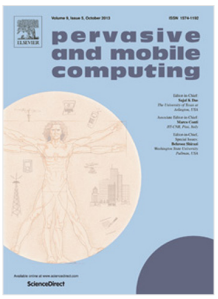
Accepted Manuscript



Regions-of-interest discovering and predicting in smartphone environments

Abdulrahman Al-Molegi, Antoni Martínez-Ballesté, Izzat Alsmadi

PII: S1574-1192(17)30363-2
DOI: https://doi.org/10.1016/j.pmcj.2018.05.001
Reference: PMCJ 932

To appear in: *Pervasive and Mobile Computing*

Received date : 11 July 2017
Revised date : 23 February 2018
Accepted date : 3 May 2018

Please cite this article as: A. Al-Molegi, A. Martínez-Ballesté, I. Alsmadi, Regions-of-interest discovering and predicting in smartphone environments, *Pervasive and Mobile Computing* (2018), https://doi.org/10.1016/j.pmcj.2018.05.001

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Regions-of-Interest Discovering and Predicting in Smartphone Environments

Abdulrahman Al-Molegi[a], Antoni Martínez-Ballesté[a], Izzat Alsmadi[b]

[a]*Smart Health Research Group, Dept. of Computer Engineering and Mathematics, Universitat Rovira i Virgili, Av. Països Catalans, 26, 43007 Tarragona, Spain*
[b]*Department of Computing and Cyber Security, University of Texas A&M, San Antonio, TX 78224, USA*

Abstract

Location-Based Services (LBSs) provide users especially in smartphones with information and services based on their location and interests. Predicting people's next location could help in improving the quality of such services and, in turn, boosting people's confidence on those services. Any successful LBS algorithm or model should target three major goals: Location prediction accuracy, high throughput or fast response and efficiency in terms of utilizing smartphone resources. This paper proposes a new approach to discover and predict people's next location based on their mobility patterns, while being computationally efficient. The approach starts by discovering Regions-of-Interest (RoIs) in people's historical trajectories (which denote the locations where users have been previously, frequently). A new model based on Markov Chain (MC) is proposed to overcome the drawback of classical MC. Our proposed model considers both space and time contexts where the space represents a specific location that has been visited by a user while the time represents the location visiting time. We show how classical MC model can be extended to include movement times and how time will improve prediction accuracy. One Unique finding in our research is related to the value of integrating users' mobility location/space with time context. In particular, time context is formulated in a way to add extra information to the space context. For better abstraction during building the model, a general transformation function is used to transform the n-order MC into first order. Results show that the proposed approach provides significant improvements in predicting people's next location compared with the state-of-the-art models when applied on two large real-life datasets, GeoLife and

Download English Version:

https://daneshyari.com/en/article/6888609

Download Persian Version:

https://daneshyari.com/article/6888609

Daneshyari.com