

New Interaction Paradigms

using Mobile Location-Based Services



AR Navigation

INSTAR – Information and Navigation Systems Through AR



AR Navigation

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AR Navigation

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AR Navigation

INSTAR – Information and Navigation Systems Through AR

Method and Device for Displaying Driving Instructions, especially in Car Navigation Systems

EU, Patent EP 1 415 128 B1

USA, Patent US 7,039,521 B2

GER, Patent DE 102 36 221 C 1

Method and Device for Displaying Navigational Information for a Vehicle

USA, Patent US 7,216,035 B2

AR Navigation

The Solution



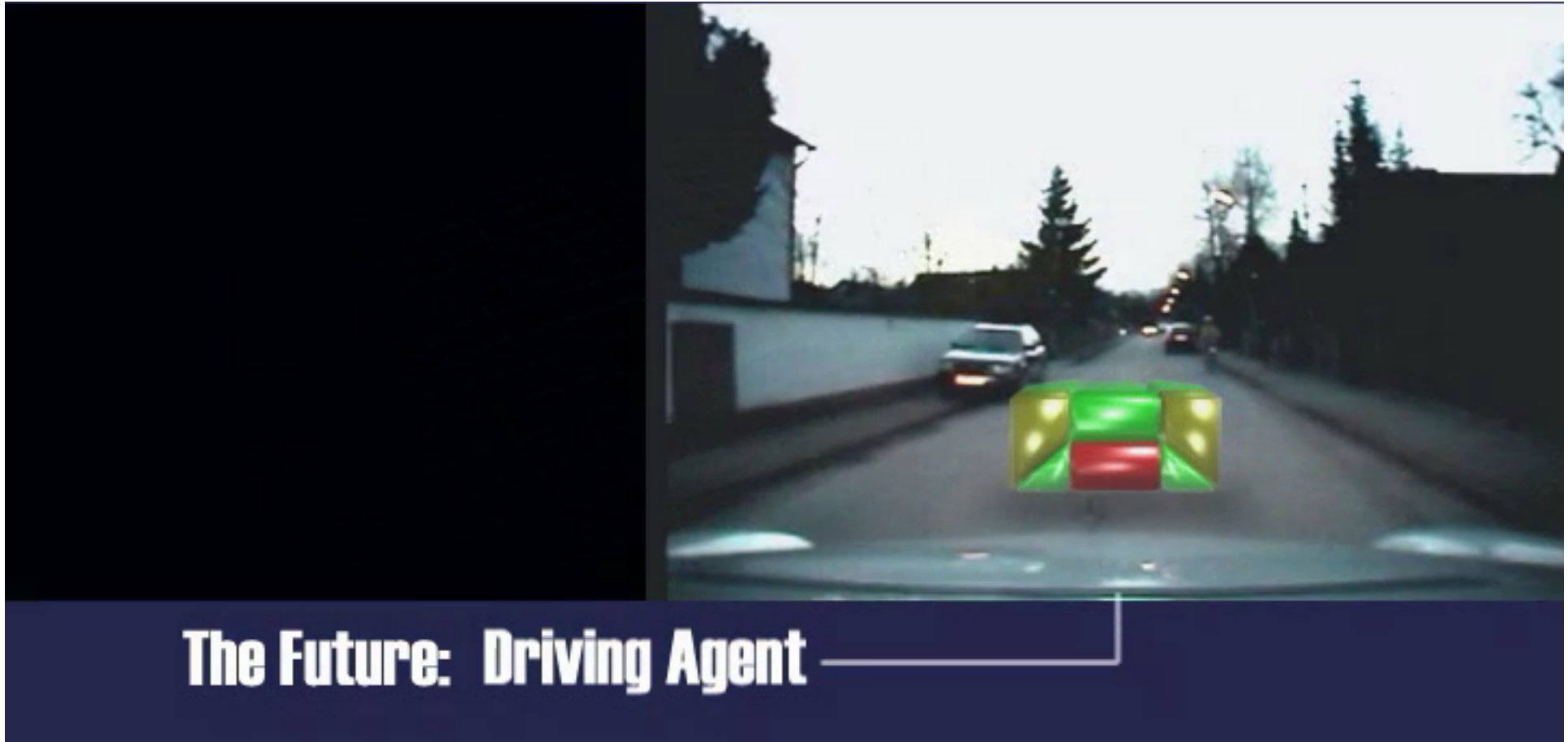
AR Navigation

Impressions



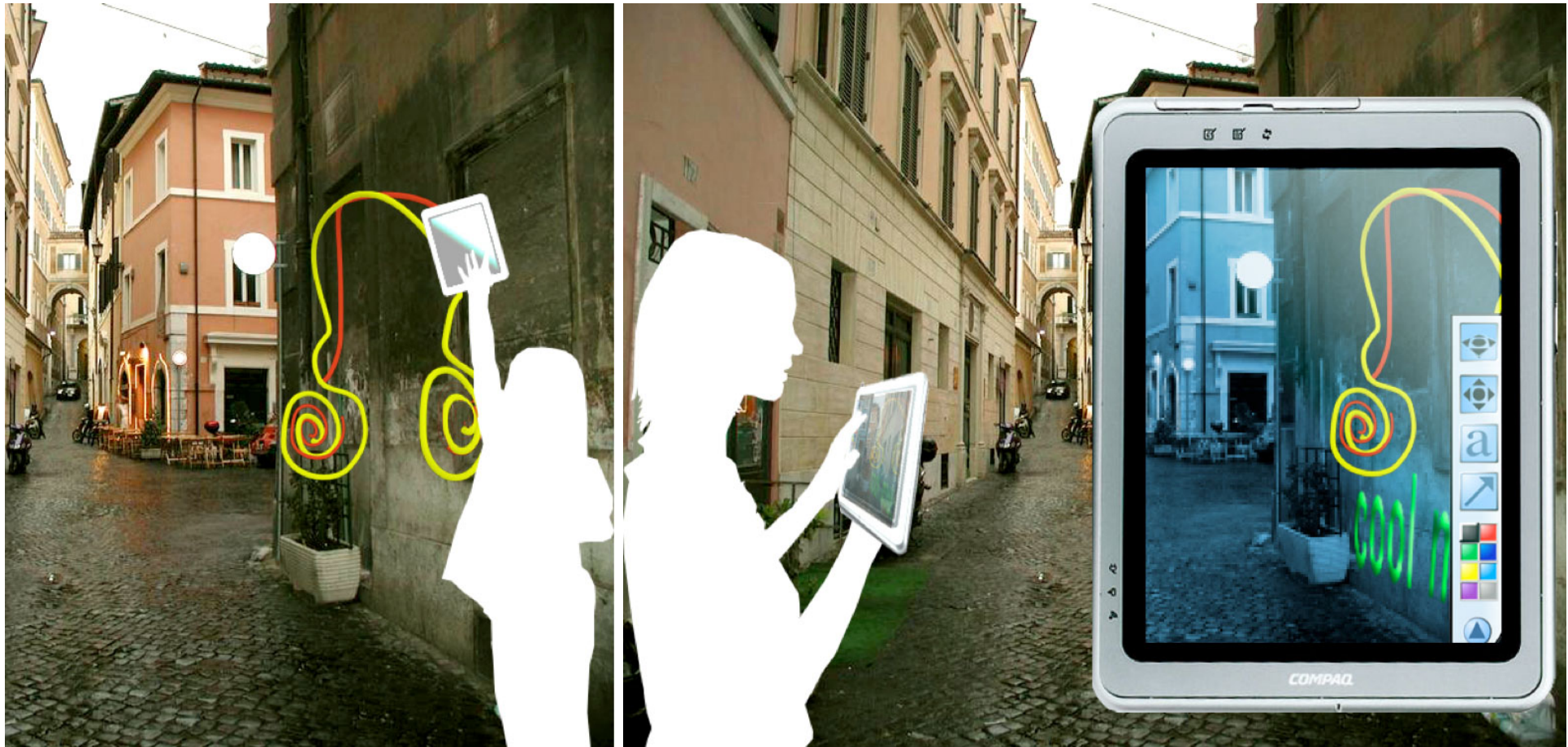
AR Navigation

The Future



Initial Paradigm

Draw Gestures and Read with See-Through Displays



Geo Gate

Location-Triggered Interaction Paradigm



Geo Display

Location-Triggered Interaction Paradigm



Geo Advertising

Location-Triggered Interaction Paradigm



Hawaii

Inklusive Flug und Unterkunft
im Luxus Hotel.

für Sie ab € 899,00

ruefa 

Wo Träume Urlaub werden.

