
JADE
investing in life and health
CAPACITIES
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INTRODUCTION OF JADE PROJECT

This project is financed by the European Commission and made possible by the VII Framework Programme

Project acronym: JADE

Project full title: Joining Approaches for the integration and Development of transnational knowledge clusters policies related to independent living of Elderly

Call identifier: FP7-REGIONS-2010-1, Capacities

Duration: 3 years (01/02/2011; 31/01/2014)

EC Contribution: 2.819.904,00 euros; Cost: 3.202.785,00 euros

Coordinators: SVIM Sviluppo Marche SpA and Marche Region (IT)

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Consortium as a whole :

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5 Regional RDC:

1. **MEDIC@LPS** –(FR)
2. **SEHTA** – South East Technologies Health Alliance (UK)
3. **HELSINKI RDC** (FI)
4. **ISTANBUL CLUSTER** (TR)
5. **I-LIVE** (IT)

Clusters are composed by :

- **Research Organization and Universities** (i.e. Sabancy University)
- **SMEs and business entities (**Indesit)
- **Regional authorities and RDA** (i.e.Marche Regional Authority)

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JADE objectives are to:

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Define a common research agenda, driven by needs of the elderly in the area of ambient assisted living leading to the creation of a joint action plan which will help drive EU research and policy agendas

Foster transnational scientific cooperation and collaboration between clusters of assisted living

Raise, share and disseminate knowledge and develop common approaches to enhance research and policy effort in ambient assisted living.

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS

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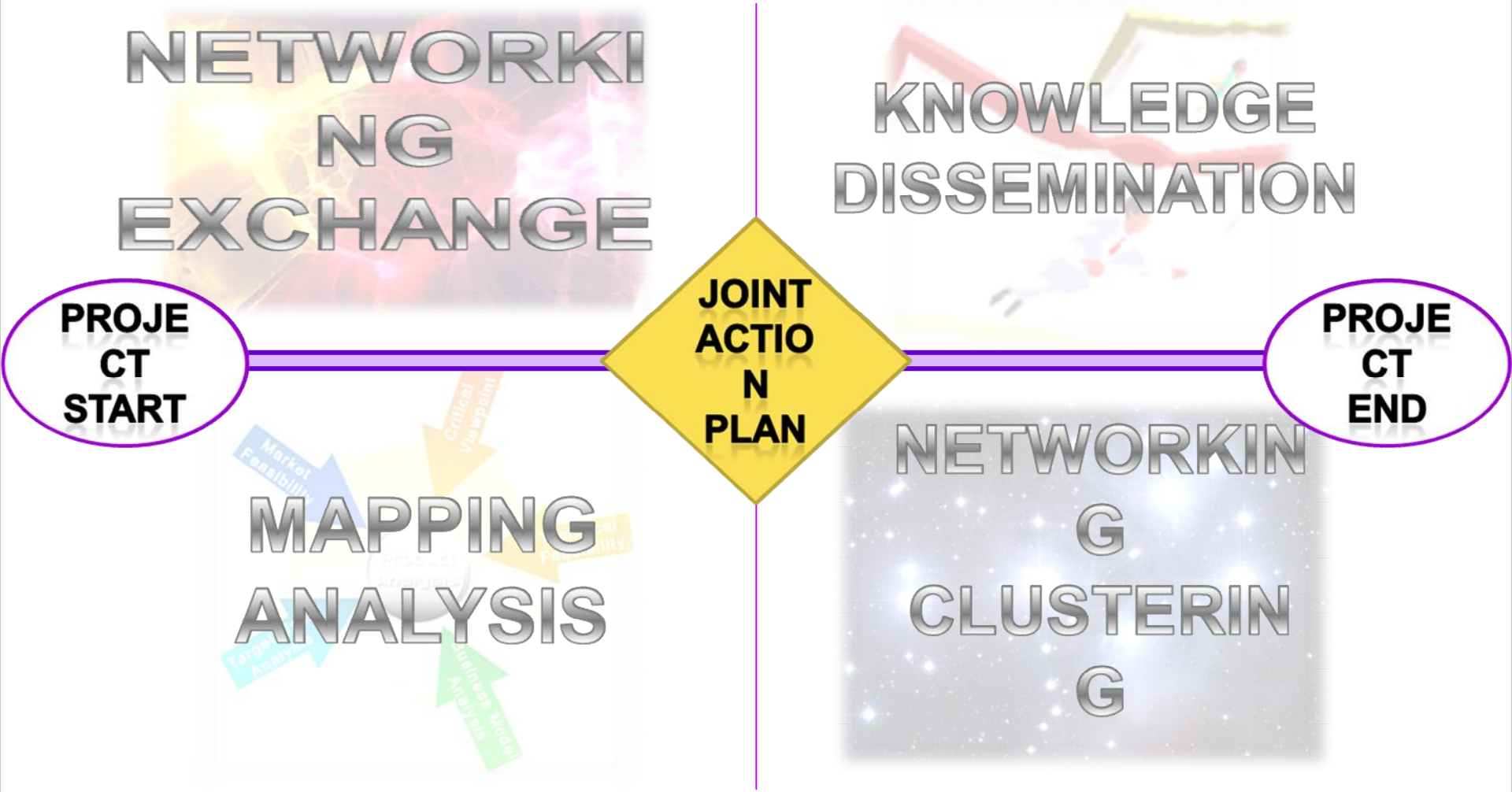

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS

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JOINT ACTION PLAN

an overall Joint Action Strategy and Plan for healthy ageing to foster economic development through research and technological development activities

at 18th month (July 2012)

How to get to JAP?

