SCHEDULING FOR MOBILE USER NEWS FEEDS WITH DIVERSITY

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ABSTRACT

By the tremendous growth of wireless devices many telecommunication industries are providing different services to mobile users. Social media are played an important role to spread this services up to mobile users. This paper belongs to one of those services called news feed. In this paper, we are focusing on location aware news feed system facilitate to mobile users to share his/her geo-tagged location by their spatial and non-spatial references. For that we implemented Heuristics algorithm. Drawbacks of previous system was inspired us to bring this new feature and get result with individual diversity term. We are focusing to get more results in very short time and system minimized overhead for that we use efficient techniques. It consist of prediction of location, relevance measure score, news feed scheduler and sorting. Location prediction is used for predicting user's location based on existing path algorithm. The relevance score is practical by combine vector space model with spatial and non-spatial factors to settle on relevance of message to a user. While news feed scheduler works to generate the message for mobile user's current and future location and finally, sorting will sort all the messages with best quality of message for user.

Keyword: - *Android Mobile, Spatial Database, Mobile Computing, Online Scheduling.*

1. INTRODUCTION

Many social media provide feature of location but no one focuses on scheduling all messages and news feed [1]. We proposed D-Mobifeed which is a extend of Mobifeed system a location aware news feed system that enable to share a geo- tagged messages with their spatial and non-spatial references. Older systems were generating the result but with same category of messages; we are giving a term individual diversity, where user get a distinct messages of different category according to different activities and places. To obtain this goal, we are divided it into two major parts that are decision problem and optimization problem. In decision problem, we give the solution as news feed to the user; for optimization problem we used Heuristics algorithm. We tested here all three stages in the algorithm and checked whether user get a better results or not [2]. For example Alice a user get news feeds according to his movement in a 1.5 km area and messages most relevant to him. This is ever since a location-aware social networking system typically possesses a massive number of messages; there are many messages in a query user's neighborhood. attach with user mobility, a explanation dispute for the location aware news feed system is how to agenda efficiently that k most relevant messages for user and demonstrate it to the mobile user screen. The up to date research model of a location-aware news feed system is GeoFeed. After that, Mobifeed were used but both are not satisfied user expectations unfortunately. Here we designed a news feed scheduler with location prediction algorithm and relevance score of message where user receive different messages according to every new activity [3].

2. LITERATURE SURVEY

2.1 Existing Systems

2.1.1 Geofeed system LANF

This system was firstly; provide a new platform to the mobile user receiving a spatial (eg. Geo-tagged) and non-spatial (eg. Interest) messages. For that, this system were used three different approaches i.e. spatial pull, spatial push and shared push approach. While using all these approaches it executed the user query and gives him response

But the repetitive answers was not satisfied user longer. And this was very time consuming system. An experimental results of this system was based on synthetic and real data to show that, Geofeed system is overhead could be significantly lower [4]. GeoFeed accompaniments an existing social networks functionality of location-aware and news aggregators to make them. Formerly a user u logs on to her favorite social network site that is prepared with GeoFeed, u will treasure the set of messages that are added relevant to her current location, for example, a message around local news, a mention about a local store, or a status message pointing friends in a definite area. For a user u that has a set F_u of N friends (in a social network context). The message was send in tuple form consist of (MessageID, Content, Timestamp, Spatial) Sender Message ID, Content represent the message content, Timestamp is time of message creation and spatial is the spatial extent [3].

2.1.2 Mobifeed System LANF

To overcome drawback of Geofeed, this system was designed and it gives the results better than previous system but unfortunately that results came from the same category of messages. To find the solution in this system different input functions were used namely, location prediction, relevance measure and news feed scheduler. The location prediction was used to predict user future location, relevance was used to send the messages about their spatial and non-spatial locations and news feed scheduler function was used to news feed for his current and predict location with the best overall quality [3]. MobiFeed supplies geo-tagged user-engendered messages in a database. It intermingles with the location prediction and relevance measure utility to select an assortment of messages from the database for a mobile user as a news feed at a Particular location [2]. receiving this messages are also having different techniques that many times user get news feed according to his nearby location or his type of interest or his history logs or the static news. Its depending upon the user what kind of message he carry and share with his friends whenever user gets online to the social network he started to receive news feeds by many sources it may be his friends or subscriber agents [6].

