



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB



Km4City overview and start working on it

<http://www.disit.org/km4city>

www.Km4City.org

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Km4City Roadmap



SELECT
for Cities

2021

Snap4City

- waste
- Territorial areas and paths
- Health, Bike sharing
- Statistics, Energy, ICT, ...
- E-vehicles
- Risk analysis
- Environmental, water
- Data Licensing models
- Energy Meters
- Fi-Ware compliant 



WEEE
2017-2020
6/2017

Today

- More Sensors, IOE, IOT
- Dashboard Builder
- Territorial areas and paths
- User Engagement
- Mobility and transport
- Resilience Decision Support

GHOST SIR
2016-2019 - Started



RESilience management guidelines
and Operationalization appLied to
Urban Transport Environment

RESOLUTE H2020
2015-2018 - Started

2015

Km4City 1.5
- SmartDS
- Km4City App

Km4City 1.4

- Embed
- More API
- iBeacon



Sii-Mobility SCN
2016-2018 - Started
Km4City 1.6.2

2016

REPLICATE H2020
2016-2021- Started



REPLICATE
Renaissance of Places
with Innovative Citizenship
And Technology

- Suggestions on demand
- User Behaviour Analysis
- Trajectories and OD

2013

Km4City 1.1

- Tuscany Map
- Services
- AVM
- Sensors
- Parking
- Cultural Heritage
- Enrichment cities
- Event in the city
- Digital Locations
- Fresh places

- <http://servicemap.km4city.org> API
- <http://log.disit.org>
- <http://www.disit.org/fodd>
- <http://www.disit.org/tv> Twitter Vigilance
- <http://smartds.km4city.org>

- Weather
- Cultural Heritage
- Energy recharge pillar
- Wi-Fi
- Events in the city

2014

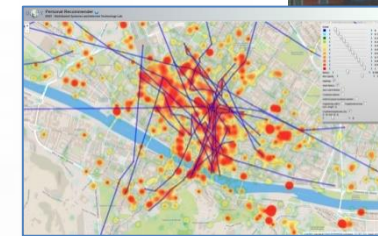
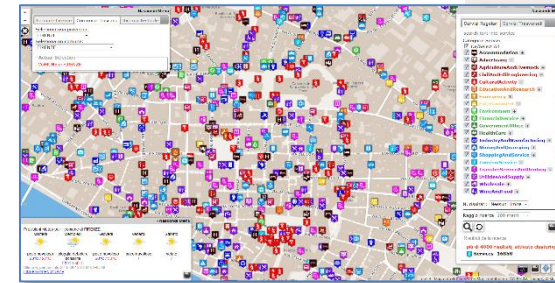
Agenda

- Km4City Roadmap
- Data and Model
- Smart City Control Room
- Smart City API
- Monitoring Traffic Flow and Parking
- Monitoring City Users via Wi-Fi
- Engaging Users Via Mobile App
- Monitoring city Users via Social Media
- Development Tools
- City Resilience and DSS
- using and Contributing to Km4City
- Info and Documents



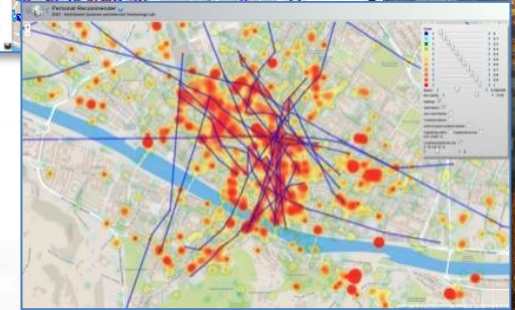
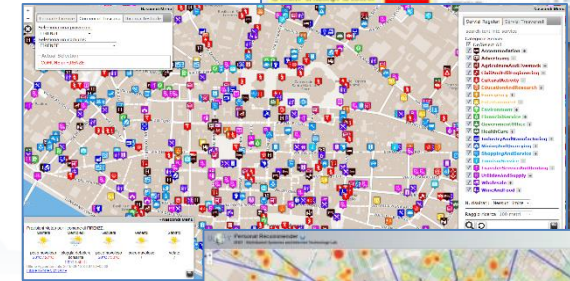
Km4City: Integrated Urban Platform

- **Aggregate & integrate data**
 - Multiple protocols from urban operators,
 - open data, IOT, sensors, internet of everything, cloud, mobile devices, Wi-Fi, social media, ...
- **Data Exploitation performing**
 - predictions, reasoning, business intelligence, ..
 - users behavior analysis, decision support system, ..
 - Control Room, Real Time Monitoring tools,
- **Produce value from data enabling to**
 - Stimulate virtuous behavior, influence City Users!
 - Put in action CITY Strategies



Sentient Urban Platform for Smart City

- Set up an ICT based Urban Platform integrated and unified data management among services, city operators and city users:
 - **Control Room, Real Time Monitoring**
 - decision support, assessing and monitoring risk and resilience
 - **Data analytics and business intelligence**
 - predictions, reasoning, city users behavior analysis, ...
 - **Reading the city: data, users behavior and needs, ...**
 - IOT, Open data sensors, private data, static and real time data.
 - **City Strategies: stimulate virtuous behavior of City Users**
 - participation, totem, twitter, Apps, etc.
 - **Transform Data into value**
 - Put in action smart city innovative solutions and services, development tools



Transport systems
Mobility, parking



Public Services
Govern, events, ...



Sensors, IOT
Cameras, ..



Environment,
Water, energy



Shops, services,
operators



Social Media
WiFi, network

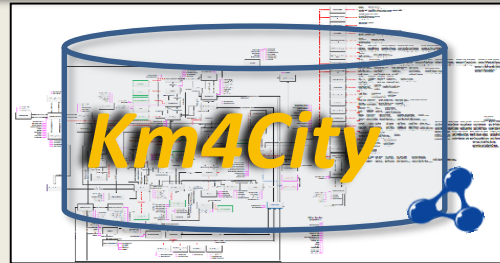


Static, Slow and Real Time data flows

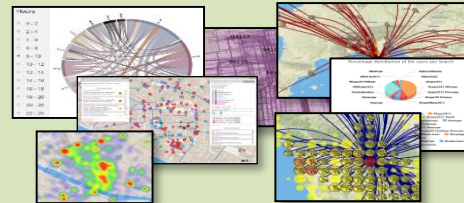
DISCES -- Distributed and parallel architecture on Cloud



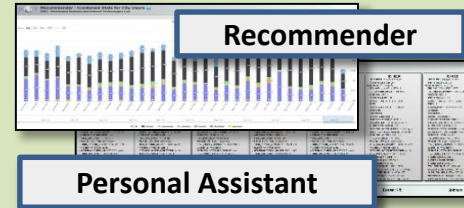
Km4City Smart City Engine



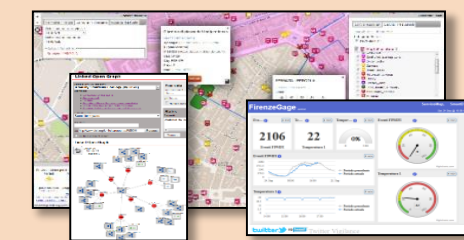
Big Data Analytics



Smartening Tools



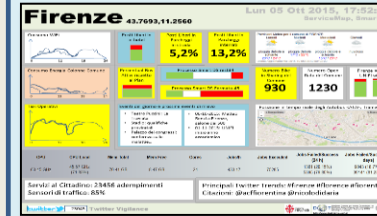
Development Tools



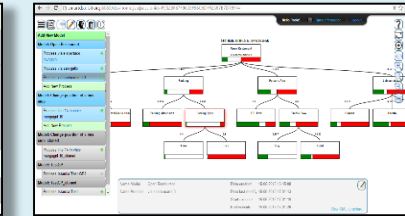
Km4City Smart City API

City Operators and Decision Makers

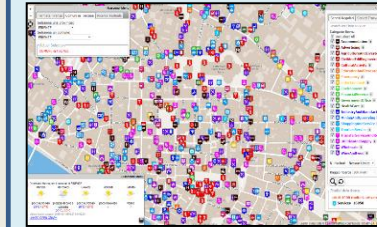
Dashboards



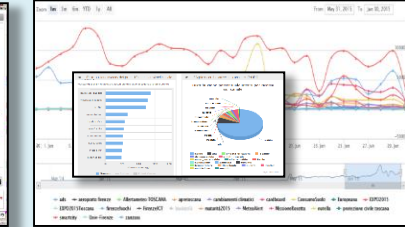
Smart Decision Support



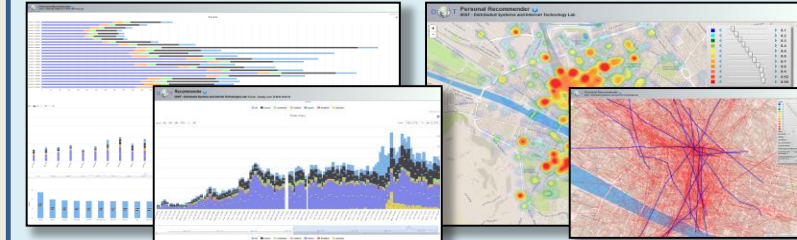
ServiceMap browser



Twitter Vigilance

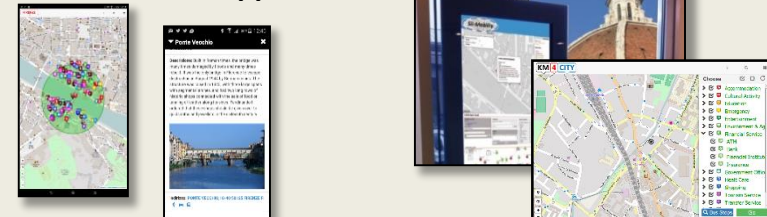


Analizers of City User Behavior



Tools for Final Users

Mobile e Web Apps



Km4City Solution



- Open Source
- Collaborative work: data, API, programming, etc.
- Decision Support: dashboard, mobile API
- Real time and statistical data
- Flexible since all tools are replaceable and architecture is modular
- Standard based: any protocol, any channel, any format
- Interoperable: any protocol at level of component, easy to integrate with present systems
- Robust: supporting HA (high availability), FT (Fault Tolerant), Cloud, → Containers
- Scalable and schedulable: DISCES