Geo Advertising

Location-Triggered Interaction Paradigm



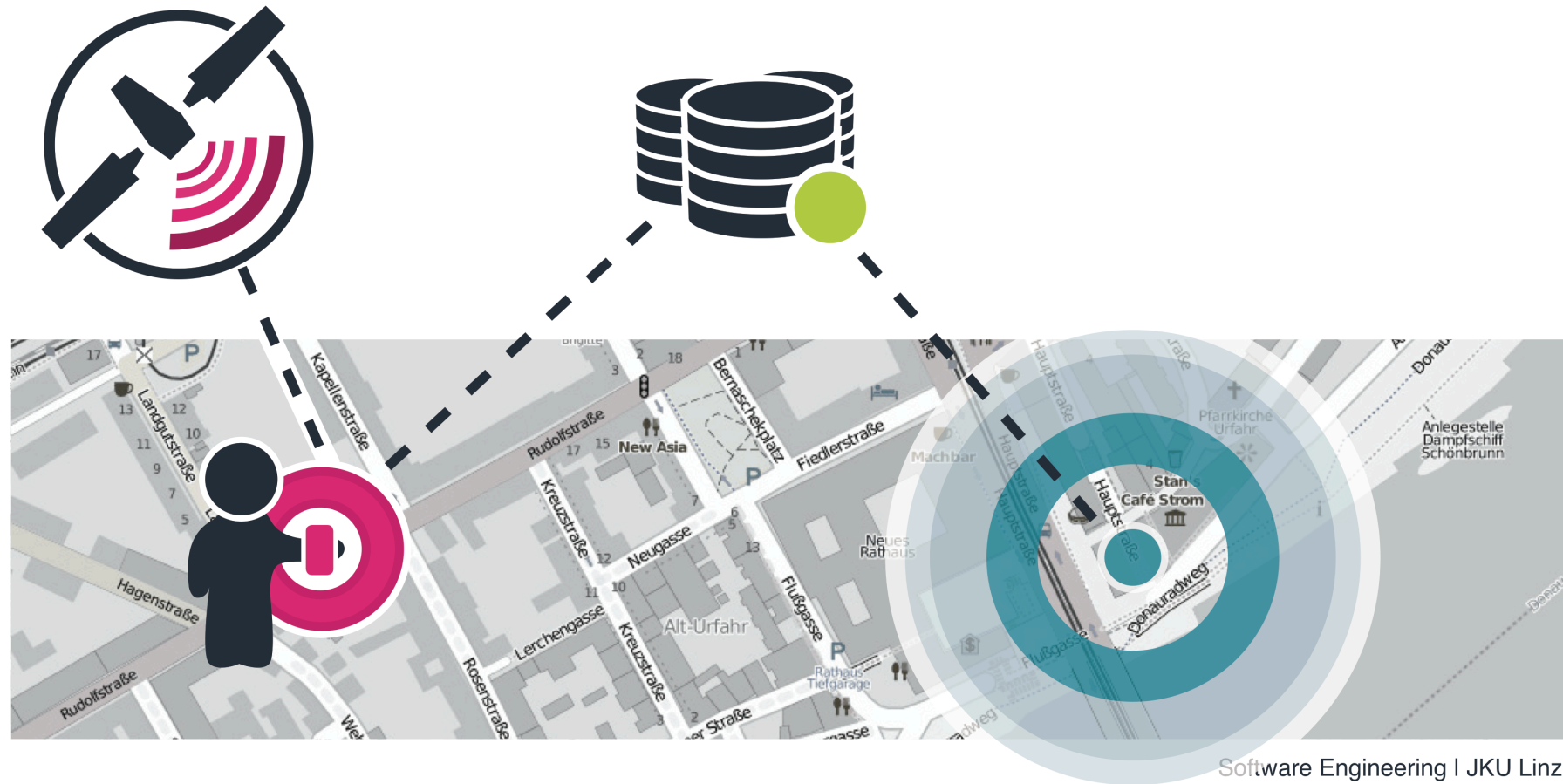
Geo Message (SMS)

