Detect, track and locate smartphones

October 2013
What does BlueMark do?

- Detect, track and locate smartphones by sensing the unique wireless signatures of Wi-Fi signals that a smartphone transmits.

- This information is used for:
  - Business intelligence in retail
  - Crowd control/management
  - ...

- Provide end-user solutions
Who is BlueMark?

- Founded in 2009
- Spin-off University of Twente
- Management team
  - Frank Groot Rouwen MSc - Business
  - Roel Schiphorst PhD - Technology
- External advisory board
  - Hans van der Hoek MSc
  - Alain le Loux MSc MBA
- Privately owned

UNIVERSITY OF TWENTE.

Finalist 2010
Finalist 2012
Technology
How does it work?

Wi-Fi signals (MAC address)
BlueMark architecture

Internet

Data processing unit

Database server

Web server

Cloud

mobile internet

internet
Privacy – 1

- Your smartphone sends out a signal (= MAC address)
- This signal is unique to your device
- The MAC address doesn’t contain any personal information:
  - No names
  - No phone numbers
  - Or any other communication ‘item’
Privacy – 2

➢ To be extra safe and secure:

➢ MAC addresses are hashed directly in the sensor (1-way encryption and unique per project)

➢ Limited data collection (user data is not recorded)
Localization

Trilateration - based on the received power
Intelligent signal processing to fit raw data to a model
Calculate new location based on previous position
Detection performance

- Part of the customers can be detected
  - Smartphone AND WiFi function switched on
  - **Fixed** ratio between WiFi devices and customers: ~ 50%

- Two trials in the Netherlands
  - Benchmarking with accurate Experian/Footfall system
  - Long period > 4 weeks
  - Results match for > 95%

- Our sensors count people with an accuracy of 95% or higher.
Business Intelligence in retail
Why?

- Measure consumer behavior to optimize shopping experience (both in shop and street)

- Similar to Google Analytics for websites

- More advanced than traditional counting systems
What percentage of shoppers in the shopping-area visit your store?

- Is the store window attractive enough?
- Is the store still located in the right place?
Understand who comes into your store

Unique visitor
New visitor
Frequent visitor

Visitors

35% 50% 70% 51%
You don’t know what you haven’t sold

- What do you know of the visitor between the entrance and the cash register area?
In non-food more than 60% of the visitors leave the store without buying but...

70% decide in the store to buy
What are the hot and cold zones in your store?

- Means a hot zone always better results?
- How many visit a department and don’t buy?
- Which departments are not attractive enough?
- To create a better flow around the store
Dashboard for our clients

Key performance indicators (KPI’s)

1. Number of visitors (per hour, day, week)
2. Number of **unique** visitors (per hour, day, week)
3. Visit duration
4. Visit frequency
5. Routing
# visitors per day

![Graph showing the number of visitors per day from 02/01/2013 to 21/01/2013. The graph includes multiple lines representing different days of the week.]
Busiest hours
Crowd control/management
Why?

- Avoid dangerous situations i.e. too many people during an event or festival.

- Atmosphere can **rapidly** change to **violent** if the number of visitors reach the capacity of the area.

- Guide visitors to prevent this situation. E.g. direct them to an overflow area.

- Also analytics similar to retail performance.
Serious Request 2012
Closing entrance to Event site
Number of visitors

In total 480 000 visitors
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