3. SYSTEM MODELING

A location aware news feed schema designed for social network systems to scheduling news feeds for mobile users. Figure 1 depict an application picture a Mobifeed user, Alice, can generate a message and tag a spot (e.g., m1), a spatial area (e.g., m14 is related with a circular spatial area), or a venue (e.g., m6 and m7 are spatially coupled with restaurant R1) as its geo-location. Alice knows how to also concern a Location-alert news feed query to repossess the k most significant messages within her specified range distance D from her location. D-MobiFeed consists of three major functions: location prediction, relevance measure score, and news feed scheduler. Given a user location as u's u:location at the current time t0, u's requisite minimum message exhibit time td, u's precise range distance D, u's requested number of messages per news feed, and a look-ahead steps n, the location prediction function estimate n future locations for u at times t1 = t0 + td, t2 = t0 + 2 × td, . . . , and tn = t0 + n × td, the relevance measure job calculate the relevance score of Each nominee message with a geo-location intersect any u's query region (i.e., a rounded area centered at u:location or a predicted location with a radius D), and the news feed scheduler generates news feeds from the applicant messages for u's query regions at t0; t1; : : : ; tn with the best total relevance score.

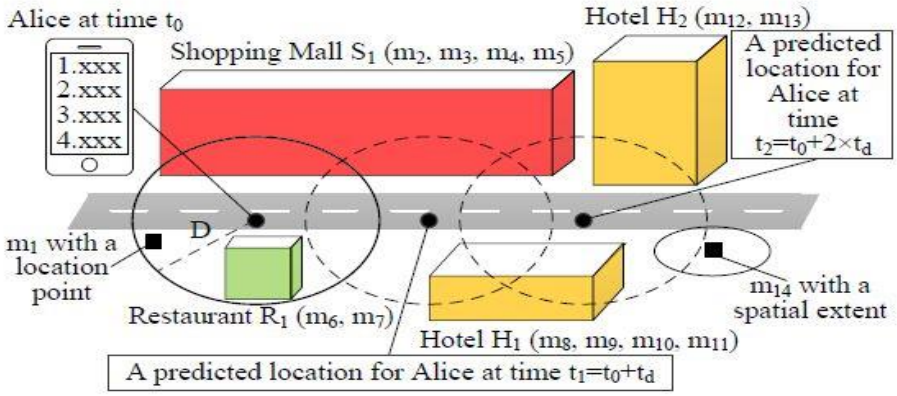


Fig -1: Location Aware News Feed Scheduling

D-Mobifeed define three major challenges namely candidate message step, scheduling step and decision step and these challenges were interact with systems key function i.e. location prediction, relevance measure, h-diversity constraint checker and news feed scheduler [3], [4].

3.1 Candidate Message Step

Given a user u's location at current time t0, u's definite minimum message display time td, u's required range distance D, u's requested number of messages per news feed k, u's specified minimum number of categories h, the location prediction function (which determine by path prediction algorithm for that we use u's current location , history log and road map on network)returns n future locations at times t1, t2, ...tn for u, where ti = t0+i×td. Then the news feed scheduler generates n+1 query regions rounded at each location (i.e., one reported location and n predicted locations). For every query region at ti, a range query is allotted to repossess a set of candidate messages CandidateMsgi with their spatial range Meeting the query region after that, the relevance measure function calculates a relevance score for every message in CandidateMsgi for u. In D-MobiFeed We combine spatial and non-spatial factors to implement the relevance measure function. This needed the relevance measure function to return a score to specify the relevance of a message mj to a user ui, i.e., relevanceScore(ui,mj). Some common keywords are reflects in the users history logs that reflects his or her area of interests. For example a user fire a query like, "I like spicy food" and he would happy to receive a messages about spicy food restaurants. Consequently, we use vector space model to measure relevance of message in terms of contents [2]. Let T denotes term set and M demotes message of set. mj is signified as a vector of weights of all terms in T, i.e., $mj.V = (hWj1, Wj2, \ldots Wj\ |T|$