Data & Model

<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?controlRoom>

<http://www.km4city.org/?devTools>

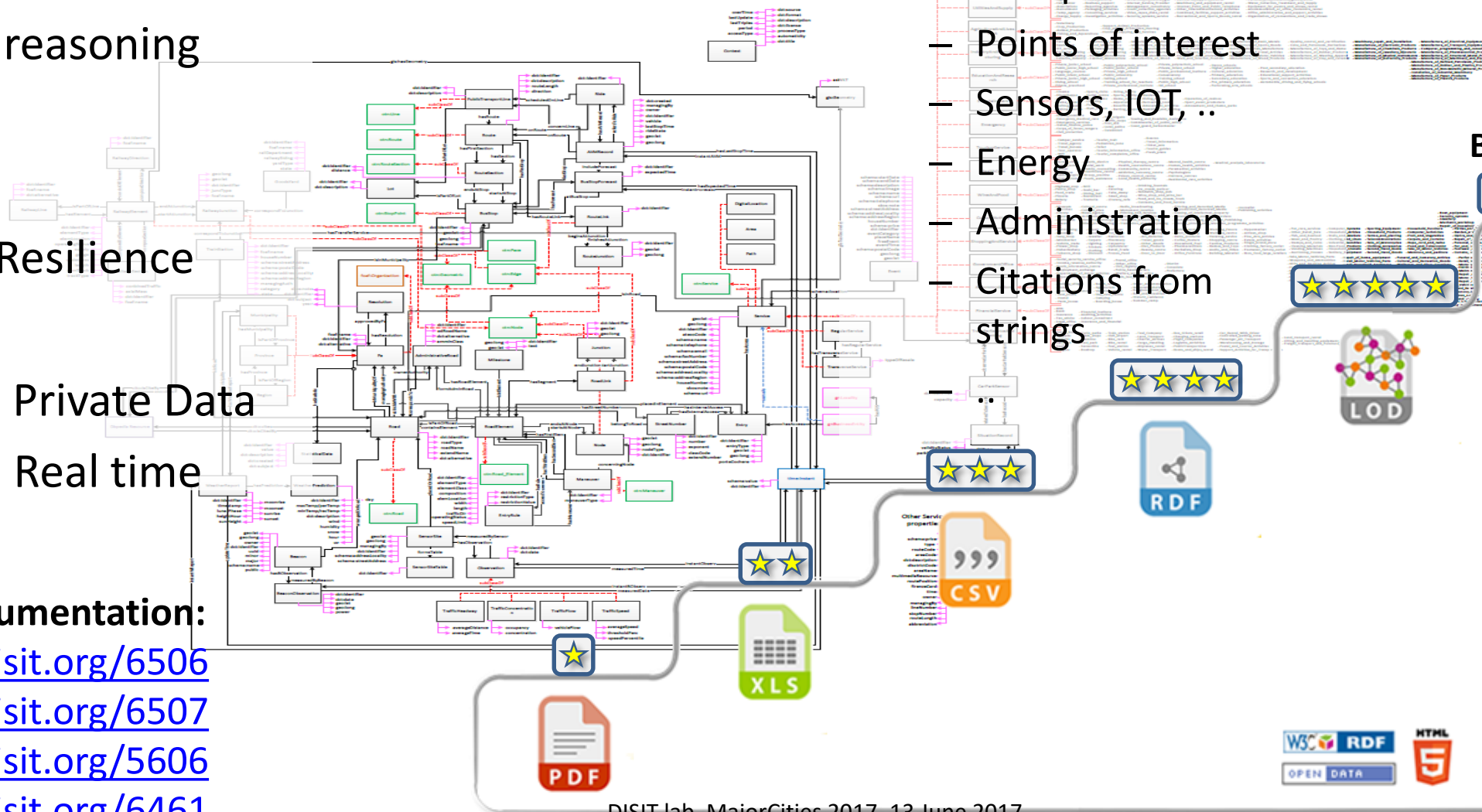
<http://www.km4city.org/?app>

Km4City: Knowledge Base



- Multiple DOMAINS
- Geospatial reasoning
- Temporal reasoning
- Metadata
- Statistics
- Risk and Resilience
- Licensing
- Open and Private Data
- Static and Real time

- Street-Guide
- Mobility and transport
- Points of interest
- Sensors, IOT, ..
- Energy
- Administration
- Citations from strings



Big Data Tools



LOD and reasoners



Ontology Documentation:

<http://www.disit.org/6506>

<http://www.disit.org/6507>

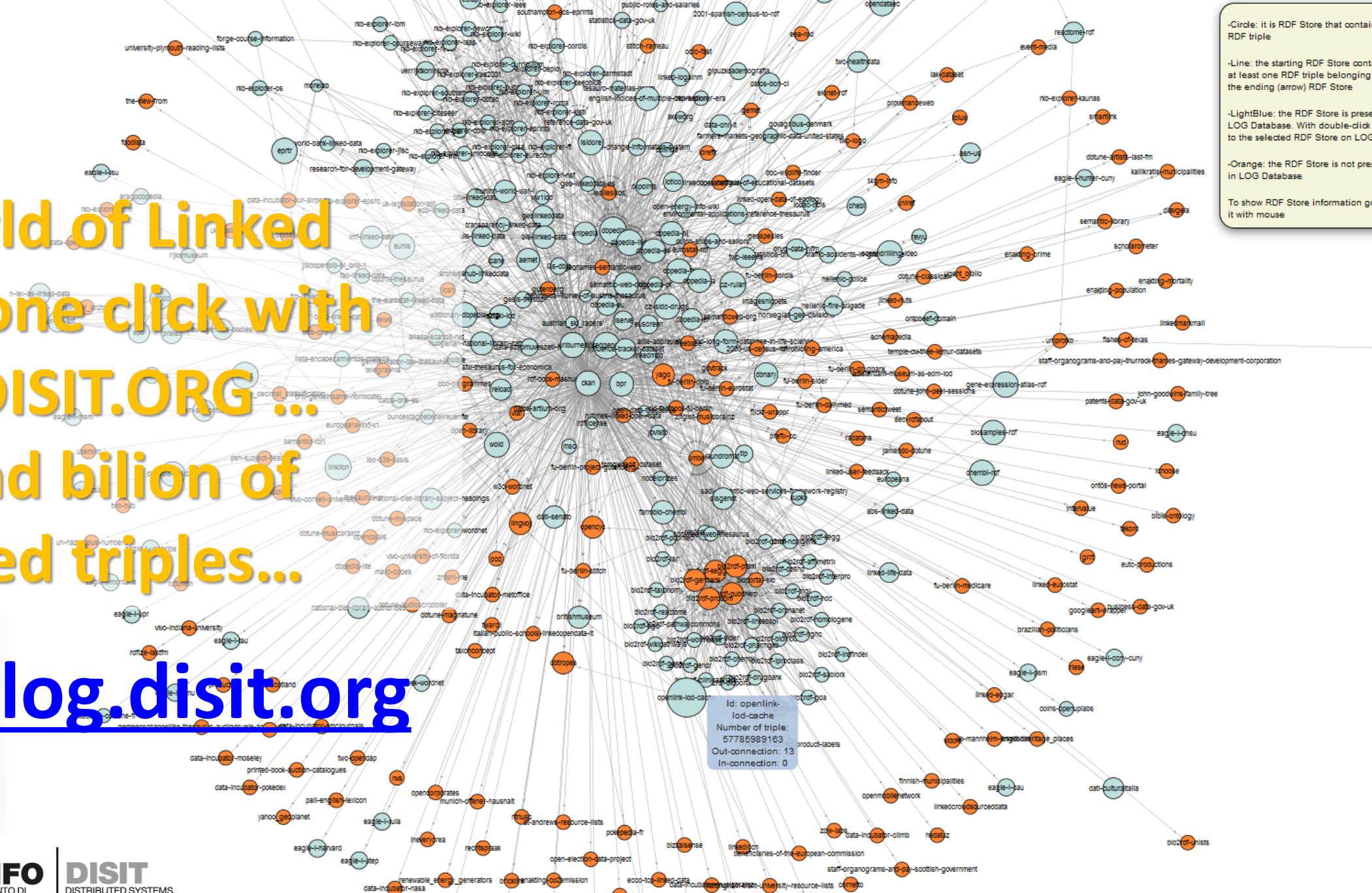
<http://www.disit.org/5606>

<http://www.disit.org/6461>



The World of Linked Data in one click with LOG of DISIT.ORG ... billion and billion of connected triples...

<http://log.disit.org>



-Circle: it is RDF Store that contains RDF triple

-Line: the starting RDF Store contains at least one RDF triple belonging to the ending (arrow) RDF Store

-LightBlue: the RDF Store is present in LOG Database. With double-click goes to the selected RDF Store on LOG

-Orange: the RDF Store is not present in LOG Database

To show RDF Store information go on it with mouse

Id: openlink-lod-cache
 Number of triple: 57785989163
 Out-connection: 13
 In-connection: 0



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**Present data on
Tuscany Region
June 2017**

Road Graph (Tuscany region)

132,923 Roads
389,711 Road Elements
318,160 Road Nodes
1,508,207 Street Numbers

Info on: points, paths, areas, etc.

Services (20 cat, 512 cat.)

16 Pub. Transport Operators

21.280 Bus stops & 1081 bus lines

Dynamic/real-time in Tuscany Region

- Real time bus lines: 144 updates X day X line
- 1081 Pub Lines: 1-2 updates per day, time and path
- **+210** parking status: 76 updates X day X sensor
- 796 traffic Sensors: 288 updates X day X sensor
- 285 weather area: 2 updates X day X area
- **+12** hospital Triage status: 96 updates X day X FA
- 1600 Fuel stations: 1 update X day X station
- 22 Environmental data: 20 updates X day X sensor
- **New: Bike Sharing data**
- **New: Pollination data**
- Florence ent.events: about 60 new events X day
- **New: Florence traffic events,**
- Wi-Fi: > 400.000 measures X day
- App mobiles: > 50.000 measures X day
- more than 40.000 distinct users X day
- From 600.000 to 4.5 M Tweets X day
- many IOT

Fermate Firenze Comuni in Toscana Ricerca Testuale

Seleziona una provincia:

FIRENZE

Seleziona un comune:

FIRENZE

Actual Selection

COMUNE di FIRENZE

KM4 CITY

Giovedì

Venerdì

Sabato

poco nuvoloso
23°C / 27°C

poco nuvoloso
20°C / 33°C

poco nuvoloso

velato

schiarite
20°C / 20°C

schiarite
20°C / 20°C

Other Sensors and Actuators, IOT

- Restricted Traffic Zone Gates
 - Passages, payment, alerts,
 - Wi-Fi control, RFI control, etc.
- Road Direction manager: panel, red-light, etc.
 - Status and action
- **Environmental Sensors:**
 - Air quality, pollution, rain, allergens, temperature,
 - humidity,...
- Public Light Pillar
 - Traffic flows, environment,
 - Wi-Fi, Tv-Camera, BT servers, on/off, percentage of light, ..
- Waste Manager
 - Level, kind, status, on/off
- Recharge station, column
 - Free slots, consumption, next time slot, ...



- **Environmental Sensors:**
 - Air, temperature, humidity,
 - water level in rivers
 - Status of underpass and bridges
- **Risk assessment**
 - Value of the buildings,
 - hydrogeological risk map,
 - earthquake risk map, ...
 - people distribution and location
 - Position of recover places,
- **Traffic Zone Gates**
 - Passages, alerts,
 - etc.





- **Statici:**

- Struttura del grafo strade: regionale integrato a OSM
- POI, Musei, etc...: 500 categorie, 200 macro-categorie
- Varie categorie.

- **Real Time**

- Parcheggi coperti come numeri di posti liberi
- Triage ospedali
- Posizione distributori e prezzi della benzina
- Percorsi ed orari aggiornati CTTnord: operatori + FFSS + tranvia + ferri, percorsi, paline ed orari: afat, ctt, cap, tiemme, amvbus, tft, vaibus, blubus, etruria mobilità, siena mobilità, cpt, trenitalia, gest, toremar.
- Orari ferrovie regionali, traghetti
- Twitter monitoring, sentiment analytis
- Previsioni meteo
- Ambientali e pollinazione
- **Bike Sharing in Pisa**

- **Algoritmi:**

- Routing in toscana
- Predizioni parcheggi in Toscana
- Predizioni presenze via Wi-Fi

ServiceMap



Search around a GPS point

Search along a line

Regular Services | Transversal Services
search text into service
Services Categories
De/Select All
Area
DigitalLocation
HappeningNow
Path
Fresh Place
Public Transport Line
Road Sensors
Bus Stops
N. results for each: 200
Search Range: 500 mt

Search Results
Services: 35 of 35 available
Bus Stops: 13 of 13 available
Road Sensors: 2 of 2 available

Bus Lines
72 Bus Lines Found.

Bus Line: 23
Direction: NAVE A ROVEZZANO → NUOVO PIGNONE

Bus Line: 23
Direction: SORDANE → NUOVO PIGNONE

Bus Line: 35
Direction: MAGERITA → STAZIONE VIA ALAMANI

Weather Forecast for Municipality of: FIRENZE
Sunday: light rain and sunny intervals 18°C / 24°C
Monday: cloudy 13°C / 24°C
Tuesday: cloudy 13°C / 25°C
Wednesday: light rain
Thursday: rainstorm

Search for Geo Located Services

Get Events in the city

Regular Services | Transversal Services
search text into service
Services Categories
De/Select All
Area
DigitalLocation
HappeningNow
Path
Fresh Place
Public Transport Line
Road Sensors
Bus Stops
N. results for each: 500
Search Range: 500 mt

Search Results
Services: 418 of 418 available
Bus Stops: 23 of 23 available
Road Sensors: 2 of 2 available

Bus Lines
33 Bus Lines Found.