Location-Triggered Interaction Paradigm



Technology

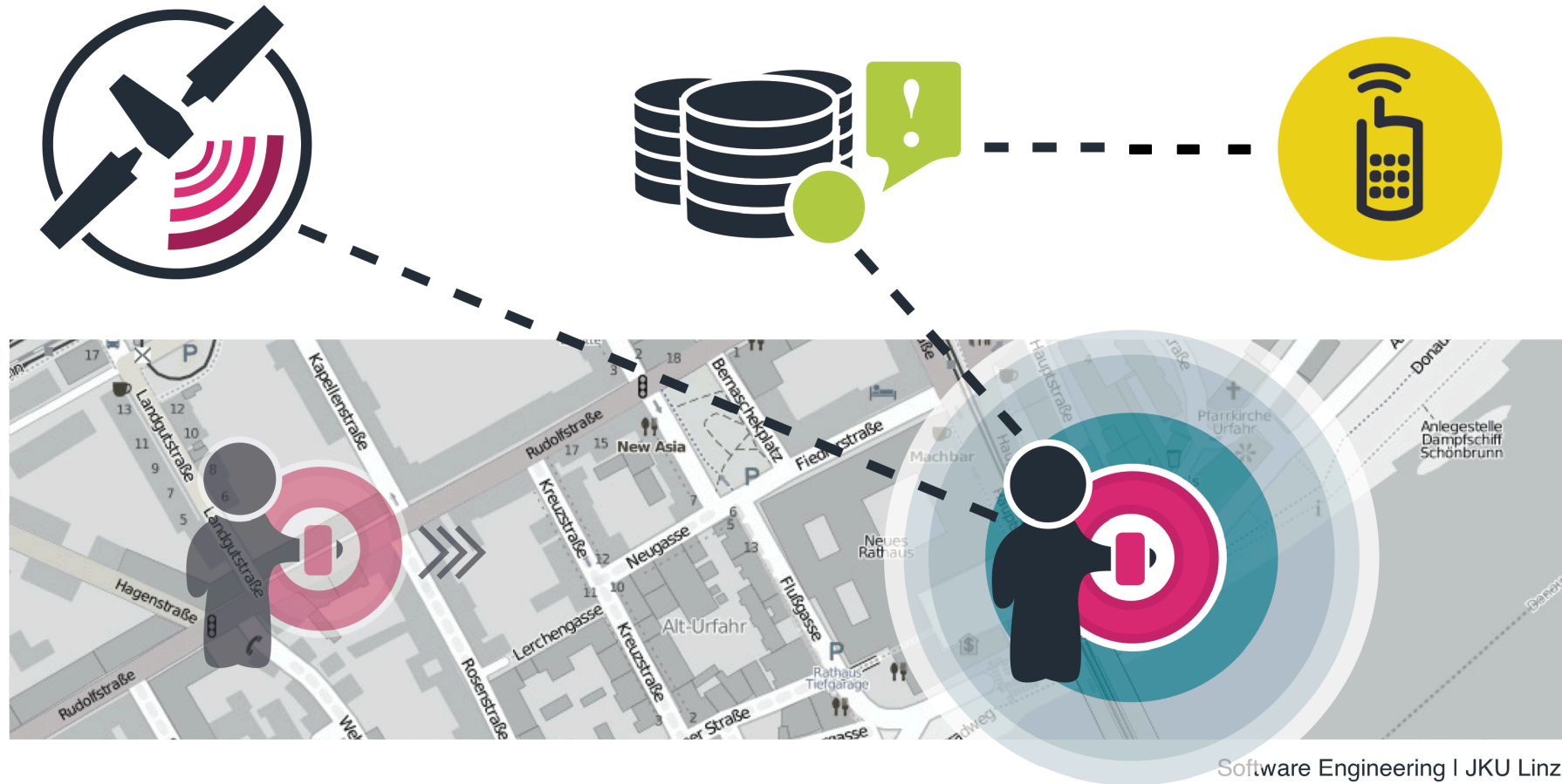
Location-Triggered Interaction Paradigm



Software Engineering I JKU Linz

Technology

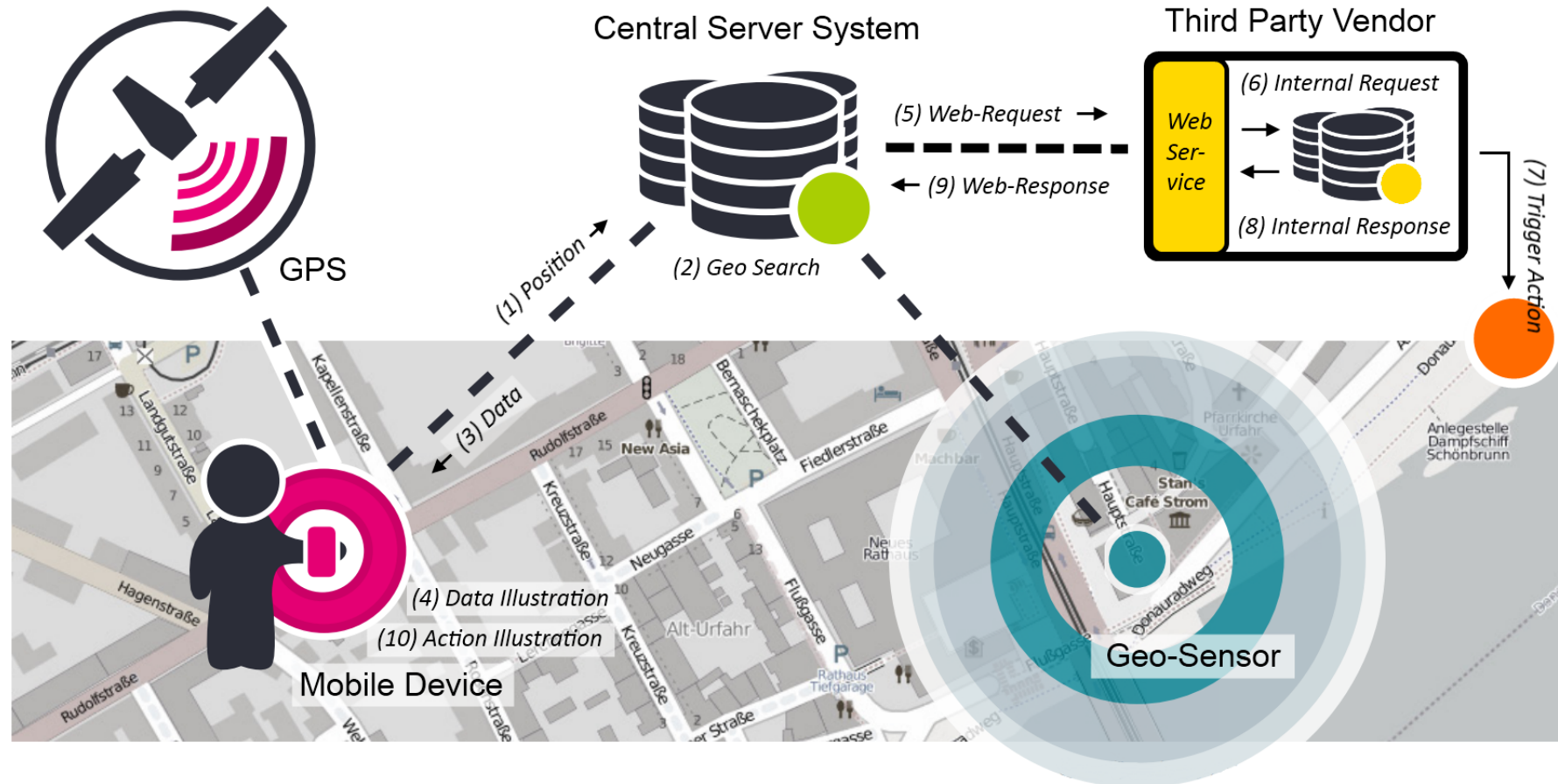
Location-Triggered Interaction Paradigm



Software Engineering I JKU Linz

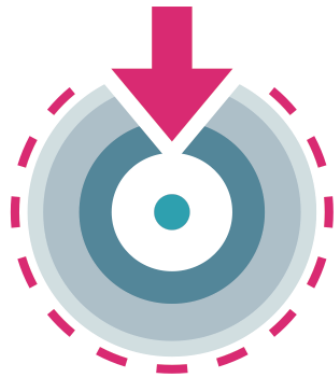
Technology

Location-Triggered Code Execution



Sensor Types

For Location-Triggered Code Execution



ENTRY SENSOR



EXIT SENSOR



SINGLE TRANSIT
SENSOR



DOUBLE TRANSIT
SENSOR

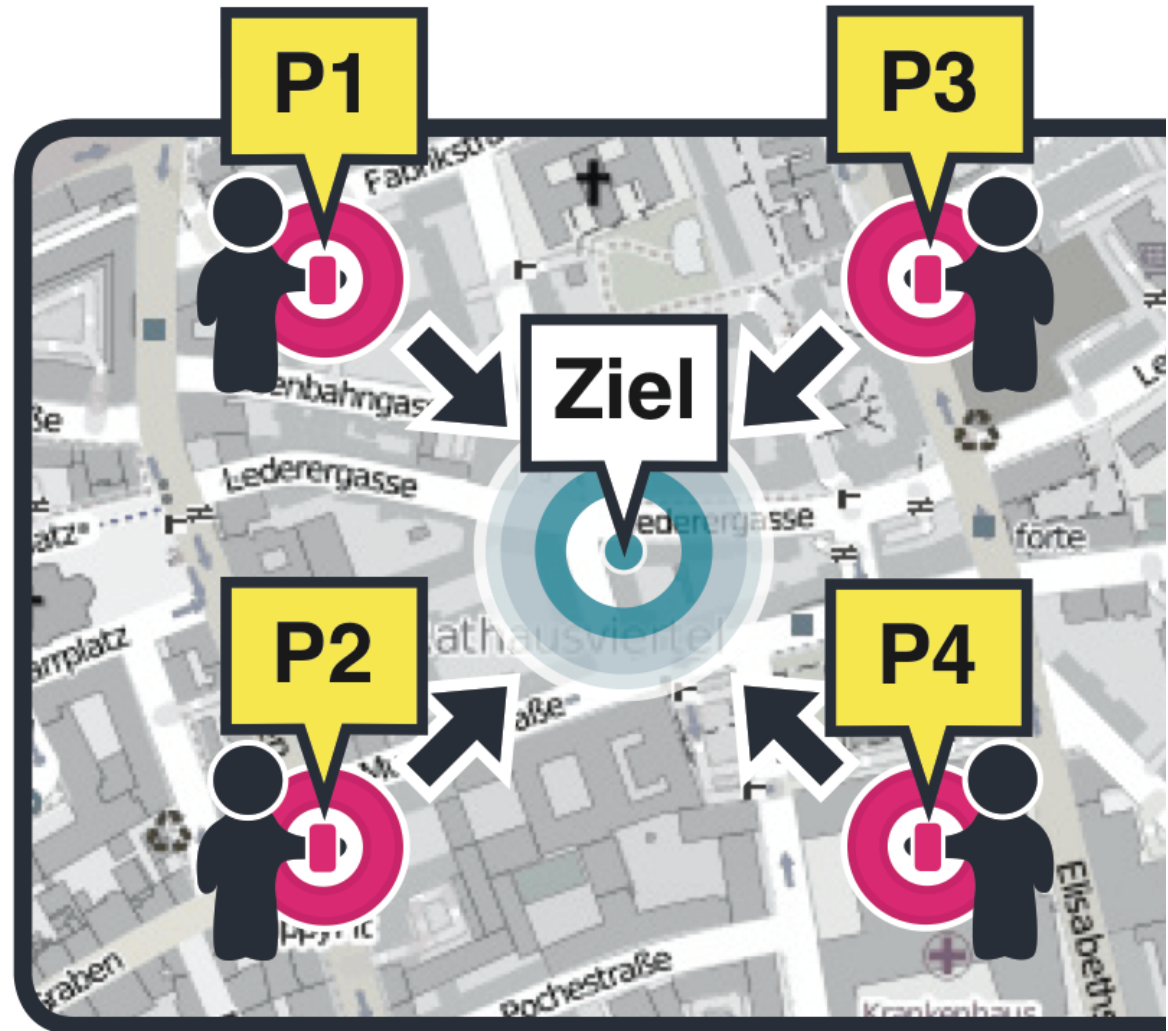
Geo Logistics Hödlmayr

Real Use-Case



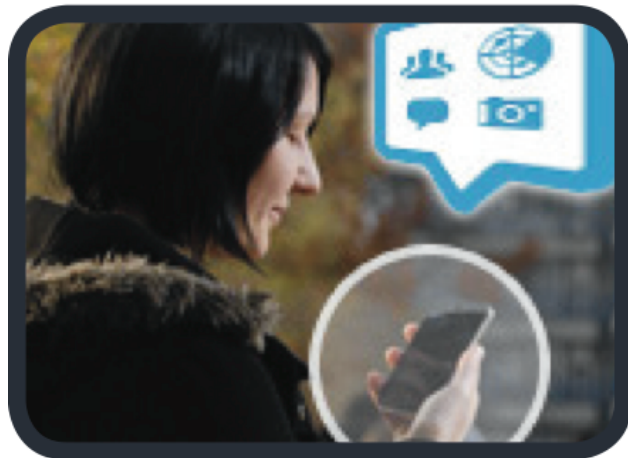
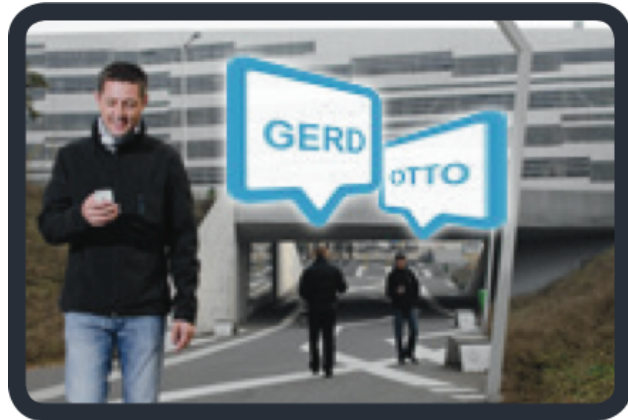
Special Forces “Cobra”

