



SmartTrace

An Indoor Trajectory Comparison Framework for Android Smartphones

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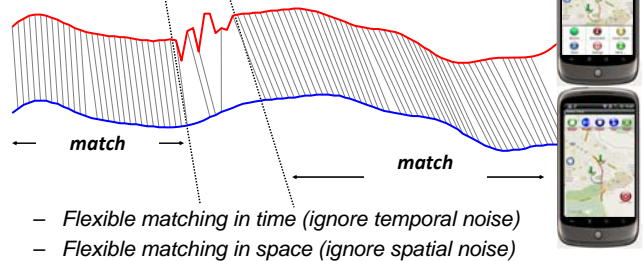
Goals and Contributions

Problem: Find the K users moving more similarly to a query trajectory Q, in a Smartphone Network.

- **Privacy:** User trajectories and User identities are **not disclosed** to the Query Processor.
- **Performance:** a) **In-situ data storage** of trajectories (on smartphone flash) and b) **Query Processing** using a **Top-K Query Processing Algorithm** that uses Bound Scores*
- **Ubiquity:** Our system works both **outdoors (using GPS)** and **indoors (using WLAN Signal Strength)**

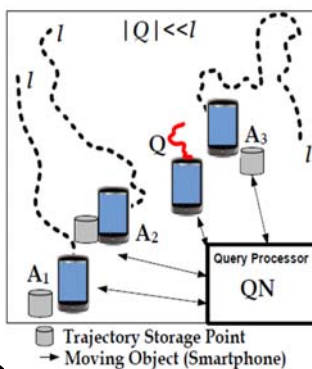
Similarity Comparison

ignore majority of noise

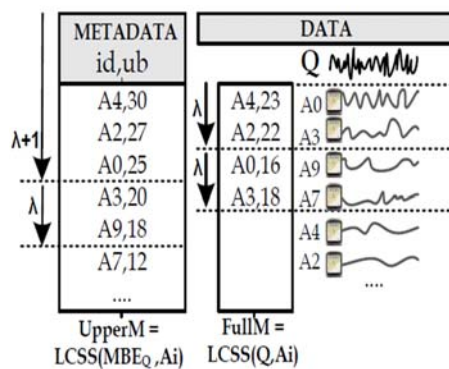


The SmartTrace Framework

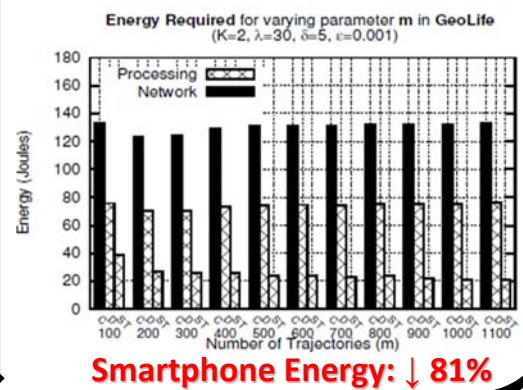
System Model



High Level Idea



Performance Evaluation

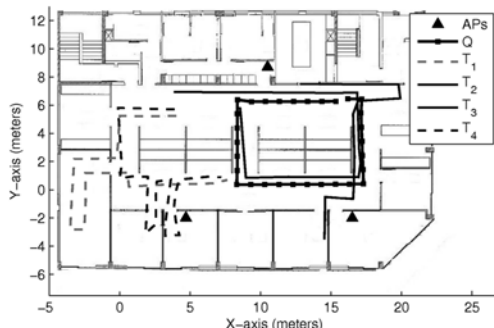


Android-based Smartphone Implementation

SmartTrace Outdoors (GPS)



SmartTrace Indoors (WLAN RSS)



Indoor Scenario at KIOS Research Center

- 560m² area, 3 APs
- 1 Query (Q) RSS trajectory
- 4 other (T1-T4) RSS trajectories
- Top-2 similarity search
- T2 and T3 correctly identified as top-2 answers

* "Disclosure-free GPS Trace Search in Smartphone Networks", D. Zeinalipour-Yazti, C. Laoudias, M. I. Andreou, D. Gunopulos, 12th Intl. Conf. on Mobile Data Management, IEEE CS, 6-9 June, 2011, Lulea, Sweden