- Networking Exchange
- Mapping Analisys

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS (1/4)

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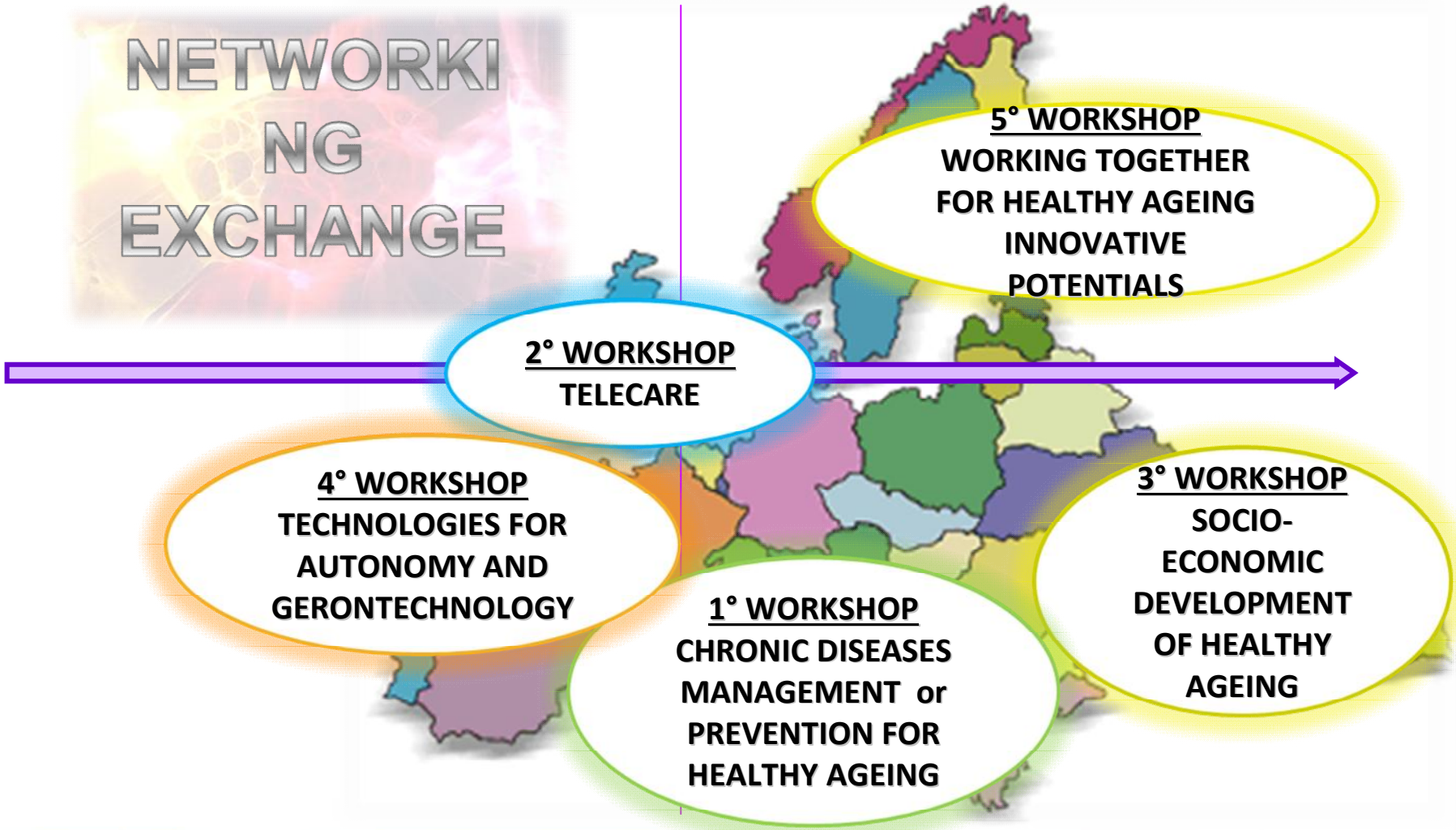

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS (2/4)

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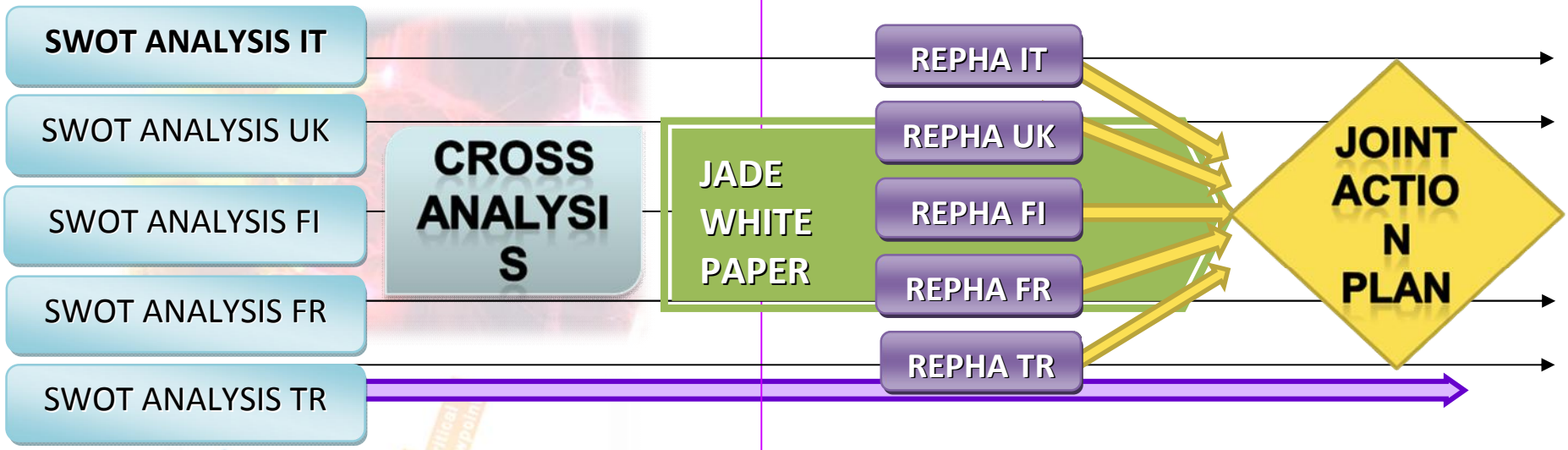

