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Improvised Handover Elimination Scheme in Relays Based Crowd 4G Architecture

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Abstract - *With the prevalence of sensor-rich equipped smartphones in recent years, Mobile Crowd- Sensing (MCS) becomes a promising paradigm to facilitate urban sensing applications, such as environment monitoring and traffic congestion detection.For this we are going to reduce the overall participant of 4g data access and will increase the overall speed and throughput of the system.Usually the for accessing the 4g data plans there are number of users was high. This will produce the overall network resource availability into unavailabilty.We are applying the new technology called as crowd sensing, in which we are making the primary user as the relay section for distributing the data over secondary user which will reduce the overall delay of the system.Save the participants' smartphone energy consumption and mobile data cost via collaborative data uploading.*

Key Words: **Mobile Crowdsensing, Energy consumption, Mobile data cost, Data quality, Location privacy, Delay-tolerant data uploading.**

1. INTRODUCTION

Mobile Crowd Sensing (MCS) — a term coined by Ganti *et al* , has recently spurred lots of research interest. Similar to the notion of participatory sensing and human-centric computing,mobile crowd sensing refers to the sensing paradigm in which mobile users with sensing and computing devices are tasked to collect and contribute data in order to enable various applications. MCS applications leverage the sensing, computing and wireless communication capability offered by the millions of mobile devices. Nowadays mobile crowd sensing (MCS) is becoming an effective and practical way to carry out various sensing tasks, as rich-sensor equipped smartphones are getting more and more popular. However, some obstacles severely stop users from participating in MCS tasks. For example, participating in MCS tasks will incur additional 4G data usage for a user, which might lead to more fees paid to the telecom operators. This issue, which we will refer to as 4G data cost, is one of the major concerns for MCS participants To deal with this issue, some existing MCS projects task users to delay uploading sensed data until they have a WiFi connection; apparently this method might lead to long uncontrollable delay between data sensing and uploading. Such a long uncontrollable delay might harm many MCS tasks. On one hand, uncontrollable delay might not be tolerable for most real-time monitoring applications, as the delayed sensed data becomes valueless; even if an MCS task allows some delay, uncontrollable delay may still exceed the maximum tolerable delay. On the other hand,long uncontrollable delay increases the probability of sensed data loss due to abnormal events on participants' mobile phones (e.g.,running out of storage space). Another effective way to mitigate participants' 4G data cost concern is providing participants with incentives to cover any additional 4G data cost arising from participation in the MCS task. Compared to WiFi-only uploading, refunding 4G data cost encourages participants to willingly upload data at any specific time via 4G, which can reduce and control the delay between data sensing and uploading. However, 4G data refund increases an organizer's total MCS task budget. For MCS tasks which need a big number of participants, in particular, this 4G data refund budget can be significant. Thus, "how to reduce the 4G data refund budget" becomes a critical problem for MCS organizers.In this paper, we try to address the above problem. First, we study the common price plans of 4G data cost.

2. EXISTING SYSTEM

In existing system to overcome the delay produced by the too much participant in internet access they have applied the scheduling based schemes. In which two schemes are allowed in details internet will divide into two types of schemes like 2G,3G. So that user can decide which plan they can use . By this way overall user count for data access can be reduced.

2.1 DISADVANTAGES

The main disadvantage of the existing system was user cannot get the desired quality of service.The delay produced while accessing the internet was too high. The overall cost of the system also high when compare to the proposed system. The unlimited plans data user can not able to forward their data plans

3. PROPOSED SYSTEM

In our proposed system we are applying the crowd sensing algorithm in which user can divide into two clusters as unlimited plan user and pay per usage user. The problem was while large number of users accessing 4g Internet at the same time the maximum delay was too high.So that we are making the unlimited plan user as the relay station for the pay per usage users Which leads to reduction in the overall participants in the 4G data plans. Currently two price plans are widely used by most telecom operators:

1) Unlimited data plan (UnDP) and
2) Pay as you go (PAYG).

3.1 Unlimited Data Plan: With UnDP, a user can transfer an unlimited amount of data during a period of time (usually for a month). The cost for an UnDP is fixed, e.g., \$7/month (denoted as $Price_u$).