Bus Line: C2
Direction: PIAZZA BECCARIA → LEOPOLDA

Bus Line: C2
Direction: PIAZZA BECCARIA → LEOPOLDA

Bus Line: 12
Direction: STAZIONE PARCHEGGIO → PIAZZALE SERVIZIO AREA 19

Weather Forecast for Municipality of: FIRENZE
Sunday: light rain and sunny intervals 18°C / 24°C
Monday: cloudy 13°C / 24°C
Tuesday: cloudy 13°C / 25°C
Wednesday: light rain
Thursday: rainstorm

Search in an area

Regular Services | Transversal Services
search text into service
Services Categories
De/Select All
Accommodation
Advertising
AgricultureAndLivestock
CivilAndITEngineering
CulturalActivity
EducationAndResearch
Emergency
Entertainment
Environment
FinancialService
GovernmentOffice
HealthCare
IndustryAndManufacturing
MiningAndQuarrying
ShippingAndService
TourismService
TransferServiceAndRenting
UtilitiesAndSupply
Wholesale
WineAndFood
N. results: No Limit
Search Range: visible areas

Search Results
Services: 2231 of 2231 available

Query results organized by category
Total number of results: 2231

Weather Forecast for Municipality of: FIRENZE
Sunday: light rain and sunny intervals 18°C / 24°C
Monday: cloudy 13°C / 24°C
Tuesday: cloudy 13°C / 25°C
Wednesday: light rain
Thursday: rainstorm

Get weather forecast

Get Real Time data (public busses, car parks, sensors, traffic flows)

Regular Services | Transversal Services
search text into service
Services Categories
De/Select All
Area
DigitalLocation
HappeningNow
Path
Fresh Place
Public Transport Line
Road Sensors
Bus Stops
N. results for each: 200
Search Range: 500 mt

Search Results
Bus Stops: 25 of 25 available
Road Sensors: 3 of 3 available

Actual Selection
Service: F1055ZTL01601

F1055ZTL01601
LINKED OPEN GRAPH
Topology: TransferServiceAndRenting - SensorSite
Address: VIA GUELFIA
Data from sensor: F1055ZTL01601
Last Update: 2016-06-01 13:31:30+02:00

| Avg Distance(m) | Avg Time (sec) | Occupancy (%) | Concentration (car/km) |
|-----------------|----------------|---------------|------------------------|
| N.A. | N.A. | N.A. | 0.0 |

| Vehicle Flow (car/h) | Avg Speed (km/h) | Threshold Perc (%) | Speed Perc (%) |
|----------------------|------------------|--------------------|----------------|
| 48.0 | 0.0 | N.A. | N.A. |

Weather Forecast for Municipality of: FIRENZE
Sunday: light rain and sunny intervals 18°C / 24°C
Monday: cloudy 13°C / 24°C
Tuesday: cloudy 13°C / 25°C
Wednesday: light rain
Thursday: rainstorm

Cycling Paths



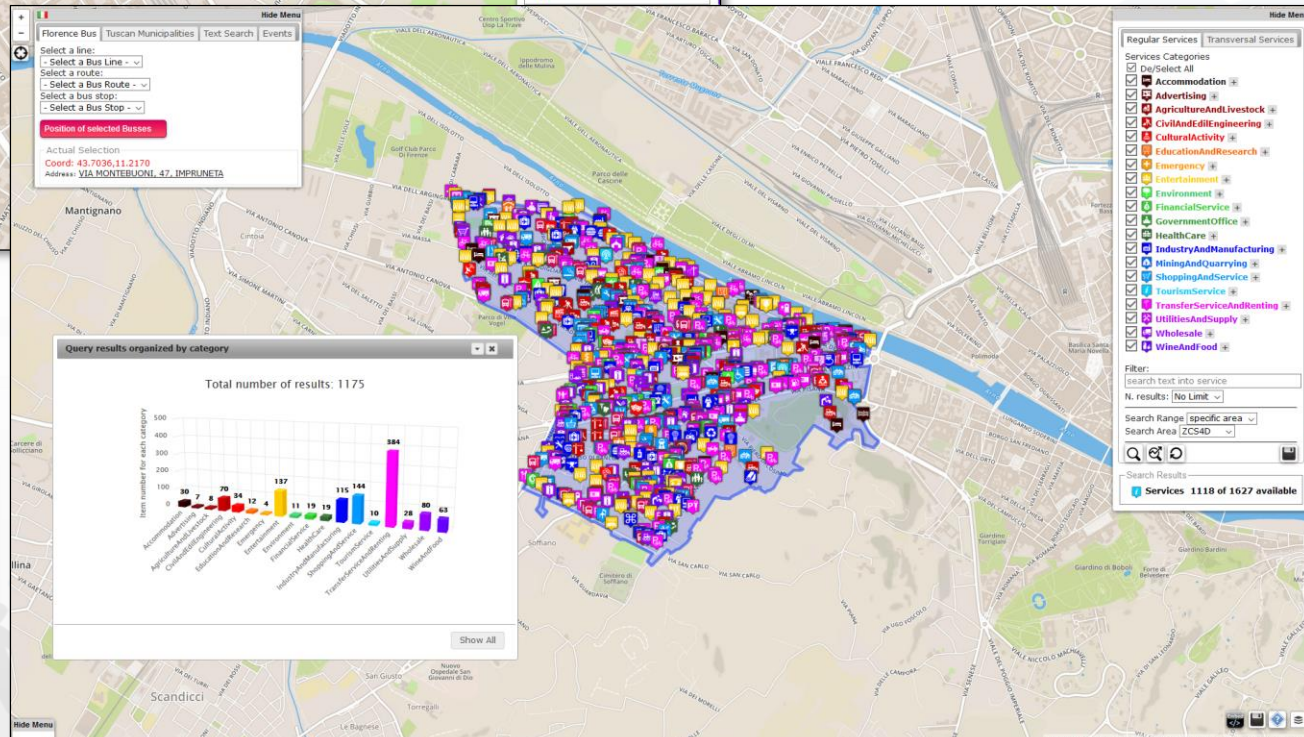
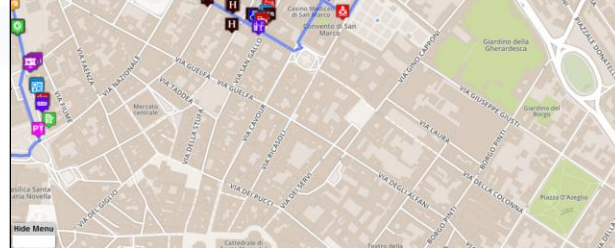
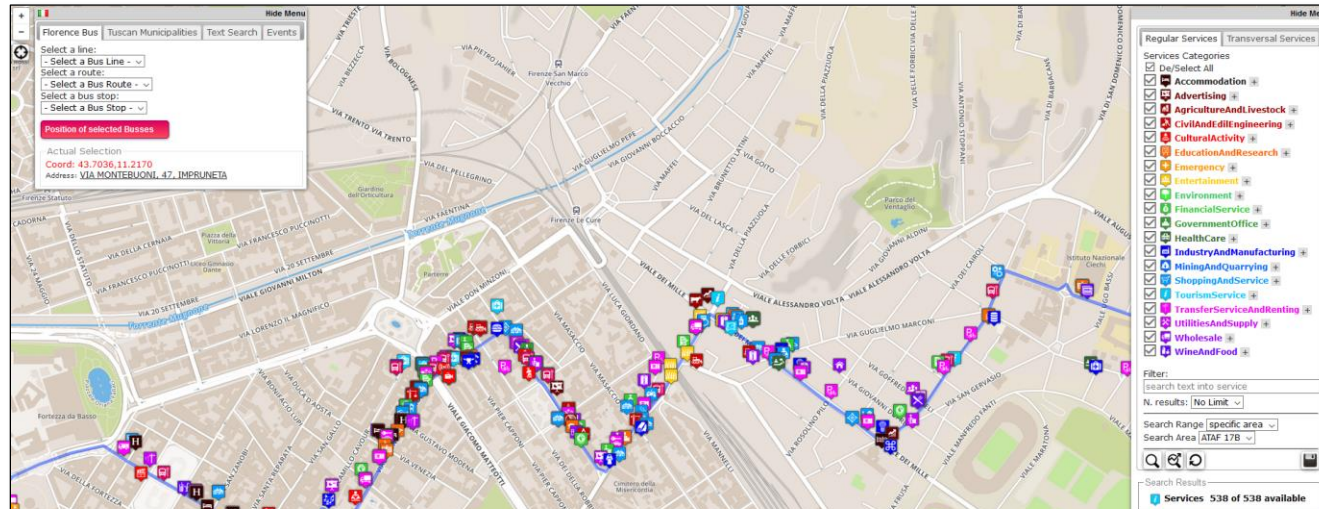
Actual Selection
Coord: 43.7803,11.2548
Address: PIAZZA DELL'INDIPENDENZA, 26, FIRENZE
Route: 12 (dist:0,0001)
Route: 81 (dist:0,0001)

Search Results
Services 228 of 228 available

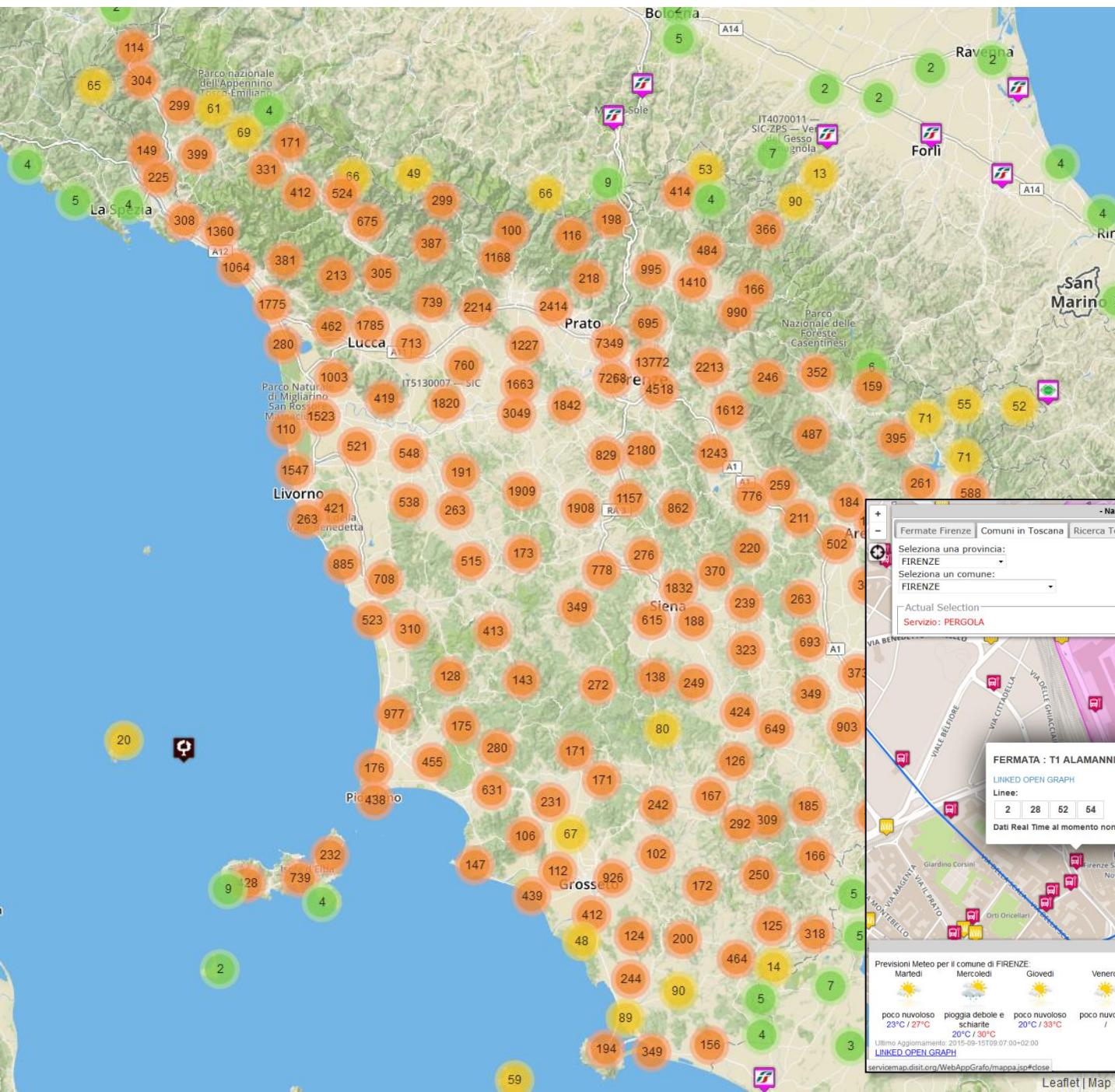
| Result | Type | Distance |
|------------------------------|------------|----------|
| Percorsi Ciclabili.309 | Ciclocorsi | 172 m |
| Percorsi Ciclabili.305 | Ciclocorsi | 191 m |
| Arena Esterno Notte Poggetto | Cinema | 351 m |
| Auditorium Fleg | Teatro | 351 m |



