

ParkJam: Crowdsourcing Parking Availability Information with Linked Data (Poster)*

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This poster shows a mobile Android app that uses openly available geographic data and crowdsources parking availability information, in order to let its users conveniently find parking when coming to work or driving into town. The application builds on Linked Data, and publishes the crowdsourced parking availability data openly as well. Further, it integrates additional related data sources, such as events and services, to provide rich value-adding features that will act as an incentive for users to adopt the app.

Motivation

Managing parking in congested areas is a well-recognized problem. In the modern car-oriented world, many will experience difficulties finding parking places when driving to work or into a congested city. In [1], Shoup discusses the effects of free parking, and suggests that parking spaces should be dynamically priced at a level that would result in about 85% utilization, with many benefits beside the improved availability. He acknowledges, however, that there is strong resistance to charging for previously free parking.

Another approach to managing parking is improving the efficiency of the use of existing spaces, by informing drivers about available spaces, and by guiding them to alternate car parks, for example through electronic systems and display boards. Still, only a minority of car parks are monitored by electronic systems.

This poster presents an app that leverages the growing popularity and affordability of internet-enabled smartphones, and the wealth of data available online, to crowdsource parking availability information from drivers.

Application Description

As shown in the screenshot on the next page, the app is built around a map view that shows car parks located in the zoomed-in area, which by default follows the user's location. The app can show the availability status of the car parks, and notify the user if the availability of a watched car park changes. Users can submit car park availability information; all submissions are aggregated to provide an up-to-date availability estimate for each car park.

In a separate view, the app will show any available detailed information about the car park, such as its opening hours and pricing. This information is initially

* The name of the app, "PARKJAM", may change when the app is released publicly, which is expected to happen well before the conference. More information can be found at <http://parking.kmi.open.ac.uk/>

taken from the LinkedGeoData project.¹ Where information about car parks is missing, PARKJAM users will be able to add it, and the system will feed it back to LinkedGeoData. In effect, the app crowdsources the creation and maintenance of parking location and availability data. The aggregate results are published as linked open data, to enable other third-party mashups and applications.

Further, PARKJAM integrates additional related data sources, as incentives for users to adopt the app. For example, the car park detail view can show nearby events (which may affect parking situation in the area), and dynamically discovered services associated with the car park, such as advance booking, that can be invoked directly from the app.

The research focus of the PARKJAM project is mainly 1) on crowdsourcing near-real-time data, and 2) on publishing such near-real-time data as Linked Open Data. For crowdsourcing, we especially investigate how semantic data formats and the parking use case bear on the challenges listed in [2]: *How to recruit and retain users? What contributions can users make? How to combine user contributions to solve the target problem? How to evaluate users and their contributions?* Finally, publishing near-real-time semantic data is closely related to work on semantic sensors [3], and we look into how the app, or its users, can be seen as sensors.

There are many mobile apps that help with parking. At best, they show the up-to-date availability of a limited number of car parks; for instance SFPARK² tracks selected on-street parking and parking garages in San Francisco. In contrast, PARKJAM focuses on crowdsourcing of parking availability data from its users, which can be applied globally, at the cost of a somewhat lower data quality.

This poster will complement the demo of the same app, if accepted.

Acknowledgements

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References

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2. Doan, A., Ramakrishnan, R., Halevy, A.Y.: Crowdsourcing systems on the world-wide web. *Commun. ACM* **54** (2011) 86–96
3. Sheth, A., Henson, C., Sahoo, S.: Semantic sensor web. *Internet Computing, IEEE* **12**(4) (2008) 78–83

¹ <http://linkedgedata.org/>

² <http://sfpark.org/>

