend on the people they need to interact. Refer to their model, they allow the association of different social networks for different periods of a simulation (M. Musolesi and C. Masclo, 2006). Hence, the performance metric tests in this research area:

- i. Contact time
- ii. End to end delay
- iii. Direction of movement
- iv. Autonomous gossips



Figures 3: Architecture of

According the figure 3, it shows the communication between three kinds of model with a NS-2 simulator to develop SCI model. In social mobility model the performance metric are contact time or direction of movement. This performance metric will evaluate in community mobility model and also in intelligence model. As the contrary, the social mobility model evaluates performance metric in community mobility model and intelligence model. The arrow on the figures 3 shows that every model interact each other means there simulates the performance metric together. From the result it can show whether the SCI have an own model or the SCI just Self organizing network.

4. Conclusion

The three models were being simulate there are Random Waypoint models for social model, a Nomadic Community model for community model and Minsky model for intelligence model. We use AODV for the evaluation and performance in wireless networks. The performance metrics to evaluate are contact time, end to end delay, direction movement and autonomous gossiping. We simulate an environment using 20 nodes moves about in an area of 500m x 500m. Each node in the simulation has rate transmission range 200m. The data traffic characteristic is based on constant bit rate and the simulations evaluate 50kb. In autonomous gossiping, the execute based on gossip protocol simple as mentioned earlier. A source sends the route request with probability 1. When a node first receives a route request with probability p it broadcasts the requests to its neighbors and with probability 1- p it discards the request, if the node receives the same route request again, it is discarded. Thus, a node broadcasts a given route request at most once. This simple protocol is called Gossip1 (Z.J Haas et. al, 2006).

In this research a study of behavior models has been realized through the NS-2 simulator, applying different scenarios and models. The SCI can generate the behavior by using the already model without to create the new model. We simulated three models, random waypoint, nomadic community and Minsky, using a variety of mobility scenarios designed to be more realistic. The parameters for being studied are contact time, end to end delay, direction of movement and autonomous gossiping behavior. Based on the methodology described, this research does the simulation NS-2 and used the parameter related to the behavior of human which as described earlier. The SCI still the new era research which has many field can we do in SCI. Our research is just done to appear the suitable model can create in SCI based on the parameters are being chosen. The intelligence model is hard to get the information because not many researches are doing in the intelligence field.

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