Real Use-Case



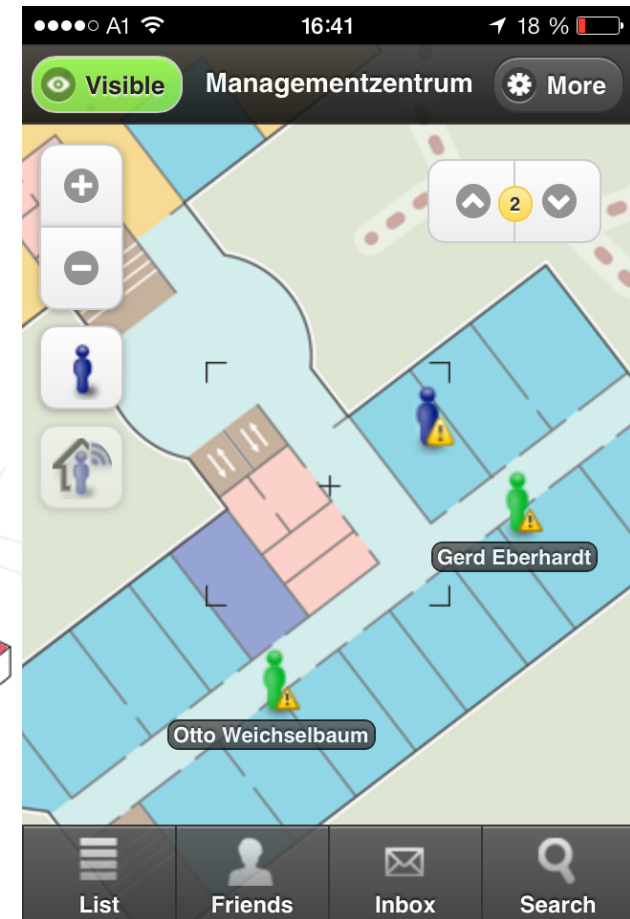
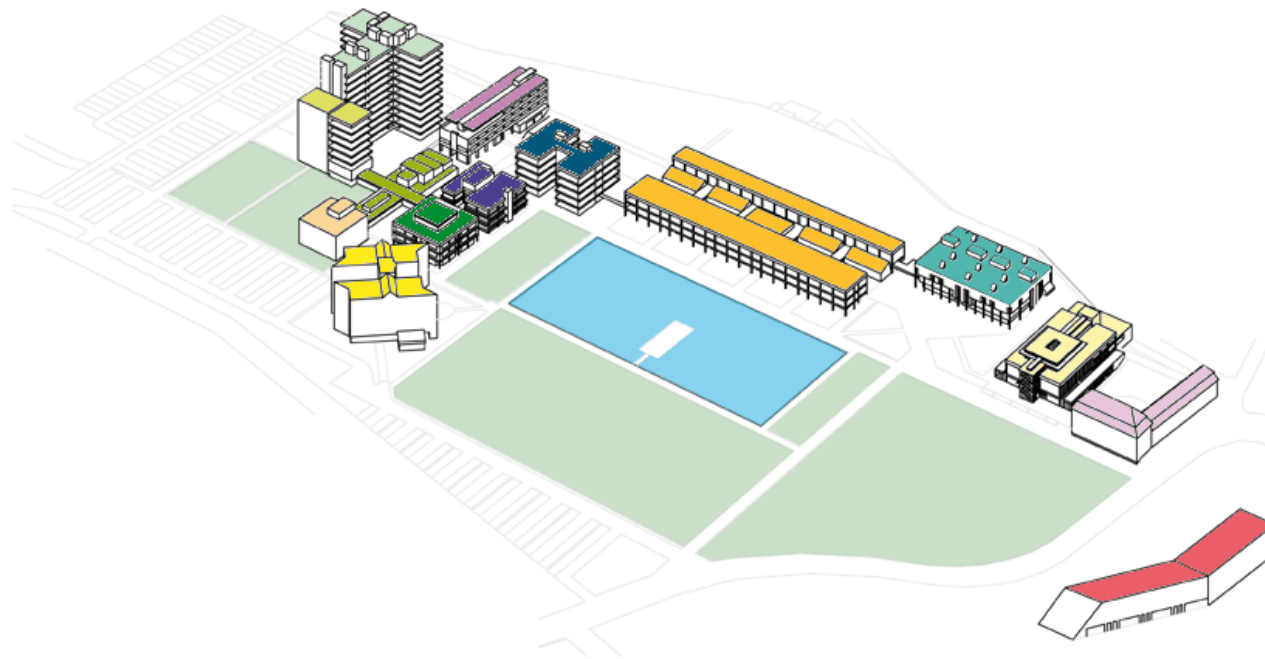
Smart Information Campus

Real Use-Case



Indoor Localization

Fingerprinting System (JKU and Siemens)



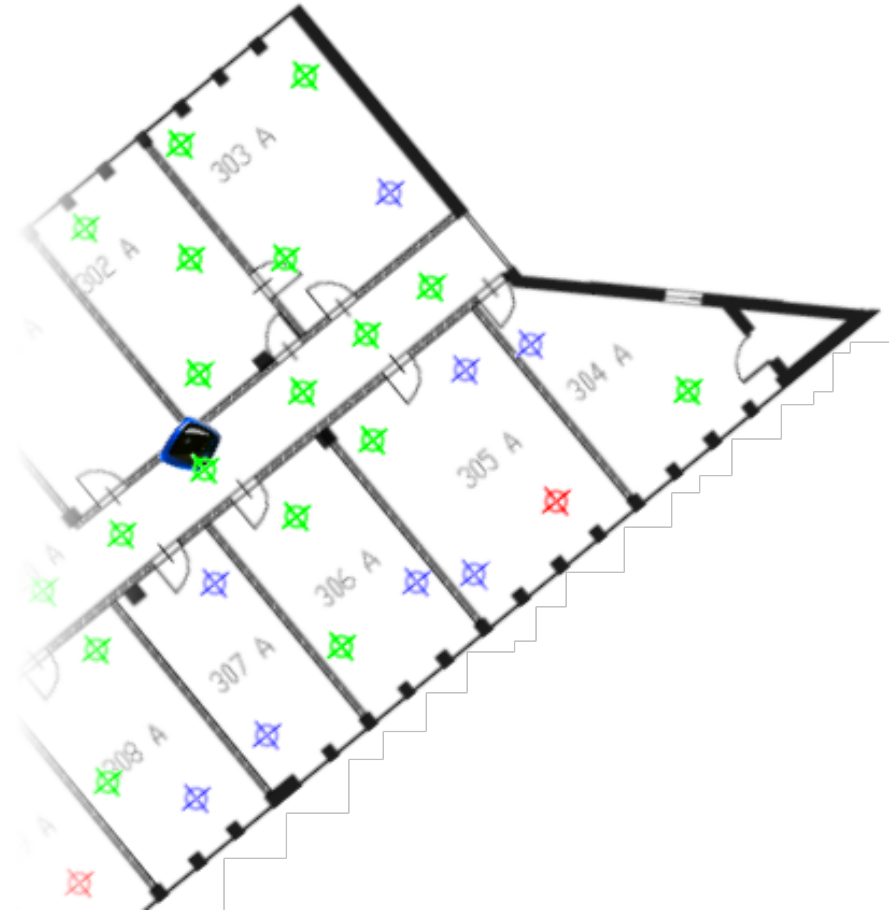
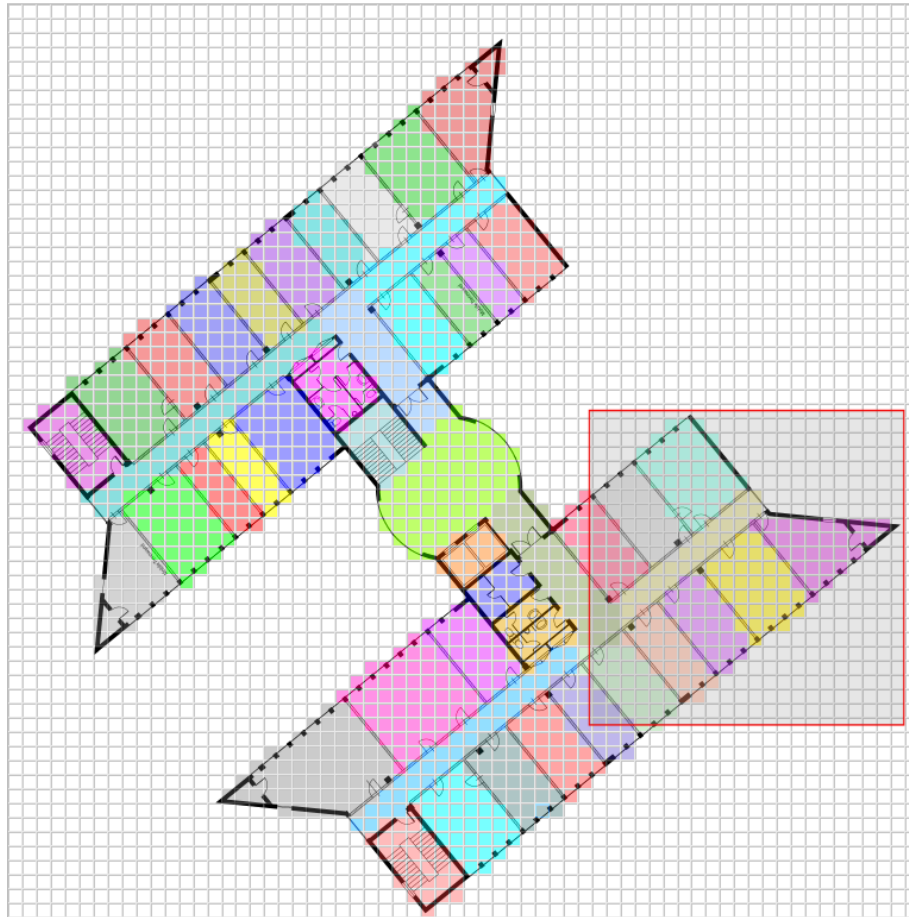
Indoor Localization