3.2 Pay As You Go: With PAYG, a user pays 4G data cost.according to the amount of data transferred via 4G, e.g.,\$0.1/MB (denoted as Price).

4. ADVANTAGES

The main advantages of proposed system were it improves the overall QOS of the 4G data services. It can minimize the delay produced by the slow speed connections. User can act as the relay station which leads to uninterrupted 4G service. The overall complexity faced by the 4G base station also minimized.

5. PROPOSED SYSTEM ARCHITECTURE

To solve the problem formulated in the previous section, we design a novel MCS data uploading framework named ecoSense. In this section, we first use a running example to illustrate the basic idea of ecoSense and compare it with direct-assignment. Then, we give the over compare it with direct-assignment. Then, we give the over view of our proposed ecoSense framework. With the above two 4G price plans, a simple solution to refunding participants' 4G data cost is to choose the right refund scheme for each mobile user according to the amount of her uploaded data.

The overview of our ecoSense framework is shown, which contains two key components.

5.1 Uploading Decision-Making (Client Component)

This component runs on every crowdsensing participant's smart-phone. It is triggered to decide whether to upload/relay or to keep data when a participant encounters a cost-free event, such as meeting another participant or discovering a Bluetooth/WiFi gateway. The uploading decision-making component will be further elaborated in Section V.

5.2 Participant Partition(ServerComponent)

This component runs on the crowdsensing organizer's server to assign the participants to either the UnDP or the PAYG group. It relies on two modules—mobility prediction and sensed data size estimation.

i. Mobility prediction module

It predicts participants' mobility patterns in the next month. With mobility prediction results, we can forecast how often a participant might meet another participant, a Bluetooth gateway, a WiFi AP, etc.

ii. Sensed data size estimation module

It estimates the amount of sensed data that a specific participant would contribute in the following month. For different participants, sensed data size might vary according to their activeness, privacy concerns, visited locations, etc.

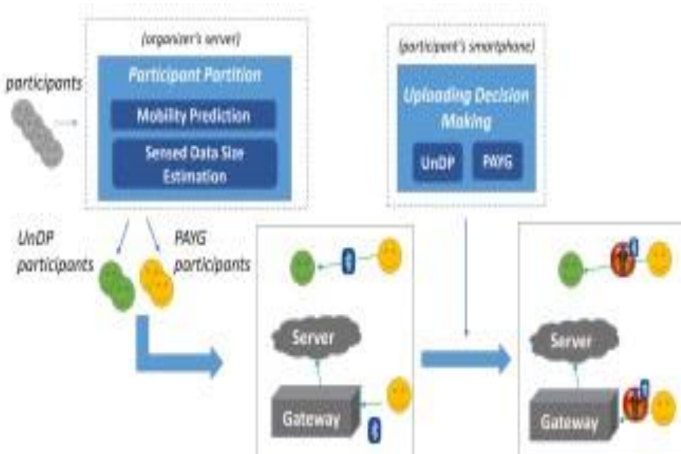

Fig- 1: Overview of the ecoSense framework

7. PROPOSED SYSTEM METHODOLOGY

7.1. UPLOADING DECISION-MAKING

To encourage users to participate in MCS tasks, it is paramount to minimize the inconvenience incurred for users. In this regard, energy consumption and mobile data cost are two critical concerns. While energy consumption is related to a mobile phone's battery life, mobile data cost is associated with the monetary fees, especially for the users who do not hold an unlimited data plan. Therefore, reducing energy consumption and data cost can encourage more people to actively participate in crowdsensing tasks. In this part of the dissertation, we design the collaborative data uploading framework to address the two concerns of crowdsensing participants. This can be proposed and implement the basic idea of collaborative data uploading, leading to a system called eff*Sense*. In effSense, via energy efficient and cost-effective communication methods, participant's help each other in the data uploading step so as to save energy consumption and data cost. Next we suppose that the organizer will pay participants monetary incentives to cover their mobile data cost during collaborative data uploading. Then, we design an incentive mechanism for participants, called *ecoSense*, which not only compensates participants' data cost concern, but also is economically efficient for the organizer.