MAPPING ANALYSIS

JADE ETHICAL CODE

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS (3/4)

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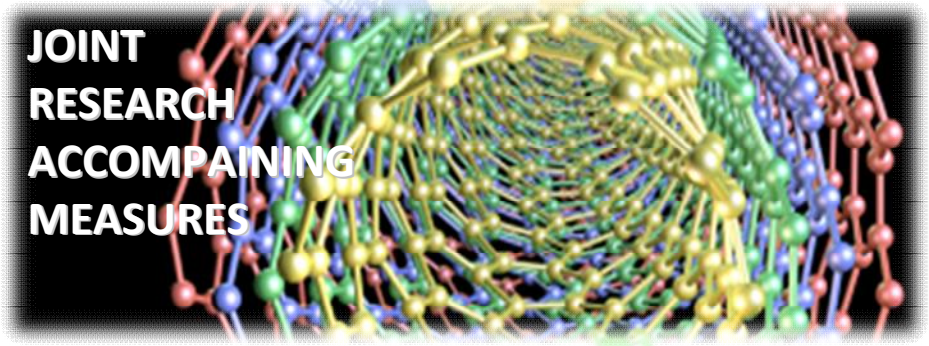
HEALTHY AGEING
INNOVATION LAB



NETWORKIN
G
CLUSTERIN
G

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THE 4 FUNDAMENTAL CONCEPTS/ FOUNDATIONS (4/4)

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First cross-mentoring workshop and stocktaking Lab	UK, December 2012
Second cross-mentoring workshop and stocktaking Lab	Finland, June 2013

KNOWLEDGE DISSEMINATION

FAVORING RDC KNOWLEDGE INTEGRATION

SPREADING EXCELLENCES

EXPLOITING SYNERGIES & RESULTS

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Mobility program

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Hails

Hail 1 - LIVING LAB METHODOLOGY led by MEDIC@LPS

Hail 2 – REGIONAL AWARENESS RAISING OF A LARGE PUBLIC TO THE BENEFIT OF ASSISTIVE TECHNOLOGIES led by Sabanci University

Hail 3 – TO PROMOTE INNOVATION TO GUARANTEE SUSTAINABLE, COMPETITIVE AND HIGH QUALITY AAL PUBLIC SERVICES FOR HEALTHY AGEING led by Marche Regional Authority

Hail 4 – DEPLOYMENT OF ASSISTIVE TECHNOLOGIES FROM LOCAL TO EU LEVEL - Identification of "excellent case studies" transferable from one country to another led by SEHTA

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Expression of Interest

- **JADE Pillar II Action 3**
  Deploying ICT solutions to help older people stay independent and more active for longer
- Those 3 actions are connected with each other:
  - Action 1
    - *EU funding opportunities identification related to JADE topics*
  - Action 2
    - *EU funding opportunities identification related to JADE topics*
  - Action 3
- *Launch and implementation of the call for Expression of Interest for joint innovative research projects/proposals*

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Expression of Interest

- **JADE Pillar II Action 3**
  Deploying ICT solutions to help older people stay independent and more active for longer
- Project description : title
- Innovation:
- User's need
- Lead partner/ coordinator
- Partners already identified in its own ecosystem:
- Partners search in JADE partner's network:

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Action 3 : Expression of Interest

- **Step 1: Drafting of 1 EoI /RDC (March 2013)**

Each RDC leader has to send to all the other RDCs 2 slides describing its EoI with: Project description; Innovation; Partners already identified; Partners search.

- **Step 2: 12 EoI collected (5 expected) (June 2013)**

Dissemination and identification of potential local project partners and connection with the RDC leader in charge of the EoI.

- **Step 3: Consortium building EoI (July 2013)**

A xls template send to RDCs to monitor consortium building :

- a global file in which each RDC lead coordinator can report on their consortium building for their own projects,
- a file for each EoI where each RDC can collect and report expression of participation from their local actors to all the EoI.
- Identification of precise partners and specific competencies bring to the project are required.

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Action 3 : Expression of Interest

- **Step 4: Presentation and round table on the « project ideas » during Helsinki workshop (mid june 2013)**

GO/NO GO decisions on going futher with all projects/ or selected projects or merged projects (criterias to be defined)

- **Step 5: Drafting of the concept notes and sending to Medic@lps (September 2013)**

Integration of next programming period "requirements":

- SMEs involvement (SBIR : 3 phases : concept, demonstration & commercialization)
- Living lab &/or Open Innovation methodologies: linking social and technology innovation, Focused on model services and applications.