3.2 Decision Step

After candidate message step, we have n+1 sets of candidate messages related with their category and relevance score to u. The h-diversity constraint checker goals to examine an entangled Problem of deciding whether we could generate n + 1 news feeds from the candidate message sets, below the limitation that messages in every news feed go to at least h categories. h-Diversity Constraint Checking (DCC) Delinquent: in that it seen a user u's news feed query and a look-ahead step n, D-MobiFeed decides whether for each of n + 1 news feeds, such that messages in each news feed belong to at least h categories. It could schedule at most k messages and if the result is positive i.e. Belongs to the different category D-MobiFeed proceeds to perform further step i.e. scheduling step. Otherwise it can return a value of n+1 news feeds. The minimum total diversity is (γ) if diversity is satisfied then, γ = h x (n+1) if not then, γ < h x (n+1) [3].

- DCC – Diversity Constraint Checking
- LANF –Location Aware News Feed
- RDCC – Reduced h-Diversity Constraint Checking
- DCS – Diversity Constraint Scheduling

3.3 Scheduling Step

The news feed scheduler lastly resolves the tangled problem by calculating n + 1 news feeds that Satisfy the minimum total diversity (γ) and have the maximum total relevance score. D-MobiFeed supports different weights for different positions in a news feed result list, i.e., a higher weight is given to a message displayed at a higher position because it would be easier to draw a user's attention. purposely, known a outcome list with k positions, the weight of the initial position is k, the weight of the second position is k − 1, and so on. In general, the weight of a message mj at the j-th position (1 ≤ j ≤ k) is display Weight (j, k) = k − (j − 1). Thus, the relevance score of a news feed f with k messages m1, m2…. mk is calculated as:

$$relevance\ Score\ (f) = \sum_{j=1}^{k} relevance\ Score(u, mj)\ \times display\ weight\ (j, k))$$

4. A THREE – STAGE HEURISTIC ALGORITHM

The term heuristic is used for find solutions among all possible one, but they do not guarantee that the best will be found, therefore they may be consider as approximately and not accurate, usually find a solution close to the best one and they find it fast and easily. It is used in alternatives in search algorithms [4]. In this segment, we solve the DCS Problem with a three-stage heuristic algorithm. For first two stages, we abandonment the aspect of display weight only pointing at selecting k × (n + 1) messages to maximize the unweight sum of their relevance scores. In the final stage, we rank the selected messages in every news feed according to their relevance score.

4.1 Stage One: Satisfying h-Diversity Constraint

In this stage, we want n + 1 news feeds to select messages for each news feed, there are at most h distinct categories associating with messages. After selecting such messages, we assurance that n + 1 news feeds satisfy the minimum total diversity. Since we disregard the display weight of positions in this stage, we focus on maximizing the sum of relevance scores of target messages. sets of candidate messages n+1 for u's query regions at t0, t1, t2, . . . , and tn, beside with their category and relevance score to u, D-MobiFeed selects messages for n + 1 news feeds, such that (O1) each news feed contains at most h messages with distinct categories, and (O2) the sum of relevance scores of these messages is maximized. This problem we converted into minimum cost flow problem. the displayed minimum cost flow problem is assign an integer flow value x(vi, vj) ∈ [0, c(vi, vj)] for each edge e(vi, vj) ∈ E such that for every node v ∈ V the flow protection stuff holds, and the following objective function is minimized,

$$G(x) = \sum_{e(Vi,Vj)\in E}^{\infty} w(Vi,Vj) \times x(Vi,Vj)$$

After solving the minimum cost flow problem, for any edge (cj ,mk) with x(cj ,mk) = 1 where cj is in (i+1)-th group of Nc, it means that D-MobiFeed assigns mk to the news feed for u's query region at ti. Therefore we have,

$$G(x) = \sum_{e(Vi,Vj)\in E}^{\infty} w(Vi,Vj) \times x(Vi,Vj)$$

$$= \sum_{x(cj,mk)=1} w(cj,mk)$$

$$= \sum_{x(cj,mk)=1} (1 - relevancescore(u,mk))$$

$$= \gamma - \sum_{0\le i\le n} unweightedRelevanceScore(fi)$$

Where, unweightedRelevanceScore (fi) is the sum of relevance scores for messages in a news feed fi, regardless of the display weight [2].