Fingerprinting System (JKU and Siemens)



Indoor Localization

Fingerprinting System (JKU and Siemens)



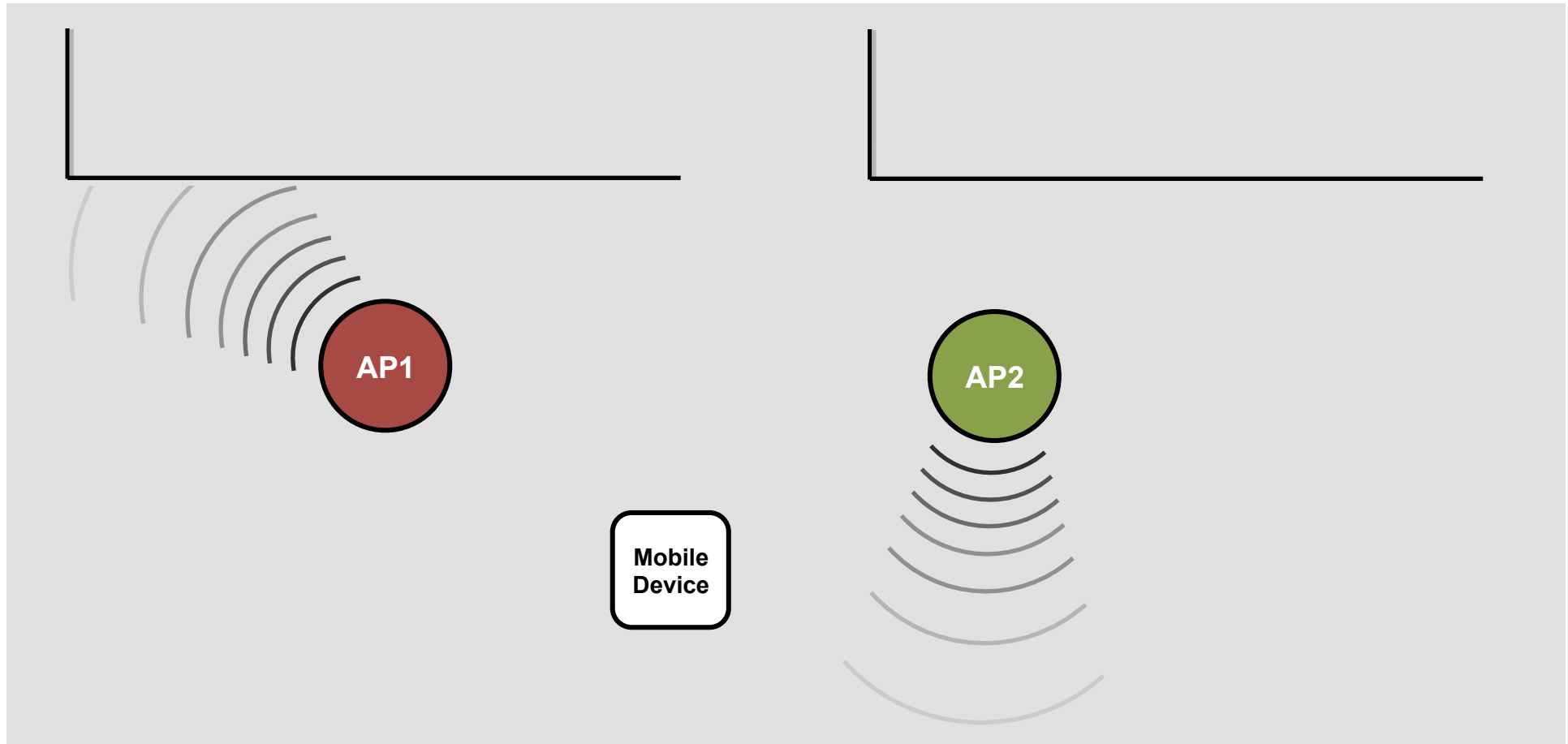
Indoor Localization

Fingerprinting System (JKU and Siemens)