Capitalizing on Hail's JADE good practices

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North America eHealth Learning Expedition Montreal/Boston 2013

October 19-24, 2013

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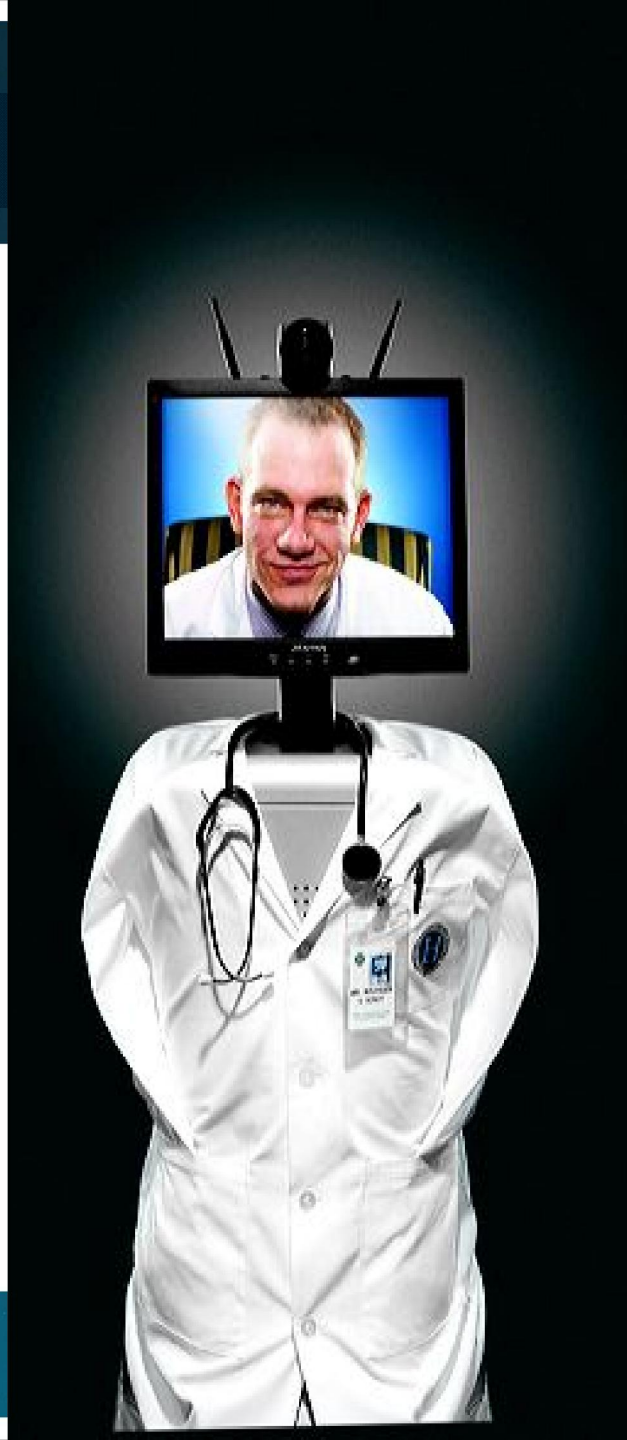
North America eHealth Learning Expedition, 2013

Overview

"***Improving the experience of care***, ***improving the health of populations***, *and* ***reducing per capita costs*** *of healthcare"* are the 3 main pillars that the US and Canadian governments are addressing in one of the most of important reforms in history.
The US and Canadian healthcare system is considerably changing. The burning question, now, is: how is this going to happen?

This one week learning expedition offers you a better understanding of the IT Health trend and its business model in the North America.



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North America eHealth Learning Expedition, 2013

An inclusive week designed to learn everything about the eHealth trends in North America.

Date & Locations

PART1: October, 19th : Montreal, Canada

PART 2: October 21-25th : Boston, USA

Heart of the global life sciences industry and one of largest concentration for medtech companies and care institutions

Benefits

✓Overview on **US/Ca Connected Health** trend & market

✓Sharing Best Practice with European **Success Stories**

✓Partnering opportunities for **EU-US/Ca collaborative** projects

✓Pitch session in front of **1500** health technology leaders

✓Networking opportunity with **VC, technologic partners, insurance and users**

✓Visit of **3** major innovative sites in Connected Health

Events

Study visit will be connected with 2 main congresses

3rd EU-US eHealth Marketplace Workshop 2013

10th Connected Health Symposium 2013

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An Intelligent Software System for Elderly Care

Sabancı University, Computer Science and Engineering, 2011

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Assistive Technologies for Elderly

Problem:

- Although the Turkish population is the youngest among other European countries, the elderly population is about 8.6%.
- Forecasts suggest that this ratio will exceed 15% in 10 years.
- Care and assistance for the elderly's problems requires a considerable amount of labor.

Solution:

- Assistive Technologies:
  - **Intelligent** and **automated aiding systems** which are capable of **monitoring** the elderly's **well-being** and **notifying** the care-taker in case of an **emergency**.

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Our Project

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- **Collecting** GPS location, heart rate and accelerometer **data** through **wearable sensors**,
- **Analyzing** and interpreting the collected data in a **completely unsupervised** manner by the **software system** we developed.

Goal

- To be able to **extract** the user's **daily routine** and habits, **without any human intervention**,
- **Notifying** the care-takers in case of an **emergency situation**.