4.2 Stage Two: Scheduling Remaining Messages

In Stage One, we have satisfying the minimum total diversity (γ) by scheduled messages. Whenever some news may not filled & some messages remain us again reschedule that kind of messages as n+1 news feeds for getting schedule in the system. This work will done by the algorithm in application. Where user fire his another query for searching he will select the relevant message as per his choice [4].

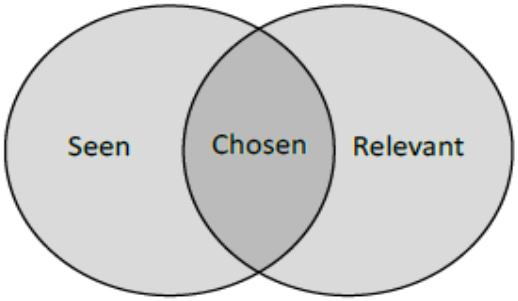


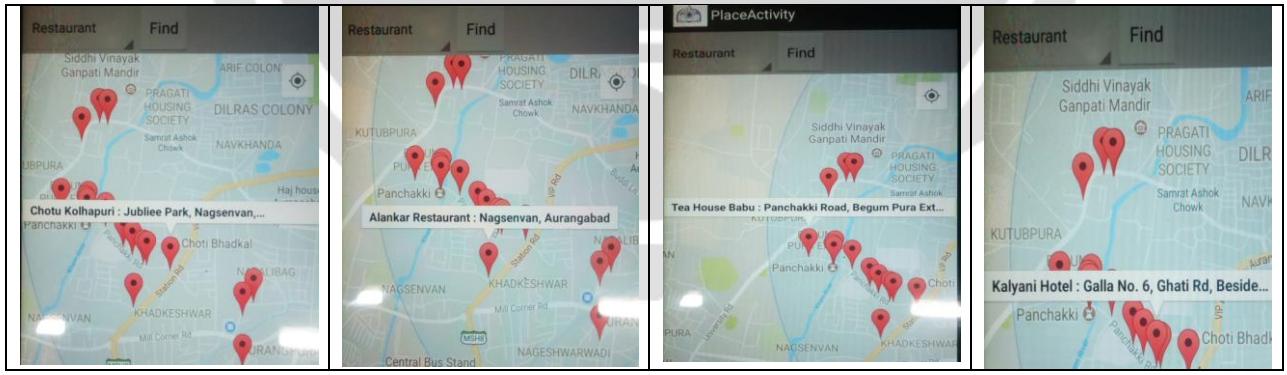
Fig -2: Searching, Choice and Relevance News Feeds

4.3 Stage Three: Sorting

After performing the first two stages, we have planned a set of messages for each news feed. In this phase we reflect the ceremony weight of different positions in the news feed. Spontaneously, we display a message with higher relevance score in a higher position (i.e., with a larger display weight). Therefore, for each of n + 1 news feeds, D-MobiFeed sorts the messages by their relevance scores in non-increasing order as its final result.