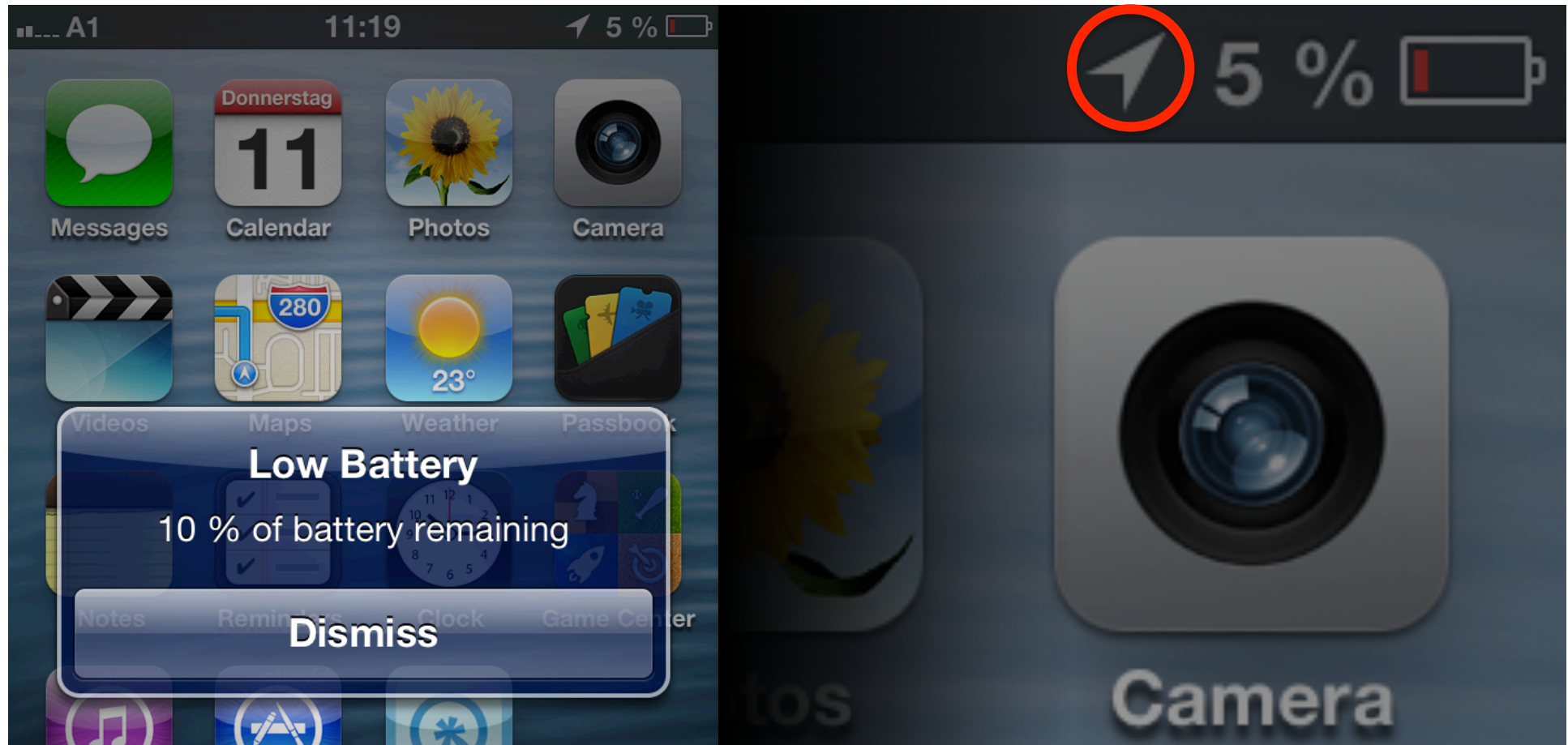
Indoor Localization

Future Aspects – Rotating Antennas



Energy Consumption

for Location Determination



Energy Consumption

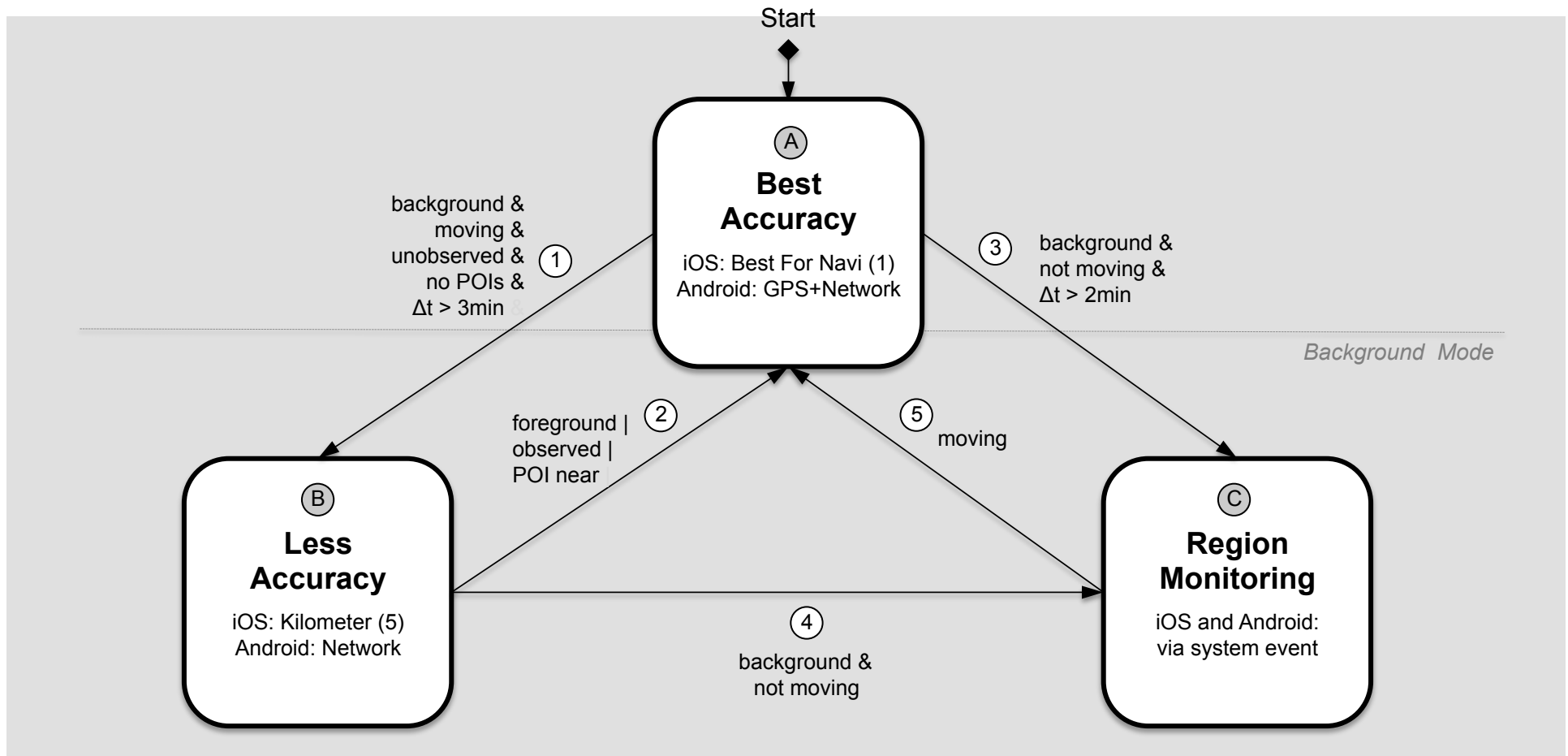
for Location Determination

Technology	Accuracy	Precision	Energy
A-GPS	10m	95%	6,616Ws
WiFi	50m	90%	2,852Ws
Cell-Id	5km	65%	1,013Ws

U. Bareth and A. Kupper, "Energy-Efficient Position Tracking in Proactive Location-Based Services for Smartphone Environments," 2011 IEEE 35th Annual Computer Software and Applications Conference, July 2011, pp. 516–521

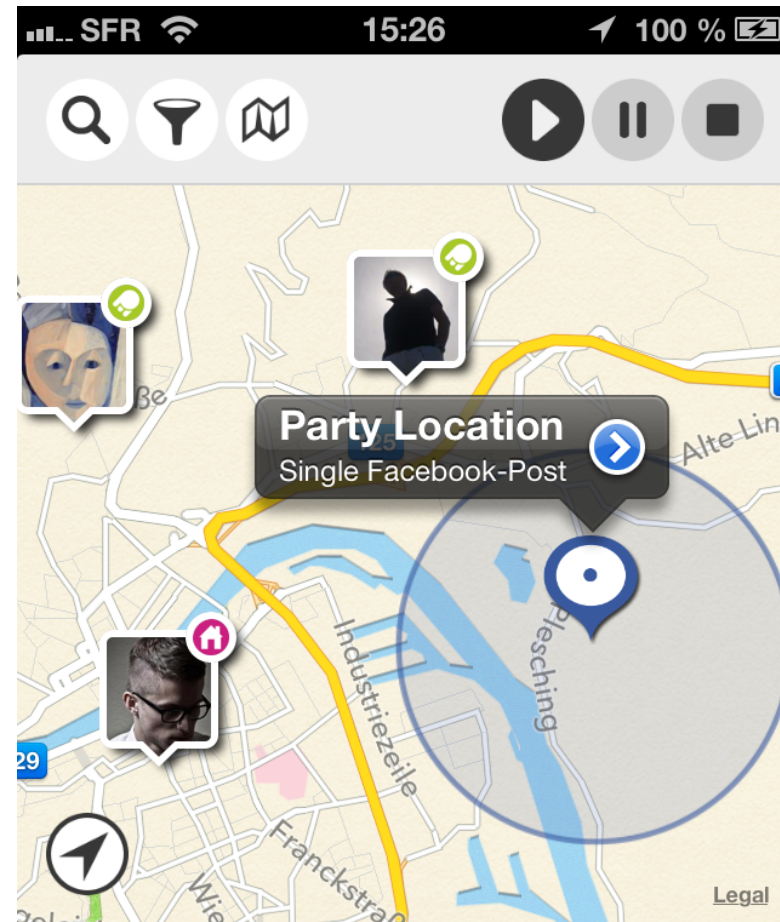
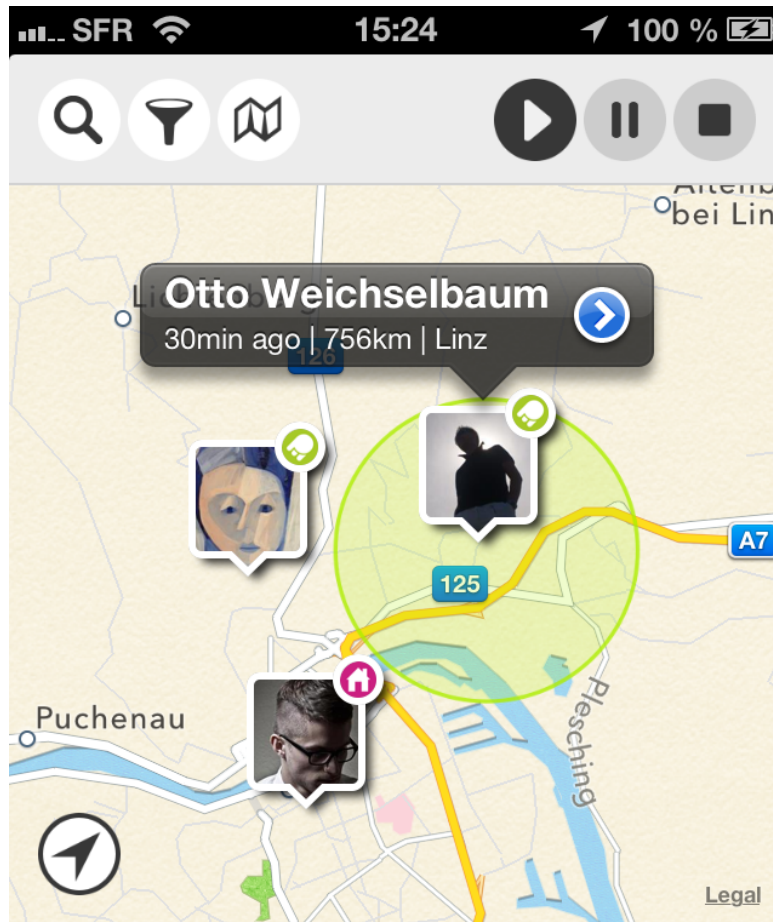
Energy Consumption