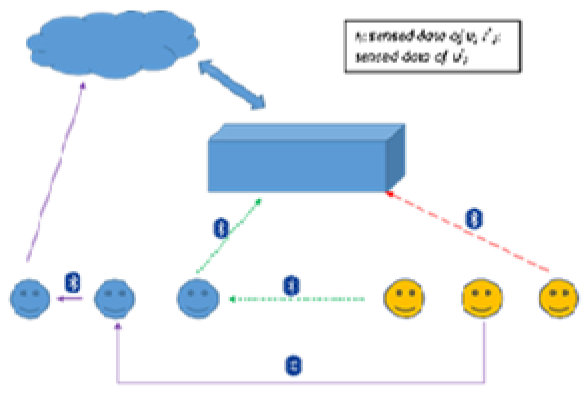

Fig-2: Example of effSense

EffSense is designed based on the following observations:

i. Non-data-plan users can eliminate mobile data cost in data uploading by using zero- cost networks such as Bluetooth and WiFi. For example, they can upload data to the server directly via WiFi, or transfer data to another device via Bluetooth if the other device can relay data to the server without incurring extra cost.

ii. Data-plan users can reduce energy consumption in data uploading via the energy- efficient methods other than establishing a new 4G connection. For example, piggybacking a data uploading task on a 4G voice call can save 75-90% energy consumption. Alternatively, uploading data via WiFi or Bluetooth consumes less energy than via normal 4G.

7.2 PARTICIPANT PARTITION

After choosing the uploading strategy for the participants, the crowdsensing organizer also needs to partition the participants into two groups—PAYG and UnDP—in order to minimize the 3G data cost that needs to be refunded. Fig. 4 shows the overview of the participant partition framework. To achieve a reasonable participant partition, two factors need to be considered.

i. ***Mobility Pattern:*** A participant's mobility pattern affects how often she could meet another participant or a Bluetooth/WiFi gateway.

ii. ***Sensed Data Size:*** Different participants will most likely contribute different sizes of sensed data due to variant behaviors such as their degree of activity and their privacy concerns. In this section, we first describe our methods to predict participants' mobility pattern and to estimate participants' sensed.

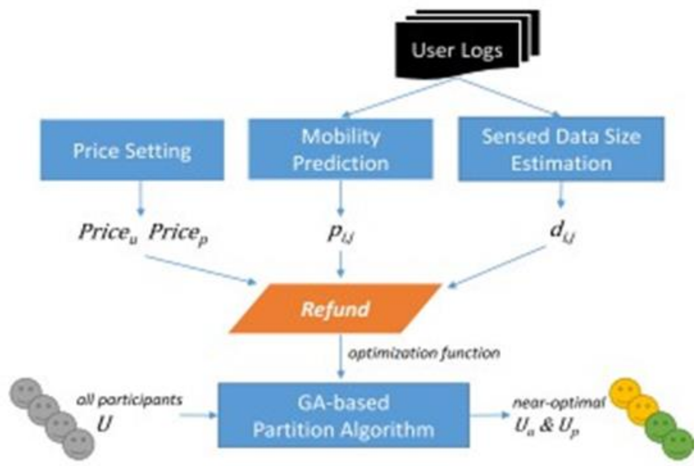

Fig -3: Overview of participant partition

8. CONCLUSION

Refunding MCS participants for additional 4G data cost incurred during the crowdsensing process is an effective marketing strategy for the MCS organizer. In this paper, we investigate the problem of how to minimize the total 4G data refund budget for the crowdsensing organizer who follows such a marketing strategy. Based on two widely used 4G price plans, i.e., PAYG and UnDP, we propose a delay-tolerant data uploading framework called ecoSense, whose goal is to minimize the organizer's 4G refund budget for all the participants. By introducing delay-tolerant data uploading mechanisms, UnDP participants could relay PAYG participants' sensed data to the server without additional 4G cost; PAYG participants could also upload their sensed data via free-charge Bluetooth/WiFi gateways to reduce 3G cost. Based on these observations, we propose the data uploading strategies for both PAYG and UnDP participants and design a participant partition algorithm to determine whether a participant should be assigned to PAYG or UnDP. Our ecoSense framework was evaluated using the MIT Reality Mining data set and a larger SWIM simulation data set. The evaluation results showed that ecoSense could save up to ~50% of the refund budget compared to direct-assignment that assigns each participant to UnDP or PAYG directly according to the size of her sensed data.

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