Along a Line



Into an Area



- Nascondi Menu

Fermate Firenze | Comuni in Toscana | Ricerca Testuale

Seleziona una provincia:
FIRENZE

Seleziona un comune:
FIRENZE

Actual Selection
Servizio: PERGOLA

Giardino di piazza dell'Indipendenza

LINKED OPEN GRAPH
Tipologia: Entertainment - Green_areas
Digital Location
Indirizzo: PIAZZA DELLA INDIPENDENZA, 15
Cap: 50129
City: FIRENZE
Prov: FI
Note: areeverd238

Rimuovi dalla Mappa

FERMATA : T1 ALAMANNI

LINKED OPEN GRAPH
Linee:
2 28 52 54

Dati Real Time al momento non disponibili

FERMATA : PERGOLA

LINKED OPEN GRAPH
Linee:
14 19 23 31 6

Route:
Linea Percorso
6 A NOVELLI → OSPEDALE TORRE GALLI
6 B NOVELLI → OSPEDALE TORRE GALLI
6 A OSPEDALE TORRE GALLI → NOVELLI
6 B OSPEDALE TORRE GALLI → NOVELLI

Dati Real Time al momento non disponibili

Previsioni Meteo per il comune di FIRENZE:

| Martedì | Mercoledì | Giovedì | Venerdì | Sabato |
|------------------------------|--|------------------------------|--------------------|-------------|
| | | | | |
| poco nuvoloso 23°C / 27°C | pioggia debole e schiarite 20°C / 30°C | poco nuvoloso 20°C / 33°C | poco nuvoloso / | velato / |

Ultimo Aggiornamento: 2015-06-10T09:07:00-02:00
LINKED OPEN GRAPH
servicemap.digit.org/WebAppGrafo/mappa.jsp#close

Servizi Regolari | Servizi Trasversali

search text into service

Categorie Servizi
 De/Select All

- Digital Location
 - Consuete
 - Controlled_parking_zone
 - cycle_paths
 - Gardens
 - Green_areas
 - Historical_buildings
 - Library
 - Literary_cafe
 - Local_health_authority
 - Monument_location
 - Museum
- Fresh Place
- Road Sensors
- Bus Stops

N. risultati for each: Nessun Limite

Raggio ricerca area visibile

Resultati della ricerca

Bus Stops: 21 - Linea Bus: 25
Direction: LA PIRA → PIAN DI SAN BARTOLO

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox



Hide Menu

Florence Bus Tuscan Municipalities Text Search Events

Select a province:
PISA

Select a municipality:
PISA

Actual Selection
COMUNE di PISA

Hide Menu

Regular Services Transversal Services

Services Categories

- De/Select All
- Accommodation +
- Advertising +
- AgricultureAndLivestock +
- CivilAndEdilEngineering +
- CulturalActivity +
- EducationAndResearch +
- Emergency +
- Entertainment +
- Environment +
- FinancialService +
- GovernmentOffice +
- HealthCare +
- IndustryAndManufacturing +
- MiningAndQuarrying +
- ShoppingAndService +
- TourismService +
- TransferServiceAndRenting +
- UtilitiesAndSupply +
- Wholesale +
- WineAndFood +

Filter:
search text into service

N. results: No Limit

Search Range 100 mt

Search Area select...

Search Results
Services 1058

Query results organized by category

Total number of results: 1058

| Category | Item number |
|---------------------------|-------------|
| Accommodation | 529 |
| CulturalActivity | 71 |
| Emergency | 57 |
| Entertainment | 9 |
| FinancialService | 25 |
| GovernmentOffice | 18 |
| HealthCare | 13 |
| ShoppingAndService | 46 |
| TourismService | 54 |
| TransferServiceAndRenting | 9 |
| WineAndFood | 41 |
| Wholesale | 186 |

[Show All](#)

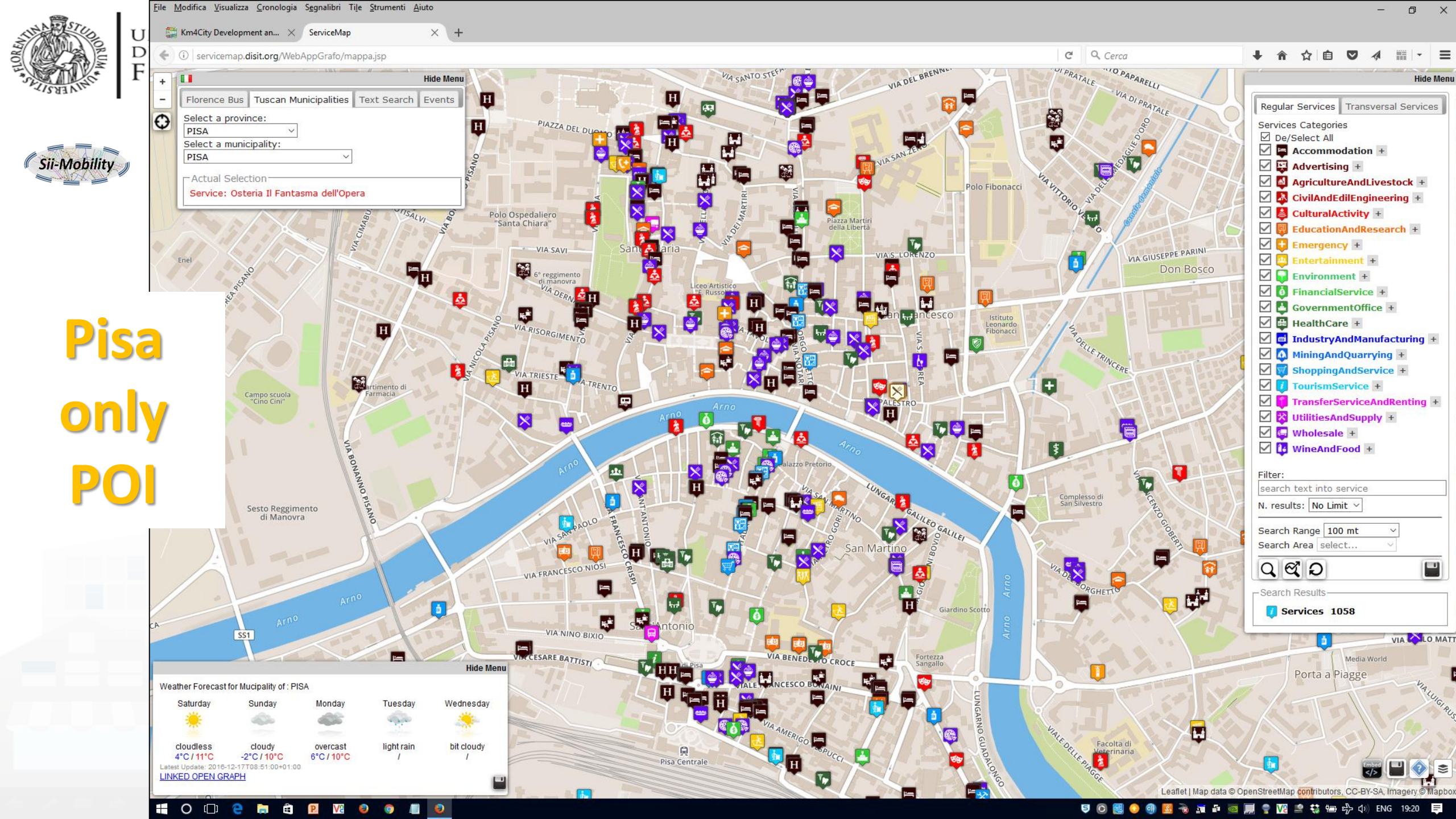
Hide Menu

Weather Forecast for Municipality of : PISA

| Day | Weather | Temperature |
|-----------|------------|-------------|
| Saturday | cloudless | 4°C / 11°C |
| Sunday | cloudy | -2°C / 10°C |
| Monday | overcast | 6°C / 10°C |
| Tuesday | light rain | / |
| Wednesday | bit cloudy | / |

Latest Update: 2016-12-17T10:51:00+01:00
[LINKED OPEN GRAPH](#)

Esempio: Su area Pisa



UDF



Pisa only POI

File Modifica Visualizza Segnalibri Tije Strumenti Aiuto

Km4City Development an... ServiceMap

servicemap.disit.org/WebAppGrafo/mappa.jsp

Hide Menu

Florence Bus Tuscan Municipalities Text Search Events

Select a province:
PISA

Select a municipality:
PISA

Actual Selection
Service: Osteria Il Fantasma dell'Opera

Map showing various POI icons (Accommodation, Advertising, Agriculture, etc.) overlaid on a street map of Pisa. The Arno river is visible in the center.

Regular Services Transversal Services

Services Categories

- De/Select All
- Accommodation +
- Advertising +
- AgricultureAndLivestock +
- CivilAndEdilEngineering +
- CulturalActivity +
- EducationAndResearch +
- Emergency +
- Entertainment +
- Environment +
- FinancialService +
- GovernmentOffice +
- HealthCare +
- IndustryAndManufacturing +
- MiningAndQuarrying +
- ShoppingAndService +
- TourismService +
- TransferServiceAndRenting +
- UtilitiesAndSupply +
- Wholesale +
- WineAndFood +

Filter:
search text into service

N. results: No Limit

Search Range 100 mt

Search Area select...