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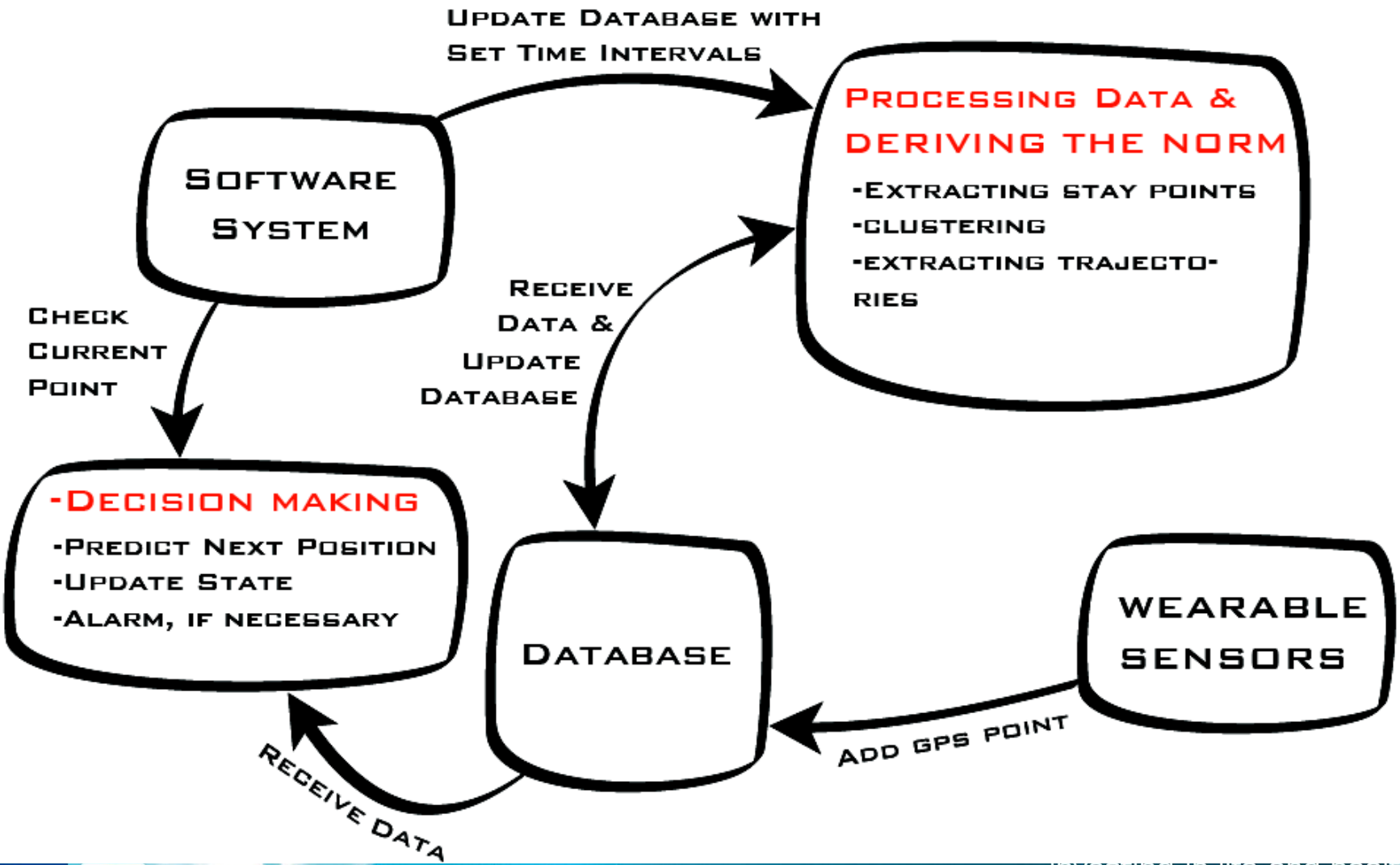
Overview of Our System



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How It Works?

The core of our system has 2 main parts:

Learning the norm:

- Identifying the most frequently visited places (hub-points)
  - **Where** does the user spend his time **at a certain day at a certain time** interval?
  - **Transitions** between those places
- Extracting the **trajectories**
  - **How** does he go to a certain place?
  - **Which routes** does he take?

Inference based on past behavior:

- Predicting the next location when he is traveling.

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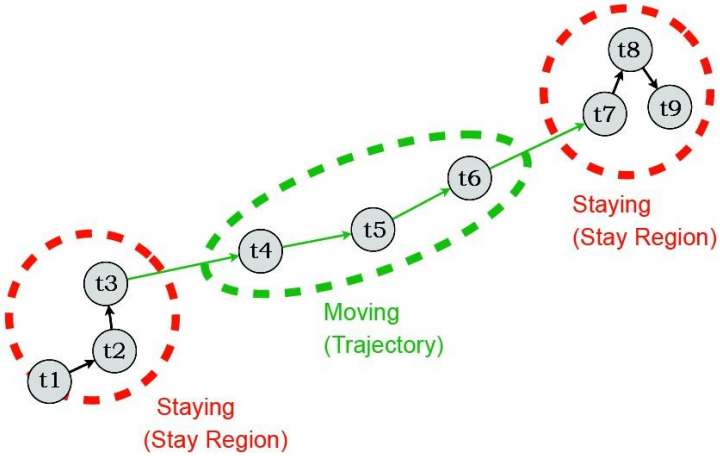
Identifying the Hub-Points