Finite State Machine for Energy Savings



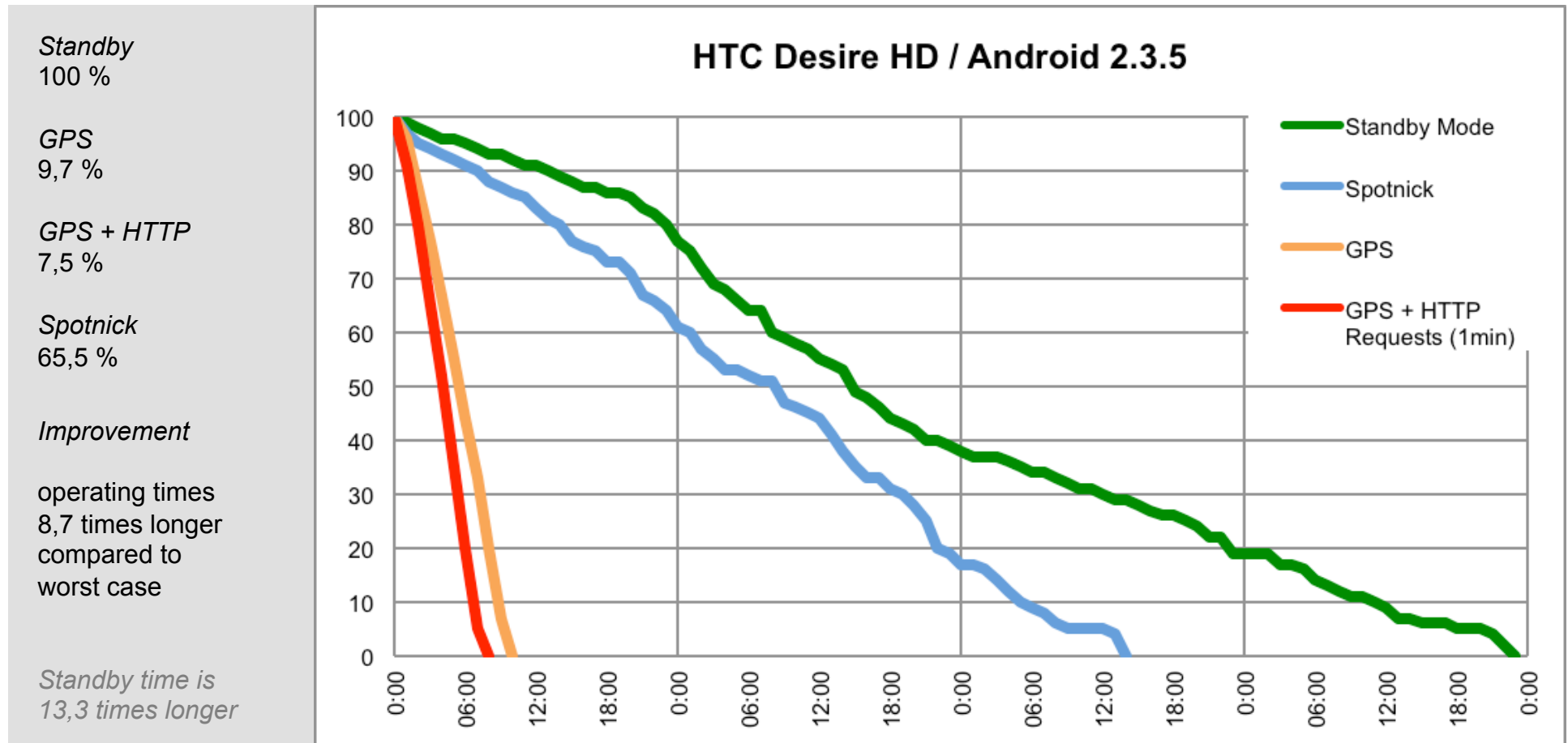
Energy Consumption

Implementations in App "Spotnick"