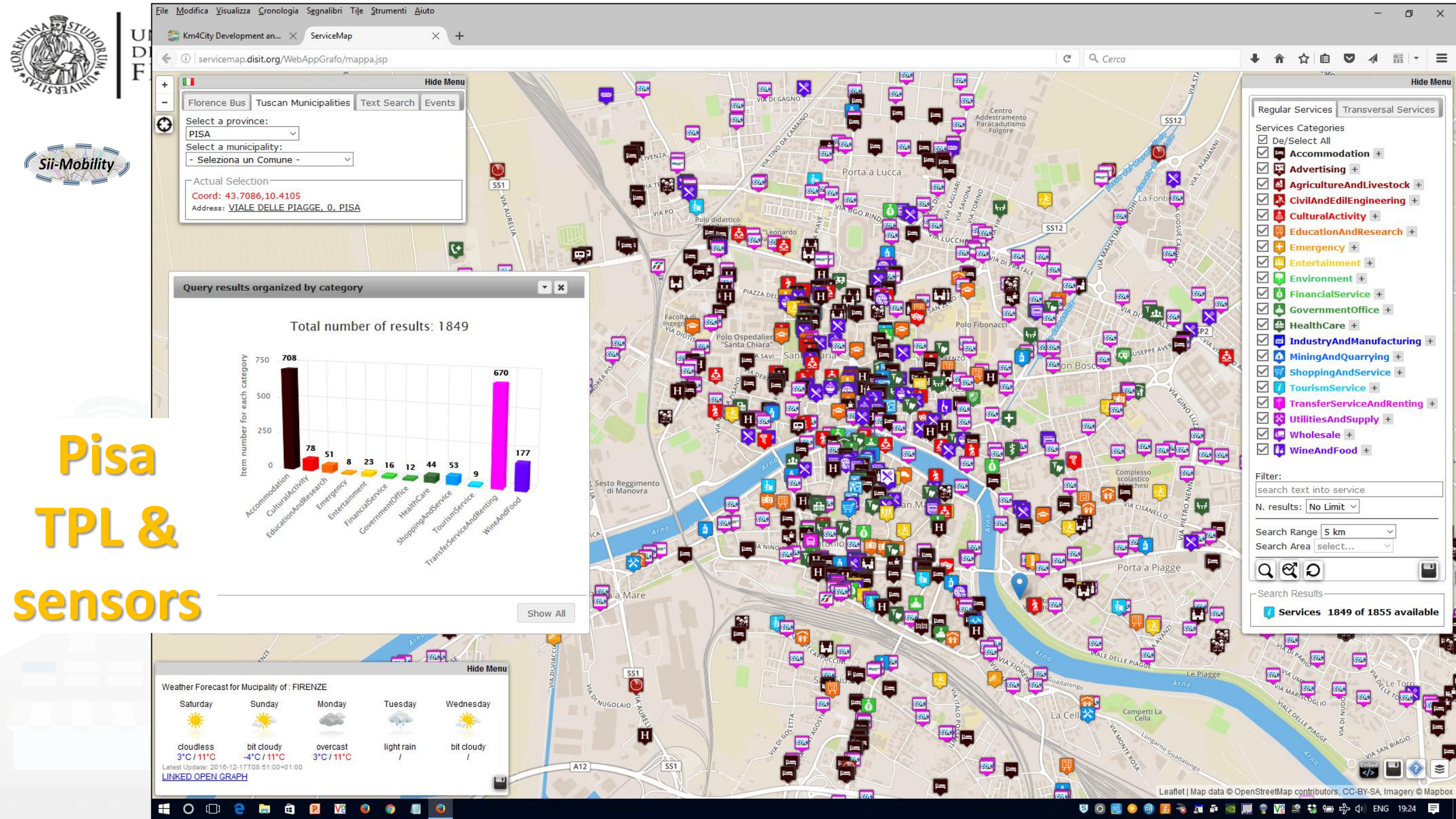
Search Results

Services 1058

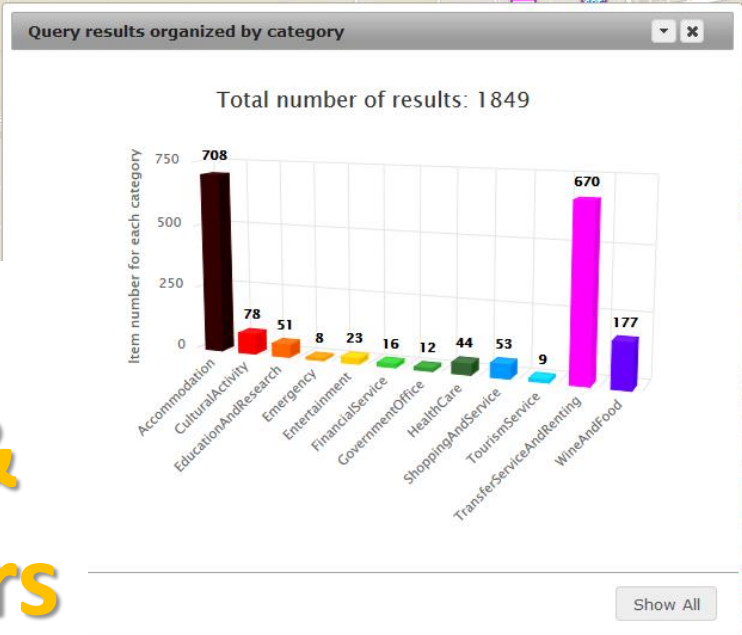
Weather Forecast for Municipality of : PISA

| Saturday | Sunday | Monday | Tuesday | Wednesday |
|-------------------------|-----------------------|------------------------|-----------------|-----------------|
| | | | | |
| cloudless 4°C / 11°C | cloudy -2°C / 10°C | overcast 6°C / 10°C | light rain / | bit cloudy / |

Latest Update: 2016-12-17T08:51:00+01:00
[LINKED OPEN GRAPH](#)



Pisa TPL & sensors



Weather Forecast for Municipality of: FIRENZE

| Day | Weather | Temperature |
|-----------|------------|-------------|
| Saturday | cloudless | 3°C / 11°C |
| Sunday | bit cloudy | -4°C / 11°C |
| Monday | overcast | 3°C / 11°C |
| Tuesday | light rain | / |
| Wednesday | bit cloudy | / |

Latest Update: 2016-12-17T08:51:00+01:00
[LINKED OPEN GRAPH](#)

Regular Services | Transversal Services

Services Categories

- De/Select All
- Accommodation +
- Advertising +
- AgricultureAndLivestock +
- CivilAndEdilEngineering +
- CulturalActivity +
- EducationAndResearch +
- Emergency +
- Entertainment +
- Environment +
- FinancialService +
- GovernmentOffice +
- HealthCare +
- IndustryAndManufacturing +
- MiningAndQuarrying +
- ShoppingAndService +
- TourismService +
- TransferServiceAndRenting +
- UtilitiesAndSupply +
- Wholesale +
- WineAndFood +

Filter:

search text into service

N. results: No Limit

Search Range: 5 km

Search Area: select...

Search Results

Services 1849 of 1855 available



Esempio: Su Pisa solo TPL e sensori

ServiceMap interface showing a map of Pisa with public transport lines and sensors. The interface includes a search bar, a sidebar with filters, and a main map area with a data table overlay.

LINKED OPEN GRAPH

Lines: E03 E03

Display 10 Bus per page

| Time | Line | Direction |
|---------------------|------|----------------|
| 18:51:00 2016-12-17 | E03 | Piazzale Verdi |
| 19:21:00 2016-12-17 | E03 | Piazzale Verdi |
| 20:38:00 2016-12-17 | E03 | Piazzale Verdi |
| 09:21:00 2016-12-18 | E03 | Piazzale Verdi |
| 11:21:00 2016-12-18 | E03 | Piazzale Verdi |

Showing page 1 of 1

Real-time data currently not available

REGULAR SERVICES | Transversal Services

Services Categories

- De/Select All
- Area +
- DigitalLocation +
- HappeningNow +
- Path +
- Fresh Place
- Public Transport Line
- Road Sensors
- Bus Stops
- Tram_stops
- Train_station
- Ferry_stop

Filter:

search text into service

N. results for each: No Limit

Search Range: visible areas

Search Results:

- Services 7 of 7 available
- Bus Stops: 1456 of 1456 available
- Road Sensors: 68 of 68 available

Bus Lines

568 Public Transport Lines Found.

TPL Line:
Direction: Castellina → Collesalveti P.Zza Gramsci

TPL Line:
Direction: Collesalveti Centro → V. Cogorano D

TPL Line:
Direction: Collesalveti Centro → V. Cogorano D

METRO74

LINKED OPEN GRAPH

Typology: TransferServiceAndRenting - SensorSite

Address: SGC FI-PI-LI - Navaochio - Pisa NE (IT13) - dir.FI

Data from sensor: METRO74

Latest Update: 2016-12-17T18:30:00+01:00

| Avg Distance(m) | Avg Time (sec) | Occupancy (%) | Concentration (car/km) |
|----------------------|------------------|--------------------|------------------------|
| N.A. | 31.28727 | N.A. | 0.0 |
| Vehicle Flow (car/h) | Avg Speed (Km/h) | Threshold Perc (%) | Speed Perc (%) |
| 0.0 | 110.0 | N.A. | N.A. |



File Modifica Visualizza Cronologia Segnalibri Tile Strumenti Aiuto

Km4City Development an... ServiceMap

servicemap.disit.org/WebAppGrafo/mappa.jsp

Cerca

Hide Menu

Florence Bus Tuscan Municipalities Text Search Events

Select an agency:
- Select an Agency -

Select a line:
- Select a Line -

Select a route:
- Select a Route -

Select a bus stop:
- Select a Bus Stop -

Position of selected Busses

Actual Selection
Bus Stop: Via Brennero Km 4,4 La Figuretta

Regular Services Transversal Services

Services Categories

- De/Select All
- Area +
- DigitalLocation +
- HappeningNow +
- Path +
- Fresh Place
- Public Transport Line
- Road Sensors
- Bus Stops
- Tram_stops
- Train_station
- Ferry_stop

Filter:
search text into service

N. results for each: No Limit

Search Range visible areas

Search Results

- Services 7 of 7 available
- Bus Stops: 1456 of 1456 available
- Road Sensors: 68 of 68 available

Bus Lines

568 Public Transport Lines Found.

TPL Line:
Direction: Castellina → Collesalveti P.Zza Gramsci

TPL Line:
Direction: Collesalveti Centro → V. Cogorano D

TPL Line:
Direction: Collesalveti Centro → V. Cogorano D

Leatleaf | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

ENG 19:16

Esempio: Su Pisa solo TPL e sensori



Distributori di benzina in Toscana, prezzi e servizi, giornaliero

ServiceMap | www.disit.org/ServiceMap/

Hide Menu

Florence Bus | Tuscan Municipalities | Text Search | Events

Select an agency:
- Select an Agency -

Select a line:
- Select a Line -

Select a route:
- Select a Route -

Select a bus stop:
- Select a Stop -

Position of selected Busses

Actual Selection
Service: CORTONA-SS71 KM110 330 FR TERONTOLA

CORTONA-SS71 KM110 330 FR TERONTOLA

LINKED OPEN GRAPH

Typology: TransferServiceAndRenting - Fuel_station
Address: FZ.TERONTOLA SS., 71 KM.110.330
Cap: 52040
City: CORTONA
Prov.: AR

| tipo | prezzo | servizio |
|--------------|-----------|----------|
| Benzina | 1.548 EUR | Self |
| GPL | 0.599 EUR | Servito |
| Gasolio | 1.398 EUR | Self |
| Hi-Q Diesel | 1.648 EUR | Self |
| HiQ Perform+ | 1.798 EUR | Self |

Latest Update: 2017-01-06 07:03:59

Regular Services | Transversal Services

Services Categories

- De/Select All
- Accommodation +
- Advertising +
- AgricultureAndLivestock +
- CivilAndEdilEngineering +
- CulturalActivity +
- EducationAndResearch +
- Emergency +
- Entertainment +
- Environment +
- FinancialService +
- GovernmentOffice +
- HealthCare +
- IndustryAndManufacturing +
- MiningAndQuarrying +
- ShoppingAndService +
- TourismService +
- TransferServiceAndRenting -
- Ferry_stop
- Flight_companies
- Freight_transport_and_furniture_remo
- Fuel_station
- Helipads
- Land_transport
- Land_transport_rental
- Lifting_and_handling_equipment_rent
- UtilitiesAndSupply +
- Wholesale +
- WineAndFood +

Filter:
search text into service

N. results: No Limit

Search Range: visible area
Search Area: select...

Search Results
Services 1674 of 1674 available

www.disit.org/ServiceMap/#close

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox



Triage, pronto soccorso in Toscana, stato in tempo reale

ServiceMap www.disit.org/ServiceMap/

Florence Bus Tuscan Municipalities Text Search Events

Select an agency:
- Select an Agency -
Select a line:
- Select a Line -
Select a route:
- Select a Route -
Select a bus stop:
- Select a Stop -

Position of selected Busses

Actual Selection
Service: PRONTO SOCCORSO OSPEDALE DI BORGO SAN LORENZO

PRONTO SOCCORSO AZIENDA OSPEDALIERA PISANA

LINKED OPEN GRAPH
 Tipology: Emergency - First_aid
 Phone: 050992300
 Fax: 050992300
 Address: VIA BONANNO PISANO
 DBpedia: "Nino_Pisano"
 DBpedia: "Pisanello"
 DBpedia: "Giovanni_Pisano"
 DBpedia: "Giovanni_Pisano_(calciatore)"
 DBpedia: "Andrea_Pisano"
 DBpedia: "Andrea_Pisano_(pallanuotista)"
 DBpedia: "Nicola_Pisano"
 Cap: 56100
 City: PISA
 Prov.: PI
 Note: general information: SNC

| stato | rosso | giallo | verde | blu | bianco |
|-----------|-------|--------|-------|-----|--------|
| In Attesa | 0 | 2 | 8 | 5 | 2 |
| In Visita | 1 | 7 | 6 | 1 | 5 |

Latest Update: 2017/01/06 18:30:08.000

PRONTO SOCCORSO OSPEDALE DI BORGO SAN LORENZO

LINKED OPEN GRAPH
 Tipology: Emergency - First_aid
 Phone: 0552496253
 Fax: 0552496253
 Address: VIALE DELLA RESISTENZA, 52
 Cap: 50032
 City: BORGO SAN LORENZO
 Prov.: FI

| stato | rosso | giallo | verde | blu | bianco |
|------------------|-------|--------|-------|-----|--------|
| Con Destinazione | 0 | 1 | 1 | 0 | 0 |
| In Attesa | 0 | 0 | 0 | 0 | 0 |
| In Visita | 0 | 0 | 1 | 0 | 0 |
| Oss. Temporanea | 0 | 0 | 4 | 0 | 0 |
| Totale | 0 | 1 | 6 | 0 | 0 |

Latest Update: 2017-01-12T02:30:00-00:00

Regular Services Transversal Services

Services Categories

- De/Select All
- Accommodation +
- Advertising +
- AgricultureAndLivestock +
- CivilAndEdilEngineering +
- CulturalActivity +
- EducationAndResearch +
- Emergency**
 - Commissariat_of_public_safety
 - Corps_of_forest_rangers
 - Emergency_medical_care
 - Emergency_services
 - Fire_brigade
 - First_aid
 - Italian_finance_police
 - Local_police
 - Towing_and_roadside_assistance
- Entertainment +
- Environment +
- FinancialService +
- GovernmentOffice +
- HealthCare +
- IndustryAndManufacturing +
- MiningAndQuarrying +
- ShoppingAndService +
- TourismService +
- TransferServiceAndRenting +
- UtilitiesAndSupply +
- Wholesale +
- WineAndFood +

Filter:
search text into service
N. results: No Limit
Search Range: visible area
Search Area: select...