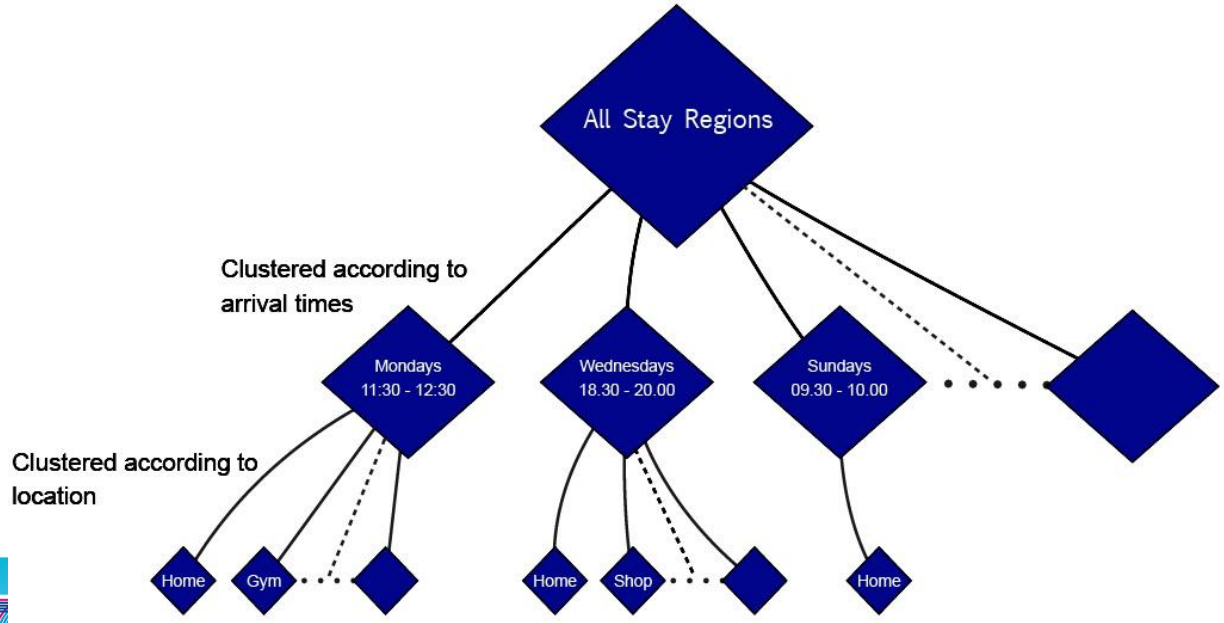
- **Stay region**[2]: a geographic location where a user has spent at least $T_{threshold}$ time within an area of $D_{threshold}$ distance



- These stay regions most frequently occur either when the user:
  - remains stationary or,
  - spends time outdoors for more than a certain time threshold or,
  - enters into a building where the GPS signal is lost

Identifying the Hub-Points

- **Clustering** stay regions by **time of arrival** (time-clusters)
  - Visited places are now grouped into days and times.
- **Clustering** each time-cluster by **distance** (distance-based clusters)
  - Each stay region in each time-cluster is now distinguished into distant geospatial regions.



Each sub-cluster
-is a potential hub-point,
-carries great semantic information.

Mining the Trajectories

- So far, we have analyzed the user's activity when he is **stationary** and extracted the following for each hub-point:
  - **Date and time** of **arrival** and **departure** from the region
  - **Duration** of stay
  - **Frequency** of visits
  - Real world **coordinates**

- Next, we mine the **routes** he takes from one hub-point to another.

- **Trajectory:** a set of consecutive GPS points between a pair of hub-points, indicating the route followed by the user.

Test Data [2] [3]

- **The Data Set** (Microsoft GeoLife Project):
  - GPS location coordinates of a person in Beijing, China
  - collected between 05-07-2007 and 08-08-2009,
  - recorded every 2-3 seconds for 718 days,
  - consists of 734.019 points (fewness due to frequent signal breaks – 2.9 per day on average)

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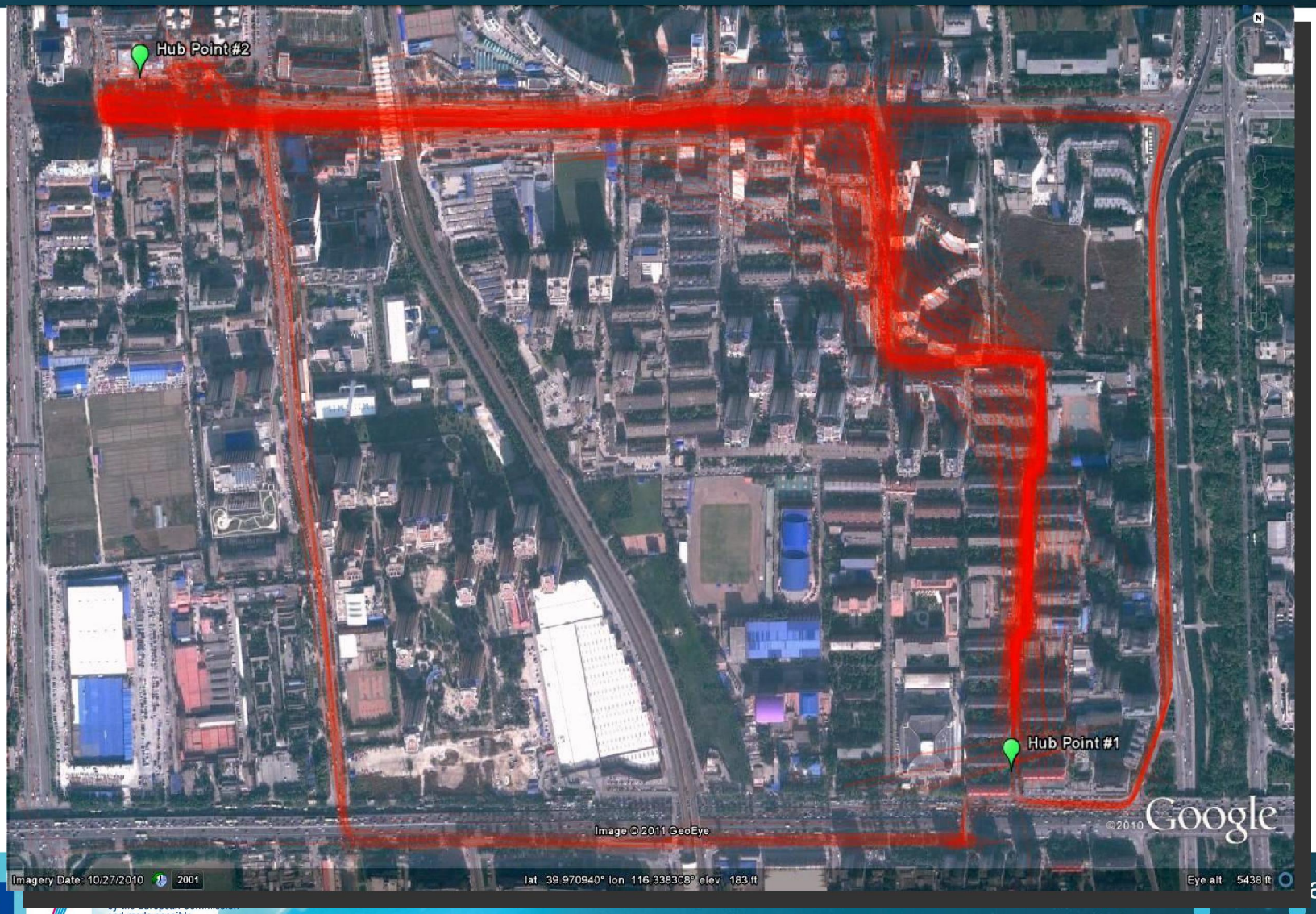
Test Results on the Microsoft GeoLife GPS Data Set



