

Evaluation of the Smart Space Approach in Mobile Data Processing

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This demo is supported by grant KA179 of Karelia ENPI programme, which is co-funded by the European Union, the Russian Federation and the Republic of Finland.

11th FRUCT conference
April 23–27, Saint-Petersburg, Russia



Lausanne Data Collection Campaign by Nokia Research Center Lausanne

- Nearly 200 individuals
- Duration of 17 months
- Continuously collected spatial data
- Social interaction data
- Phone use data



Mobile Data Challenge by Nokia Research Center

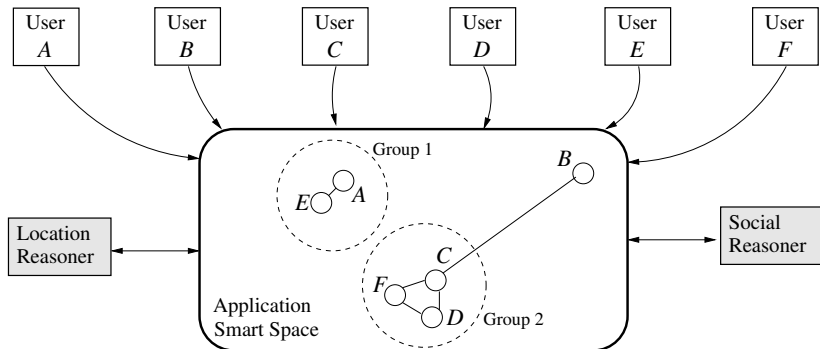
- Releases the Lausanne data (MDC Data Set) for the research community
- Two alternative tracks: Open Track and Dedicated Track
- Almost 500 challenge tasks were registered



Characteristics of the MDC Data Set provided for our research

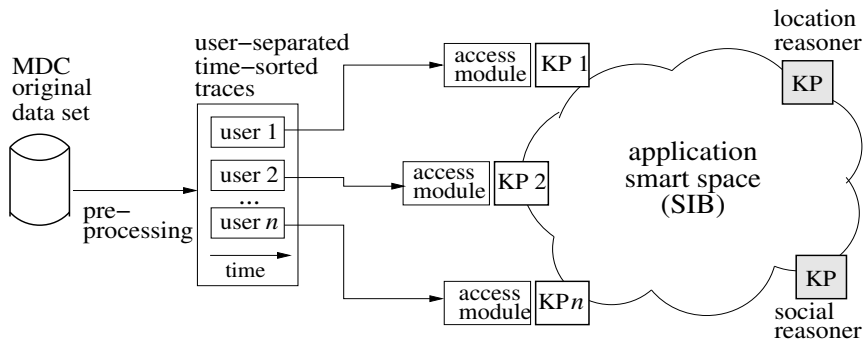
- Data on 38 individuals
- Data size 17.7 GB
- 13 types of data (accel, gps et al.)

Scenario: “Who is near?”



- Mobile users A, . . . , F share sensed data
- Reasoners derive operational knowledge

Architecture



- User KP i simulates user i by reading own trace produced from the MDC data set for n users
- Reasoner KPs operates as in the real scenario

User KP: imitation of specific mobile user

```
User's location has changed in SS
-----
Time: Thu Oct  8 18:56:41 2009
Current user's position:
lat: 46.51
long: 6.56
alt: 473.5
-----
User's location has changed in SS
-----
Time: Thu Oct  8 18:56:51 2009
Current user's position:
lat: 46.51
long: 6.56
alt: 438.0
-----
```

Current time

Current
coordinates

Location Reasoner: analysis of user locations

Getting coordinates of my user...

Getting coordinates of other users...

Analysis of coordinates...

Sleeping...

Getting coordinates of my user...

Getting coordinates of other users...

Analysis of coordinates...

Sleeping...

Getting location
data of users

Analysis of
coordinates list

Definition of close
users

Location Reasoner: definition of closest users

```
-----  
Getting coordinates of my user...
```

```
Getting coordinates of other users...
```


```
-----  
Analysis of coordinates...
```

```
005 is close to my user
```

```
002 is close to my user
```

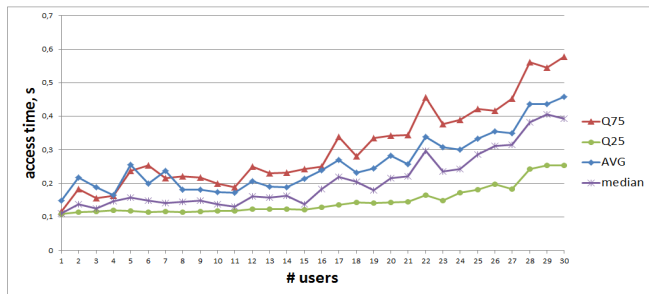
```
Sleeping...
```

Users who
are close

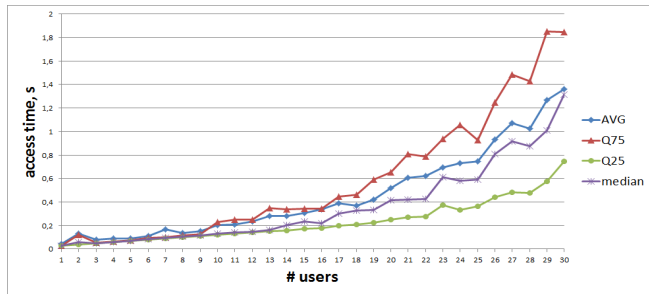


Radius of restricts the area, in which users are close

Performance evaluation



Access time of
User KP



Access time of
reasoner KP