Search Results
Services 43 of 43 available

www.disit.org/ServiceMap/#close

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

Smart City Control Room

<http://www.km4city.org/?controlRoom>



Sentient City Control Room





UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB
<http://www.disit.org>



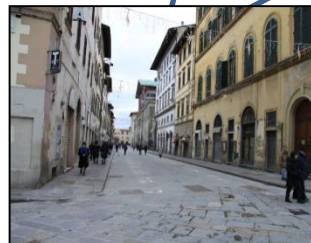
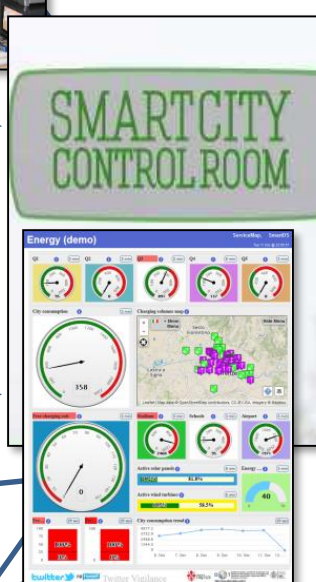
Horizon 2020
European Union Funding
for Research & Innovation



Transport
systems,
Mobility, Parking



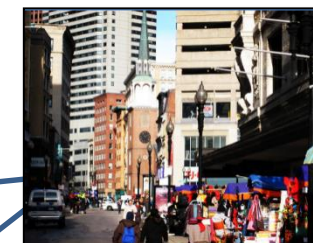
Sensors, IOT
Cameras, ..



Public services,
Govern, Events



Environment,
Water, energy



Shops,
services,
operators



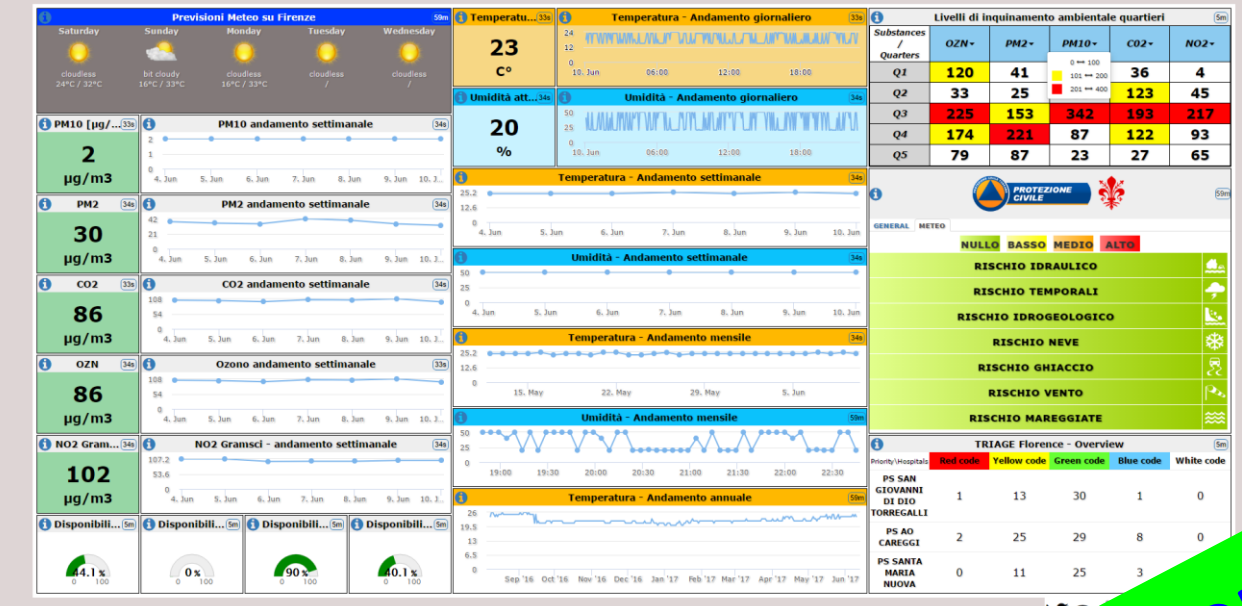
Social Media,
WiFi, Network

Dashboards

Firenze Ambiente e Salute HD

Dati ambientali su Firenze (demo)

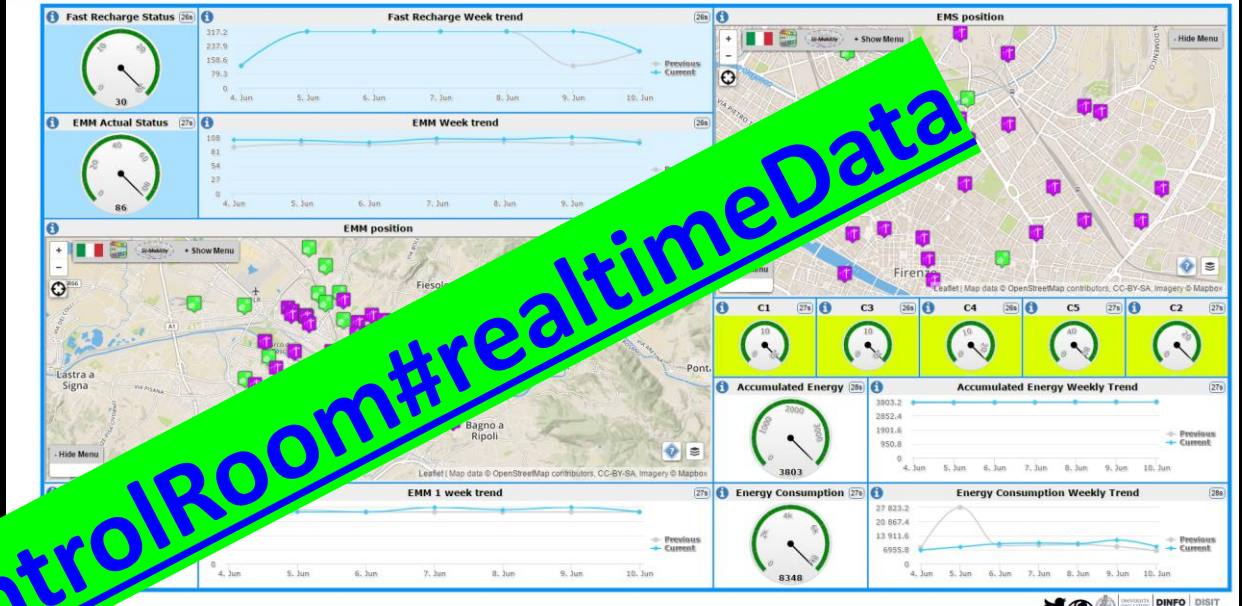
REFUGATE www.refugate.org/it Sat 10 Jun @ 22:49:06



Firenze Energia e Colonnine HD

(demo, dati simulati)

REFUGATE www.refugate.org/it Sat 10 Jun @ 22:48:16



Firenze Sociale e Social Media (HD)

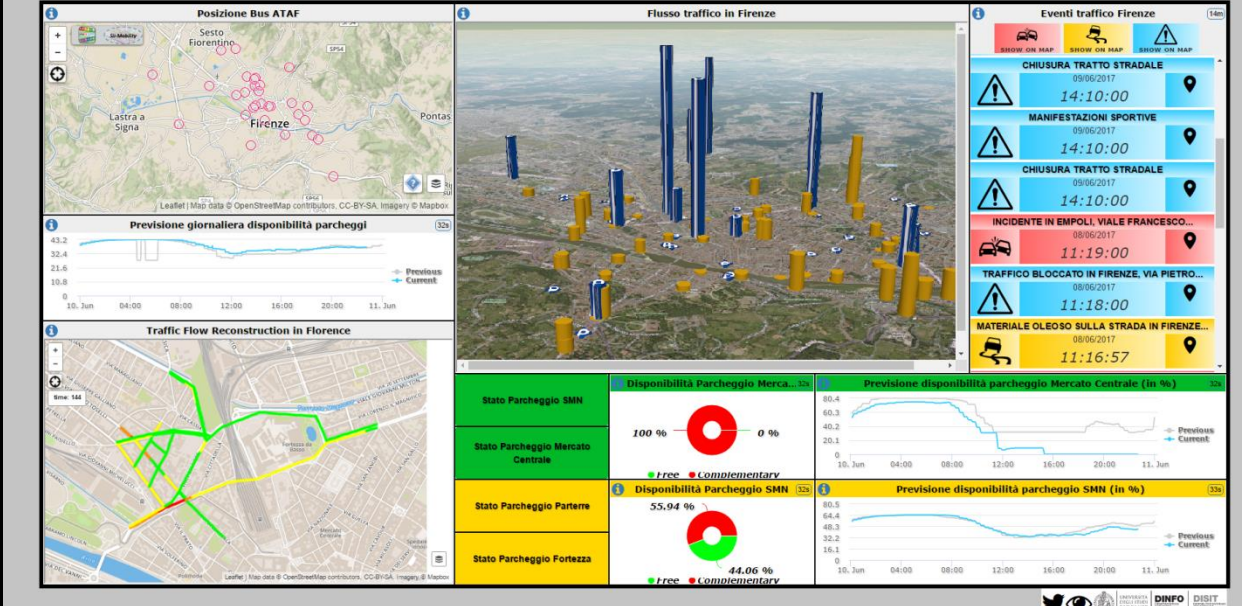
(dati non completi)



Firenze Mobilità e Trasporti HD

(demo, dati non completi)

REFUGATE www.refugate.org/it Sat 10 Jun @ 22:46:34



http://www.km4city.org/?controlRoom#realtimeData

ESB

Alarms

- TEST - ALLUVIONE MUGNONE MAJOR
- ALLUVIONE ARNO COVERCIANO CRITICAL
- ALLUVIONE ARNO VIA PETRIOLO MAJOR
- TEST - SCONTRI ALLO STADIO CRITICAL

Traffic events

- SEVERE ACCIDENT SERIOUS ACCIDENT(S)
- ROAD WORKS ROADWORKS
- ORD 2017-001302 - SP NA*17 A??ALTO VALDARNOA??1ST
- RESTRICTIONS
- INTERVENTO URGENTE PUBBLICACQUA CLOSED AHEAD

Evacuation plans

- PLAN N.1497263867 IN_PROGRESS
- PLAN N.2000000000 PROPOSED
- PLAN N.1497604404 PROPOSED

Tram position

- TRAM1
- TRAM2

Network Analysis

- FM0495 (NORMALIZED) NODE BETWEENNESS: 1.0000
- FM0496 (NORMALIZED) NODE BETWEENNESS: 0.7825
- FM0701 (NORMALIZED) NODE BETWEENNESS: 0.7825

Environment

PROTEZIONE CIVILE

GENERAL METEO

RISCHIO IDRAULICO

RISCHIO TEMPORALI

RISCHIO IDROGEOLOGICO

RISCHIO NEVE

RISCHIO GHIACCIO

RISCHIO VENTO

RISCHIO MAREGGIATE

Pluv. Flore... 24 mm

Hydromete... 20 m.s.z.l.

Hidromete... 24 m.s.z.l.

Hydromete... 24 m.s.z.l.

Mobility

Bus Lines Status

ULTIMO AGGIORNAMENTO: 2016-08-04 23:59:03

Underpass Viale Mariti Aperto

Underpass Viale Talenti closed

Underpass Fortezza Aperto

Parterre Pa... 76.2%

SMN 65.7%

Fortezza Fi... 37.2%

Mercato Ce... 65.4%

Resources

Planned events

1966 - 2016 - LA BELLEZZA SALVATA - PROROGATA FINO AL 2

2016-12-01 to 2017-07-02

VIA CAMILLO CAUVOR 3

2017-02-15 to 2017-06-23

PIAZZA DI SAN LORENZO 9

2017-02-15 to 2017-08-29

PIAZZETTA DI SAN LORENZO 9

Ambulance... 20 num.