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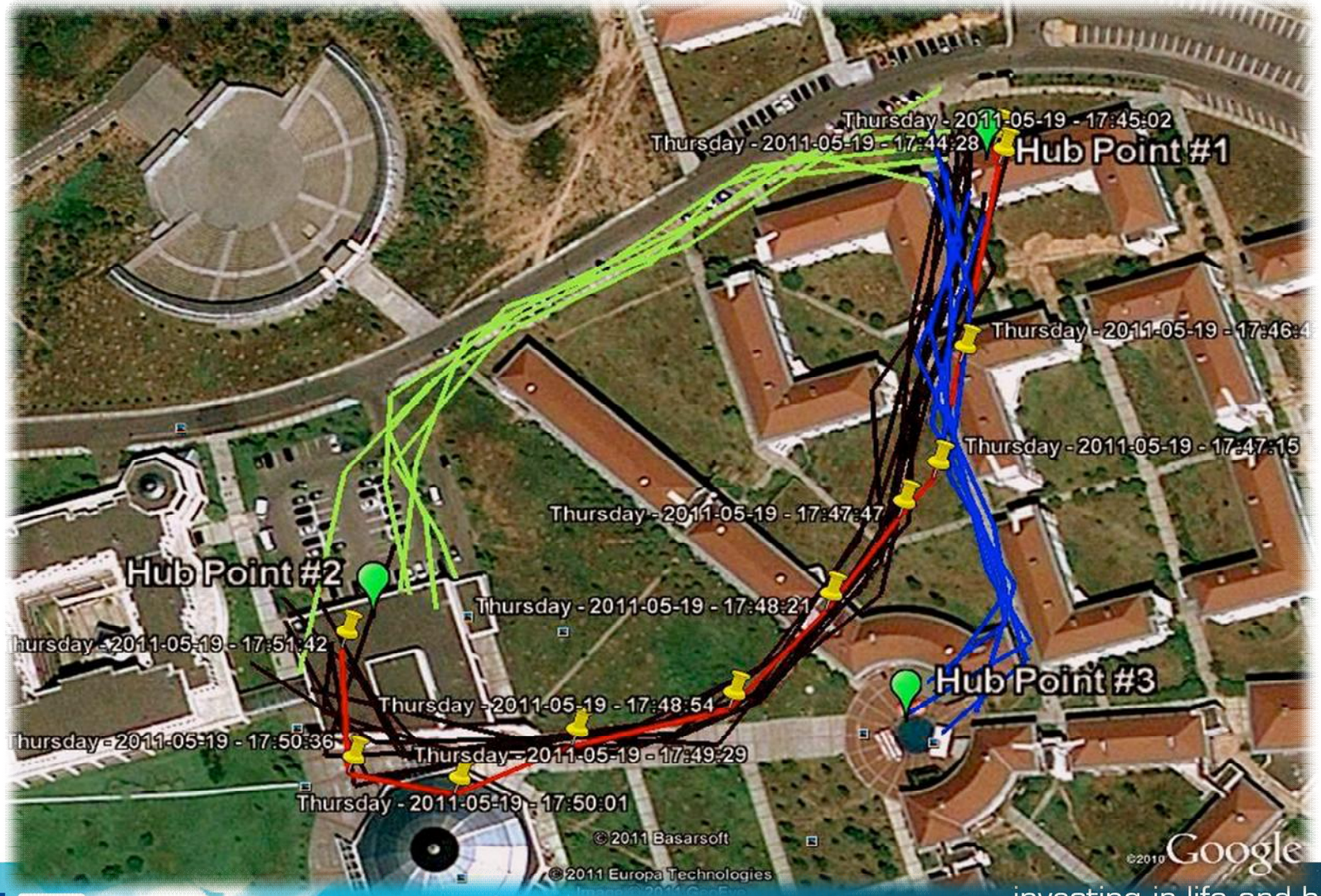
Results on Actual Data – Sabanci University Campus

