Creating Smart Information Services for Tourists by Means of Dynamic Open Data

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Abstract

This paper explores the creation of smart information services for tourists using dynamic open data. Research is described, which uses physical sensors at the Van Gogh Museum in Amsterdam to retrieve data about queueing time at that location. This data is added to an open data framework called CitySDK and combined with other open data in the framework.

Author Keywords

Sensors; Open Data; Information services; Tourism

ACM Classification Keywords

H.5.m [Information interfaces and presentation (HCI)]: Miscellaneous.

Introduction

Crowd-sensing is an important aspect of the internet of things. Digital footprints that are left via sources such as smartphone, social media and electronic transit data allow us to follow people and their activities [4, 2]. When using these types of data, it is usually difficult to overcome problems such as sparsity [1] or reliability [3] of the data . By using physical sensors in a specific location, there is more control over exactly what is measured, which allows to give reliable real-time information to the users.

Sensors are deployed at the popular Van Gogh Museum in Amsterdam to measure the current waiting time, which in combination with other data relevant for tourists, enables smarter information services. To be able to combine various data sources easily, the open data framework CitySDK[1] is used. This framework contains data such as, real-time transit information, points of interests and events.

CitySDK and pilot

CitySDK is a European project, which aims to create an open data standard and framework. Open data sources across Europe are combined into one simple framework. The data in the CitySDK consists of both static data about physical locations in the city, as well as real-time information from sensors in the city such as traffic density, transit delays and air quality. All the data contained in CitySDK is linked to an actual physical location within an urban environment (i.e. street or building). This makes it very easy to add new (sensor) data and link it to already existing data.

Building on the CitySDK framework, new data will be generated with sonic proximity sensors in the city of Amsterdam. In collaboration with the Van Gogh Museum, a pilot study will be performed with these sensors to monitor the queue in front of the museum. Using these sensors an application for dynamic route planning for tourists has been created based on CitySDK that should give tourists a better experience with less waiting time when visiting the city. The applied sensors are wireless sonic proximity sensors that are placed at regular intervals along the waiting line. The sensors have been developed in such a way that they are cheap and easy to implement at new locations. In the pilot phase, we will investigate if

tourists can be persuaded to change their route through the city based on real-time input from sensor systems.

Future work

Future research will aim on expanding the sensor network in Amsterdam, add existing datasets to the CitySDK and on new or improved information services. Creating a sensor network within cities that are combined in one easily accessible API allows for great opportunities for cities, researchers, service providers as well as users.

Acknowledgements

References

[1] Cheng, Z., Caverlee, J., and Lee, K. You are where you tweet: a content-based approach to geo-locating twitter users. In *Proceedings of the 19th ACM international conference on Information and knowledge management*, ACM (2010), 759–768.

[2] Ganti, R. K., Ye, F., and Lei, H. Mobile crowdsensing: Current state and future challenges. *Communications Magazine, IEEE 49*, 11 (2011), 32–39.

[3] Havlik, D., Schade, S., Sabeur, Z. A., Mazzetti, P., Watson, K., Berre, A. J., and Mon, J. L. From sensor to observation web with environmental enablers in the future internet. *Sensors 11*, 4 (2011), 3874–3907.

[4] Smith, C., Quercia, D., and Capra, L. Finger on the pulse: identifying deprivation using transit flow analysis. In *Proceedings of the 2013 conference on Computer supported cooperative work*, ACM (2013), 683–692.

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[1]http://www.citysdk.eu