Voluntiers 33 num.

Florence main first aids status

| Priority | Red code | Yellow code | Green code | Blue code | White code |
|--------------------------------------|----------|-------------|------------|-----------|------------|
| PS SANTA MARIA NUOVA | 1 | 7 | 14 | 1 | 0 |
| PS SAN GIOVANNI DE' DEI TORREGGIALLI | 2 | 10 | 24 | 2 | |
| PS AD CARREGGI | 10 | 27 | | | |
| PS SANTA MARIA ANNUNZIATA | 2 | | | | |

TRENDS QUOTES

#FIRENZE

#NEWS #FIRENZE

#FIRENZE #FIFIUTI

#UFFIZI

#PONTEVEGGHIO

#BARGELLO

#AEROPORTO #FIRENZE

#DUOMO #FIRENZE

#VIAGGI #FIRENZE

#CRONACA #FIRENZE

@MUSEOFIRENZE

@COMUNEFI

@NAZIONE_FIRENZE

@PROTCIVCOMUNEFI

@UNI_FIRENZE

@NOVEDAFIRENZE

@HUBFIRENZE

@ILSITO

TV-RT Firenze

Twitter Vigilance Real Time Dashboard

Last crawling: 2017-06-21 12:44:30

Channel active from 2016-06-27 to 2017-06-21 12:35:00

Data processed from 08:10:00 to 2017-06-21 12:35:00

NLP SA

Sentiment trends in channel Firenze

Zoom 1H 3H 6H 12H 1D 1W 1M

Most Significant Tweets for Sentiment

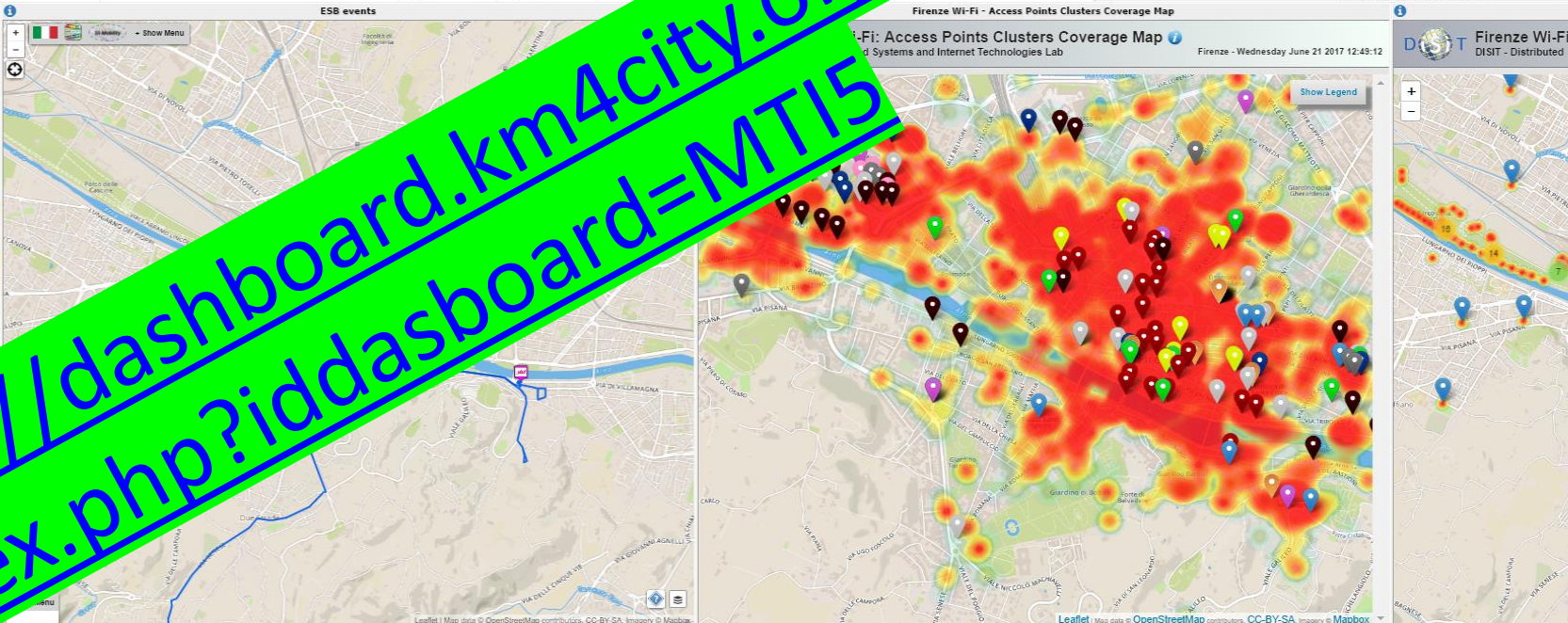
Last tweets per channel Firenze

Firenze Wi-Fi - Access Points Clusters Coverage Map

Firenze - Wednesday June 21 2017 12:49:12

Firenze Wi-Fi - APs Streaming Realtime

Firenze - Wednesday June 21 2017 12:49:12

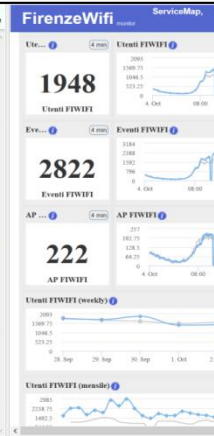
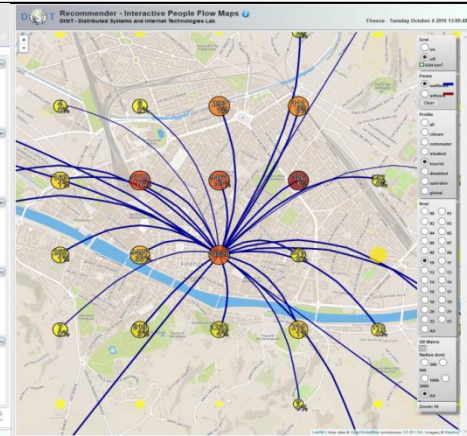
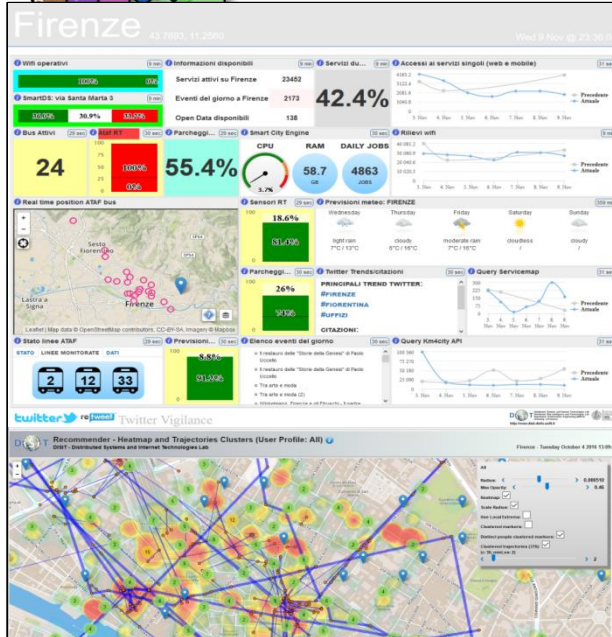


<http://dashboard.km4city.org/dashboard?idashboard=MT15>

Smart City Dashboard



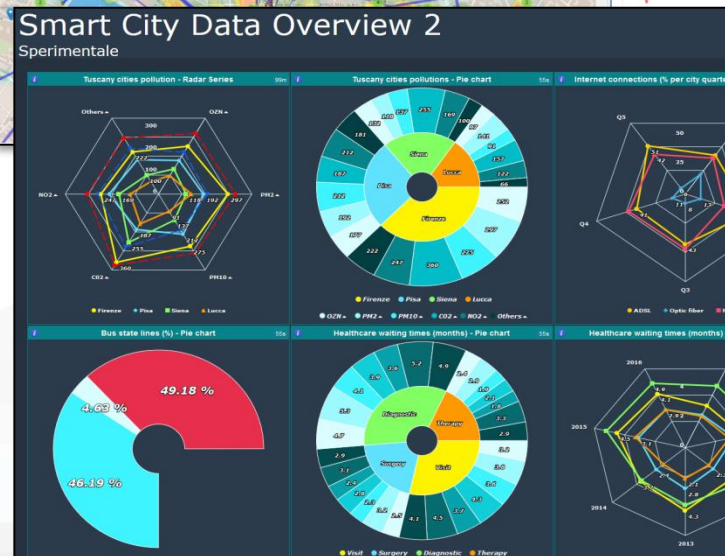
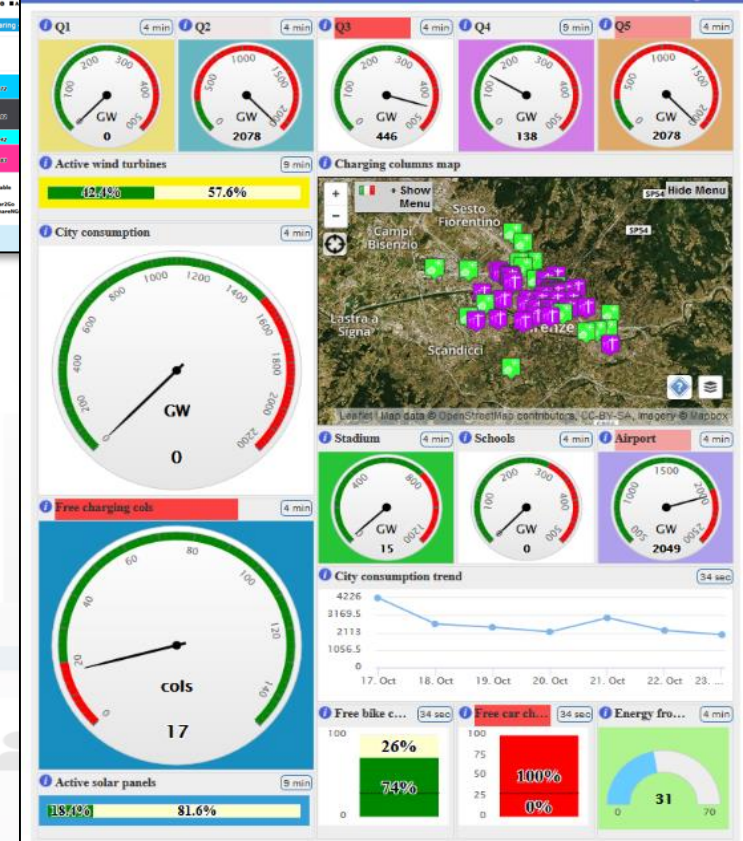
Horizon 2020
European Union Funding
for Research & Innovation



Smart City Data Overview



Energy (demo)



