Exploiting Linked Open Data for Mobile Augmented Reality

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It’s all about me..

www.deri.ie

linkeddata.deri.ie/

Marc.deri.ie
Application areas

- Social sensing
- eHealth
- Augmented Reality
- Persuasive Computing

Mobility

- Context Management
- Presence
- Connectivity
- SensorHub
- PIM

Knowledge

- Location
- QoS
- Querying

Mobile Middleware

- Windows mobile
- Passive - ActiveRFID
- Android
- Symbian
- Motes
- iPhone

Platforms
Augmented Reality?

Mobile Device

Location-based

Content is POI’s
Anthony tells his mobile device: "I'm hungry and only got 20 bucks - find me something to eat, not far away". The mobile device, equipped with an advanced AR browser, shows three matches in a 500m radius, overlaid on the image the device's camera captures. The browser prioritises a local Indian restaurant above others by building a profile of Anthony's favourite cuisines after previous searches. However, Anthony feels adventurous and decides against the restaurant. He asks the AR browser: "anything around my friends would recommend?". The device pulls in restaurant reviews from Anthony's contacts and comes up with a new proposal: a nice Vietnamese restaurant, some 5min away. Anthony walks down the road, holding the device towards the restaurant. He remembers that recently there were some hygiene issues reported regarding some restaurants downtown. Just to make sure, he asks his device: "anything to worry about here?". The AR browser queries Public Sector Information provided by the town and the state and reports back to Anthony. The device shows two restaurants in the same street that had been shut down last week due to health inspections, but not the Vietnamese restaurant Anthony fancied. Now, Anthony is happy and relieved and has a decent meal there.
Our observations..

• Selection and Integration of data sources is done statically and does not scale
• Contextual information is under-utilised
• Browsing experience does not support discovery and exploration of new data
Linked Open Data Principles

• Use URIs as names for things
• Use HTTP URIs
• When someone looks up a URI, provide useful information, using Web of Data standards (RDF, SPARQL)
• Include links to other URIs
• 20 Billion data items
  – BBC, NY Times, Newsweek, US and UK government
• of which a lot is already geo-located data items, such as found in GeoNames, LinkedGeoData and DBPedia
Linked Open Data
Can LOD address some of our observations on AR as it currently stands?

• Linked Data supports dynamic selection and integration of data
  – Supports large scale because of URI’s for global identifiers
  – HTTP for agnostic and reliable access protocol
  – RDF for a uniform, graph-based data model

• Contextual data
  – Location is not the only entry point into the LOD cloud, it can be anything, so context could be something here

• Browsing experience with Linked Data can be “webbish”
Discussion Points

• End user perspective
  – Information overload
  – Therefore we need filtering and reasoning over the data

• Developer perspective
  – RDF and SPARQL are stable powerful technologies for integration and structured queries of LOD data
  – Need supportive activities such as identifying/creating a subset specifically for mobile/AR, and creating mappings between these technologies and current best practices such as JSON

• Cross-cutting concern
  – If we open up LOD to AR, there are issues regarding data provenance and trust.
  – Which data sources can and should be used and trusted.
  – W3C Provenance Incubator Group
W3C activities

• DERI is active already in the areas of LOD, SPARQL, and Provenance Incubator Groups amongst others