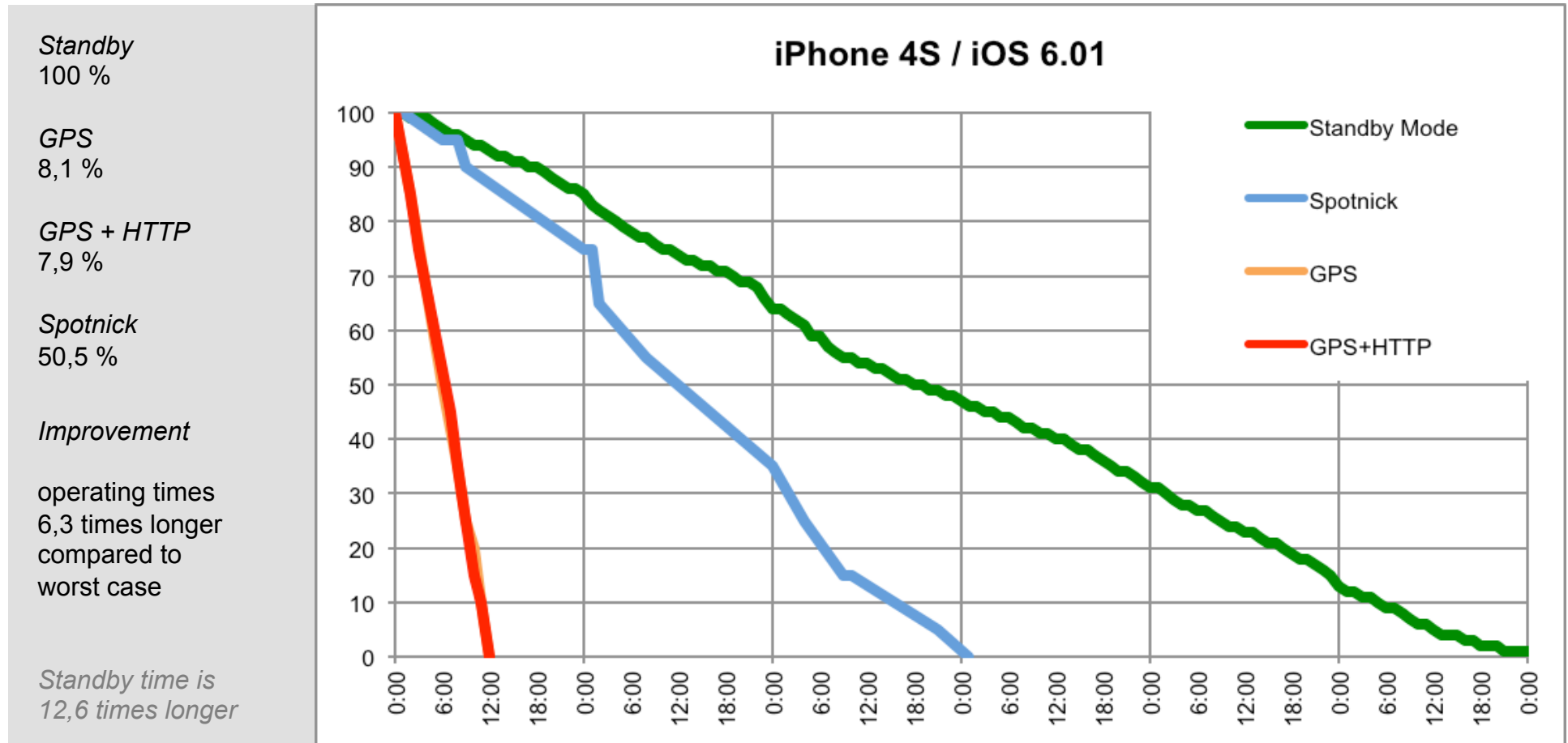
Energy Consumption

HTC Desire HD / Android 2.3.5



Energy Consumption

iPhone 4S / iOS 6.01



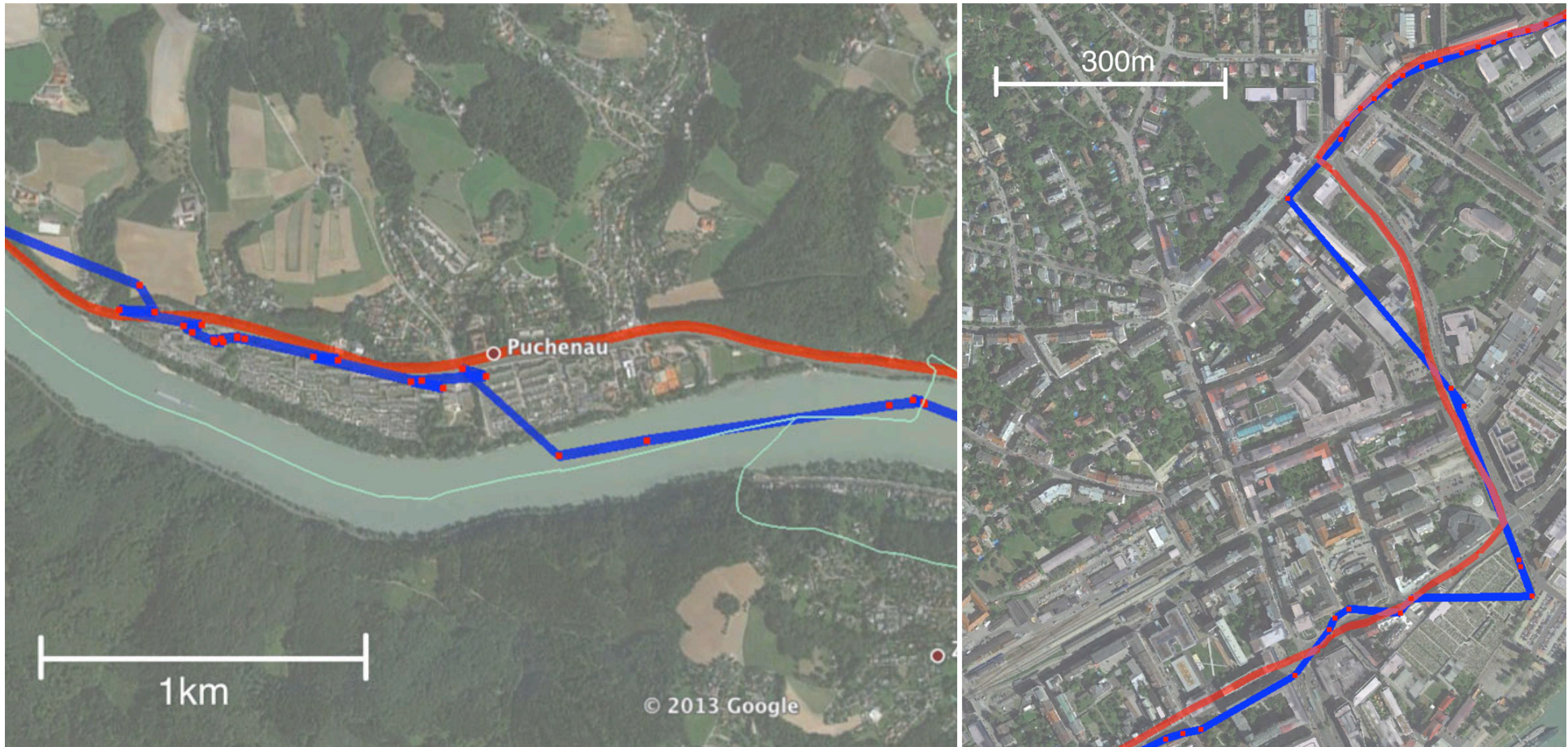
Accuracy

iPhone 4S / iOS 6.01



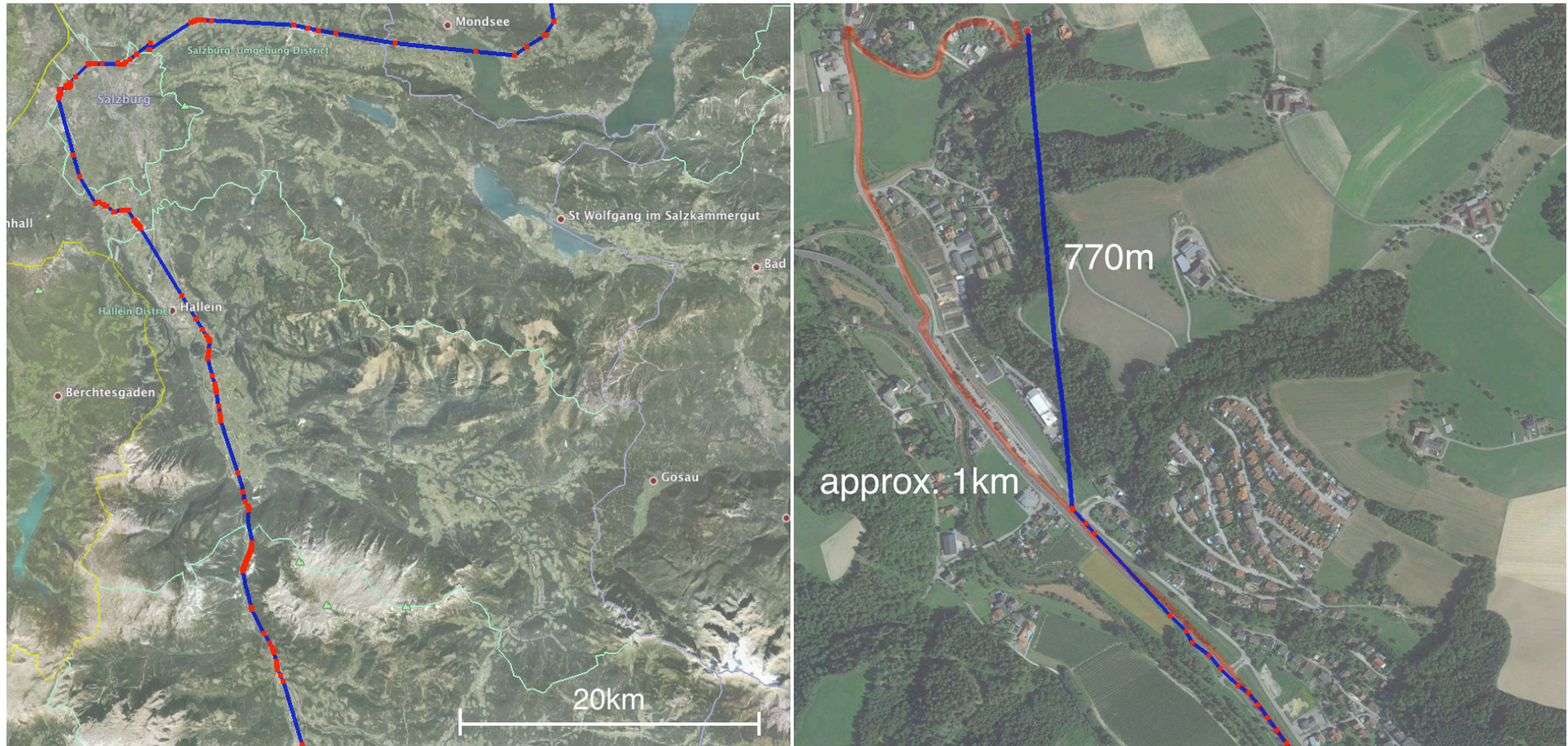
Accuracy

HTC Desire HD / Android 2.3.5



Accuracy

Limitations



Recent Projects

VIATOR – Interaction Paradigms for Disabled People



Prospect

Individual Navigation Instructions



In 50m turn left

Turn left now!

After the gate turn left

Prospect

Innovative Interaction Paradigms using LBS