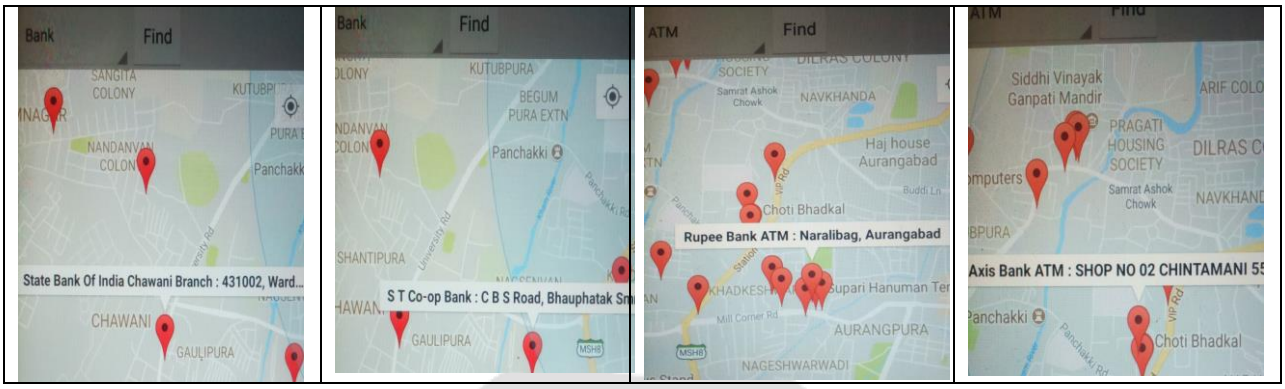
5. EXAMPLES & RESULTS

An examples and results here we give to assured number of messages (i.e. value of k) are prefer more diverse news feeds. Suppose, you are decided to go for picnic to visit a historical place Aurangabad city by car and you want to know some information surrounding you through your mobile at that time user will search some information about Aurangabad. So, he will get updates through mobile according to his moving position within his 1.5 km. That search will have any criteria like “food”,”Entertainment”,”Shopping”,”ATM’s”,”Hospitals”,”Movie Theaters”etc. he will get results by his moving positions. This is very helpful to users to know the things rounded by him. We give more than 10 options to get updates to the user. By getting this information this is very easy to travel anywhere comfortably for user.



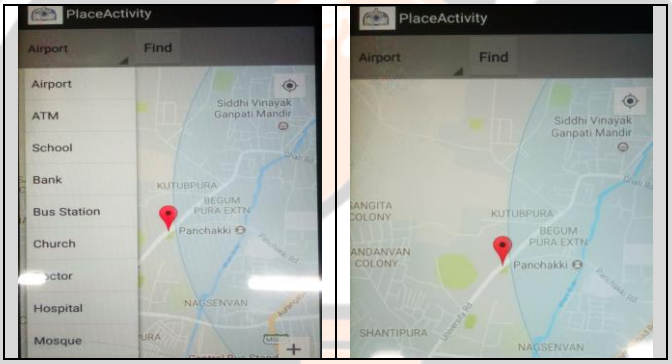
Snapshot 1: Showing news feeds for Restaurants relevant to user

When user is going for Aurangabad City and after traveled few hours he feel started hungry and search eatery for himself he will get results according his moving position within 1.5 every km. Suppose, user is visiting Panchakki area and now he want to eat something for himself he search for restaurants and get above results.



Snapshot 2: Showing news feeds for Bank & ATM relevant to user

Usually, in the travel many people avoid for carry to cash at that time he will search for the ATM's and Bank near to him for spending a money so, he will get above results.



Snapshot 3: Showing news feeds for Airport to user

Our all results will vary according to range of distance. Our results will always show a news feed within user 1.5 km. and it will vary by user moving position. In snapshot 3 user current position is area highlighted but user asked for Airport which is not comes within his nearby location so, it does not produce any result here.

6. CONCLUSION

In this paper, we designed D-MobiFeed; a location-aware news feed framework takes the relevance and diversity of news feeds moving users. DMobiFeed users can specify the minimum number of categories in a news feed as an h-diversity constraint, and it aims at maximizing the total relevance of generated news feeds and satisfying the h-diversity constraint. We centered on two input tribulations in D-MobiFeed, namely, decision problem and optimization problem. The decision problem is modeled as a maximum flow problem and enables D-MobiFeed to decide whether it can fulfill the h-diversity constraint for a news feed. For the optimization problem, we design an efficient three-stage heuristic algorithm to maximize the total relevance of news feeds under the h-diversity constraint. Experimental results based on a spatial database network, real road network, and crawled from just dial to specify records details to show that D-MobiFeed can efficiently provide location- and diversity-aware news feeds.

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