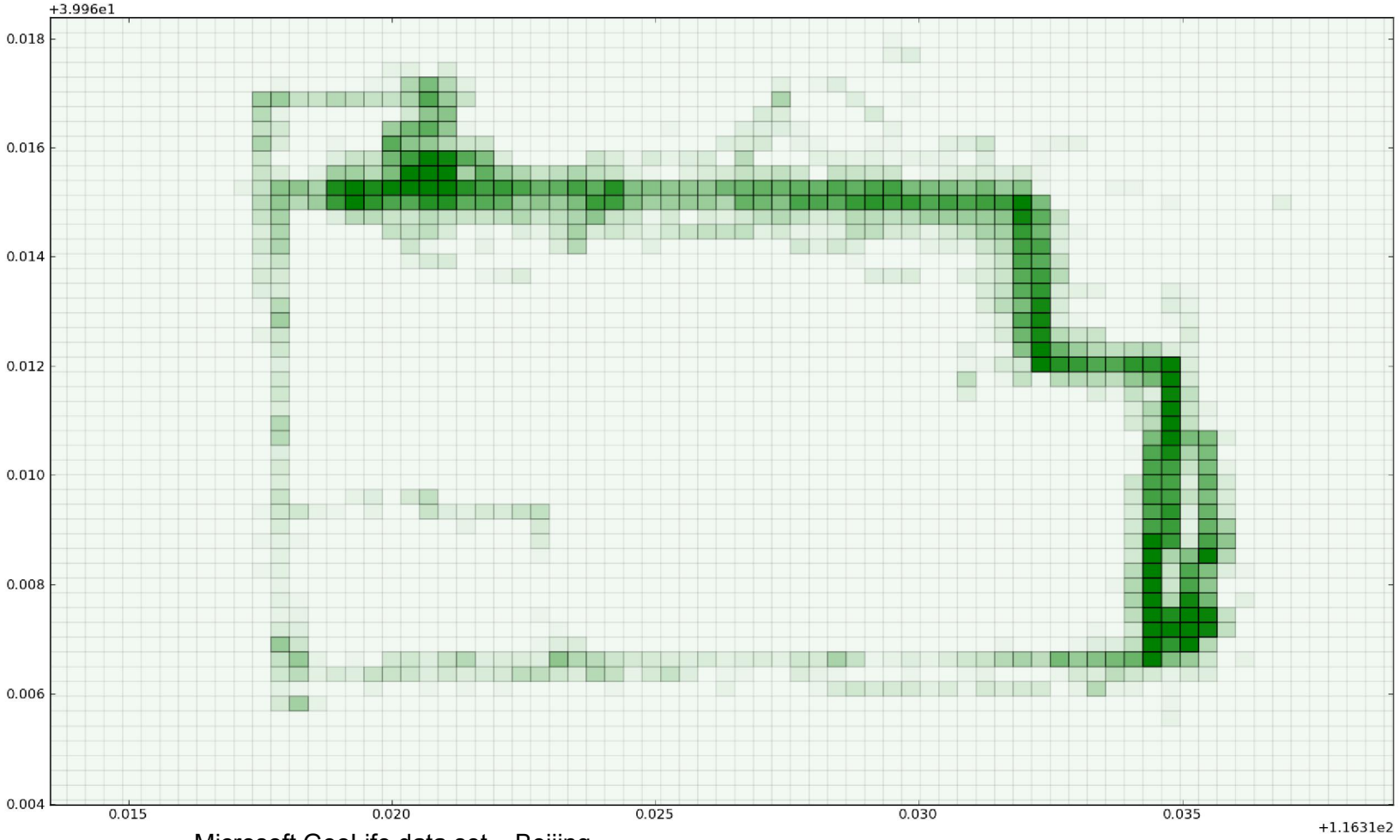


Predicting Next Location

- **The Grid Approach:** The city is divided into **evenly sized cells**.
- Each GPS point in the data set is mapped on to the grid.
- For each cell that contains a GPS point;

  P(CurrentCell=i | PreviousCell=j) is computed.
- When the user is wandering around, the next cell he may step into is predicted, based on the probabilistic model.
- Each time the user is about to move on to another cell, **3 guesses are made**.
- If all 3 **guesses** do **not succeed** for **3 consecutive cell changes**, then that means the user has **deviated** from the usual trajectory he followed; he is following a path he has very rarely taken before.

Testing the Grid Approach



Microsoft GeoLife data set – Beijing
View focused on the two most frequently visited hub-points.
Grid cells are illuminated based on the number of GPS points mapped on to that cell.
Each cell is 50x50 meters in size.

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Testing the Grid Approach

- Beijing is divided into cells of 50x50 meters.
- The system learned the hub-points and extracted the trajectories.
- The probabilistic model is computed using only half the trajectories (from the most populated hub-point to the second most populated hub-point) .
- Testing on an arbitrary trajectory on the other half;
- Predictions **succeed with a rate of ~94%.**
- There are **no wrong guesses** 3 consecutive times.
- **Observation:** The grid approach is not affected by the different routes followed between the same set of hub-points.

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References

[1] Jones, E., Oliphant T., Peterson P. et al. (2001). Hierarchical Clustering. Scipy - Open Source Scientific Tools for Python, retrieved from http://docs.scipy.org/doc/scipy/reference/cluster.hierarchy.html on May 27th, 2011.

[2] Zheng, Y., Li Q., Chen Y., Xie, X. (2008). Understanding Mobility Based on GPS Data. *In Proceedings of ACM conference on Ubiquitous Computing* (*UbiComp 2008).* Seoul, Korea. ACM Press: 312–321.

[3] Zheng, Y., Zhang, L., Xie, X., & Ma, W. (2009). Mining Interesting Locations and Travel Sequences from GPS Trajectories. *In Proceedings of International World Wide Web Conference (WWW 2009).* Madrid, Spain: ACM Press: 791-800.

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