Florence data overview

A table based overview over city main data

Wed 18 Jan @ 19:19:10

| Air Quality Index | | | | | Weather stations | | | | Citizens satisfaction index | | | | | | | | |
|-------------------|------|------|-------|------|------------------|------------------|-------------------|-----------|-----------------------------|--------------|-----------------|-----------------|-------|-------------|----------|-----------------------|------------------------|
| Substances | OZn+ | PM2+ | PM10+ | CO2+ | NO2+ | Stato | Wind speed (km/h) | Direction | Temperature (°C) | Humidity (%) | Rain today (mm) | Pressure (mbar) | Water | Quality (%) | Cost (%) | Availability time (%) | Emergency handling (%) |
| Q1 | 120 | 41 | 105 | 36 | 4 | Sesto Fiorentino | 50 | N | 12 | 0 | 922 | 92 | 67 | 95 | 42 | | |
| Q2 | 33 | 25 | 66 | 123 | 45 | Livorno | 65 | NE | 17 | 0 | 876 | 36 | 29 | 27 | 31 | | |
| Q3 | 225 | 153 | 342 | 193 | 217 | Grosseto | 78 | E | 4 | 22 | 1022 | 77 | 64 | 58 | 62 | | |
| Q4 | 174 | 221 | 87 | 122 | 93 | Varese | 42 | S | 6 | 34 | 895 | 28 | 42 | 27 | 25 | | |
| Q5 | 79 | 87 | 23 | 27 | 65 | Follonica | 102 | N | 7.2 | 23 | 913 | 72 | 61 | 23 | 56 | | |
| | | | | | | Cigliolo | 97 | O | 3 | 19 | 957 | 43 | 54 | 38 | 36 | | |

| Categories | Total arrivals | Overnights | Day trippers | Free | Paid | Winter | Spring | Summer | Autumn |
|------------|----------------|------------|--------------|------|------|--------|--------|--------|--------|
| Airplane | 56 | 36 | 20 | 7 | 23 | 6 | 10 | 4 | 10 |
| Train | 122 | 81 | 41 | 4 | 16 | 3 | 7 | 6 | 4 |
| Car | 215 | 133 | 82 | 60 | 140 | 15 | 100 | 50 | 35 |
| Bus | 157 | 110 | 47 | 0 | 0 | 0 | 0 | 0 | 0 |
| Crabe | 0 | 0 | 0 | 7 | 7 | 2 | 6 | 2 | 4 |
| Boat | 0 | 0 | 0 | 35 | 15 | 10 | 22 | 9 | 9 |
| Total | 550 | 360 | 190 | 30 | 42 | 8 | 25 | 30 | 9 |

| Fields | Free | Paid | Winter | Spring | Summer | Autumn |
|--------------------------------|------|------|--------|--------|--------|--------|
| Classical music, opera, ballet | 7 | 23 | 6 | 10 | 4 | 10 |
| Exhibitions | 4 | 16 | 3 | 7 | 6 | 4 |
| Guided tours | 60 | 140 | 15 | 100 | 50 | 35 |
| Film festival | 0 | 0 | 0 | 0 | 0 | 0 |
| Markets, fairs | 7 | 7 | 2 | 6 | 2 | 4 |
| Readings, conferences | 35 | 15 | 10 | 22 | 9 | 9 |
| Contemporary music | 30 | 42 | 8 | 25 | 30 | 9 |
| Sport | 20 | 192 | 55 | 104 | 27 | 26 |

Cross widget interaction 1

Artistical events, traffic events, city cams



Tu 18:50:21

Artistical and recreative events

PIAZZALE DEGLI UFFIZI 2

LA FABBRICA DELLA BELLEZZA. LA MANIFATTURA GINORI E IL SUO POPOLO DI STATUE

2017-05-18 to 2017-10-01

VIA DEL PROCONSOLO 4

"DANTE INFERNO"

2017-05-22 to 2017-06-30

VIA RICASOLI

UN FRAGILE CAPOLAVORO

2017-05-24 to 2017-09-24

VIA DEGLI ALFANI 78

ESTATE FIORENTINA DEL GIARDINO DELL'ARTECULTURA

Artistical and recreative events - Exhibitions

Unexplored treasures. Florence University Libraries on display

LINKED OPEN GRAPH

Tipology: Event

Artistical and recreative events - Others

| | | | |
|-----------|--------------|--------------|-------------|
| Cam Duomo | Cam Piazzale | Cam Signoria | Cam Trinita |
|-----------|--------------|--------------|-------------|

City webcams - 1

Traffic events

ALL ON MAP

14:21:55

INCIDENTE IN FIRENZE, VIALE EUROPA

06/06/2017

13:43:23

INCIDENTE

06/06/2017

13:38:...

MATERIALE OLE...

06/06/...

13:20:...

INCIDENTE IN FIRENZE, VIA...

06/06/2017

Traffic events

Traffic events - Slippery roads & others

| | | | |
|---------------|-------------|--------------|--------------|
| Cam P.Vecchio | Cam S.Croce | Cam Repubbl. | Cam Fortezza |
|---------------|-------------|--------------|--------------|

City webcams - 2

<http://dashboard.km4city.org/dashboardSmartCity/view/index.php?pidashboard=MT10>

First aids overview - Tuscany

Service status of main first aids

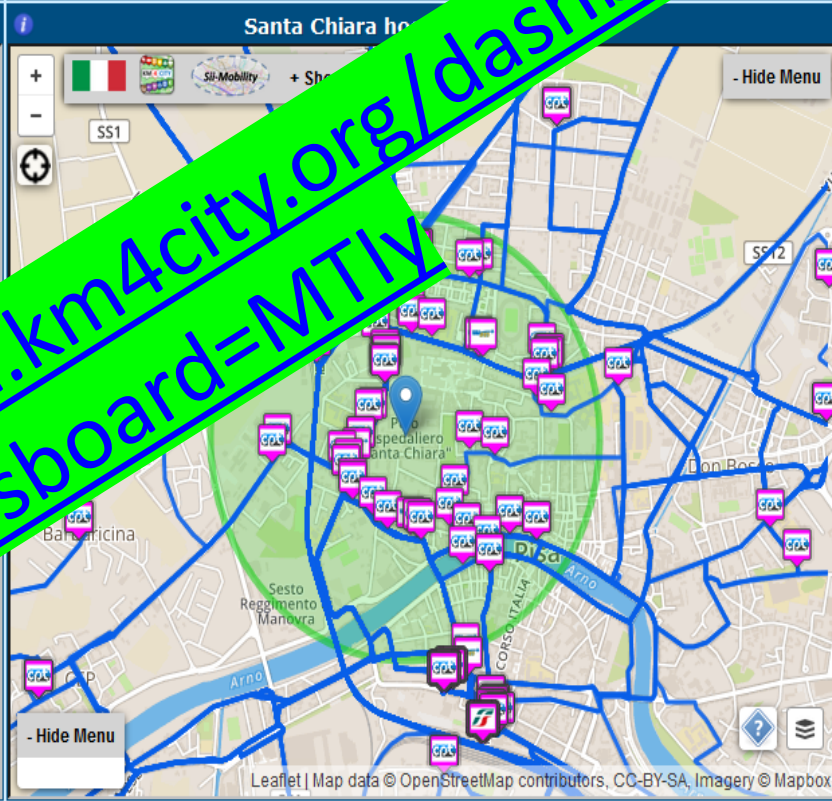
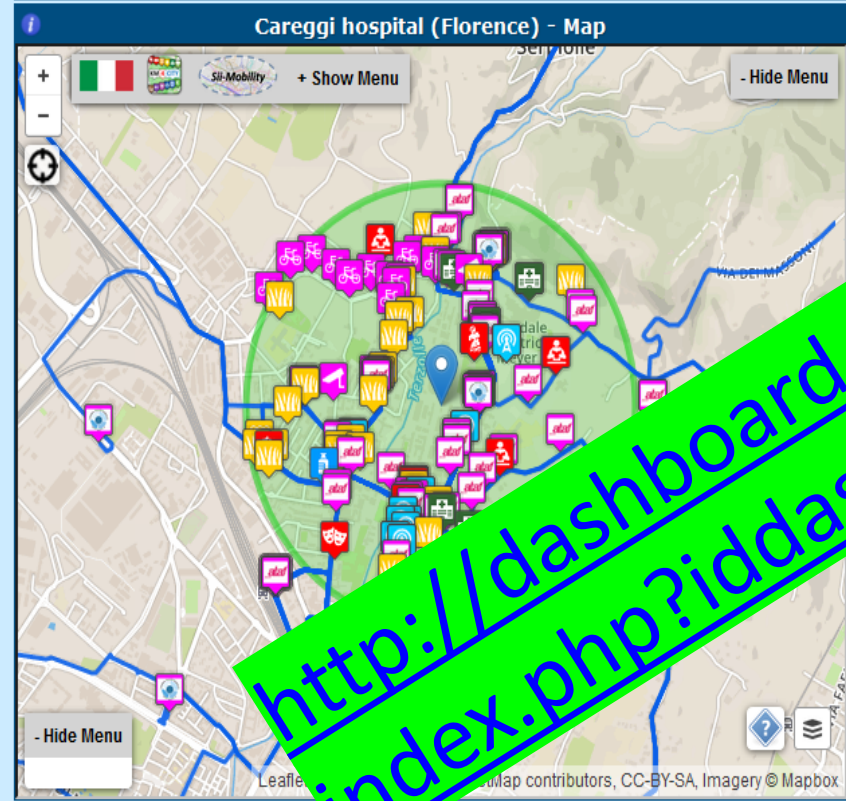


ay @ 11:00:34

| Careggi hospital (Florence) - Details 9m | | | | | |
|---|----------|-------------|------------|-----------|------------|
| Priority\Status | Red code | Yellow code | Green code | Blue code | White code |
| Addressed | 1 | 4 | 3 | 0 | 0 |
| Waiting | 0 | 2 | 9 | 2 | 0 |
| In visit | 1 | 9 | 18 | 3 | 0 |
| In observation | 4 | 19 | 2 | 0 | 0 |
| Totals | 6 | 34 | 32 | 5 | 0 |

| Santa Chiara hospital (Pisa) - Details 9m | | | | | |
|--|----------|-------------|------------|-----------|------------|
| Priority\Status | Red code | Yellow code | Green code | Blue code | White code |
| Waiting | 0 | 1 | 7 | 9 | 3 |
| In visit | 0 | 7 | 1 | 1 | 0 |
| Totals | 0 | 8 | 8 | 9 | 3 |

| Hospitals - Summary 9m | | | | | |
|-------------------------------------|----------|-------------|------------|-----------|------------|
| Priority\Hospital | Red code | Yellow code | Green code | Blue code | White code |
| REGALLI | 1 | 16 | 20 | 1 | 0 |
| PS SANTA MARIA NUOVA | 1 | 14 | 12 | 3 | 0 |
| PS AO CAREGGI | 6 | 34 | 32 | 5 | 0 |
| PS SANTA MARIA ANNUNZIATA | 1 | 8 | 11 | 1 | 0 |
| PS BORGO SAN LORENZO | 0 | 0 | 0 | 0 | 0 |
| PS OSPEDALI RIUNITI | 3 | 0 | 0 | 0 | 1 |
| PS CASENTINO | 0 | 0 | 0 | 0 | 0 |
| PS SANTA CROCE | 0 | 0 | 0 | 0 | 0 |
| PI PO CORTONA | 0 | 0 | 0 | 0 | 0 |
| PS CIVILE PIOMBINO | 0 | 0 | 0 | 0 | 0 |
| PS LA MISERICORDIA | 0 | 0 | 0 | 0 | 0 |



<http://dashboard.km4city.org/dashboardSmartCity/view/index.php?idashboard=MTIY>

Mobile app interface showing service status and map. The app displays a map with service areas and a table of service status data.

| Stato Priorità | 1 | 2 | 3 | 4 | 5 |
|------------------|----------|-----------|-----------|----------|----------|
| Con Destinazione | 0 | 4 | 2 | 0 | 0 |
| In Attesa | 0 | 0 | 1 | 1 | 0 |
| In Visita | 1 | 5 | 4 | 3 | 0 |
| Oss. Temporanea | 1 | 17 | 7 | 1 | 0 |
| Totale | 2 | 26 | 14 | 5 | 0 |



Firenze

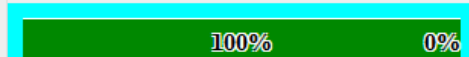
43.7693, 11.2560

Wed 9 Nov @ 23:36:04



Wifi operativi

9 min



SmartDS: via Santa Marta 3

9 min



Informazioni disponibili

9 min

Servizi attivi su Firenze **23452**

Eventi del giorno a Firenze **2173**

Open Data disponibili **138**

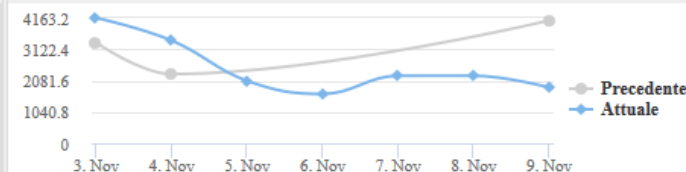
42.4%

Servizi du...

9 min

Accessi ai servizi singoli (web e mobile)

31 sec



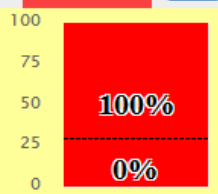
Bus Attivi

29 sec

24

Ataf RT

30 sec



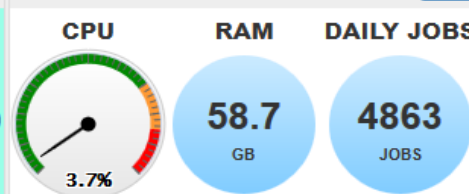
Parcheggi...

29 sec

55.4%

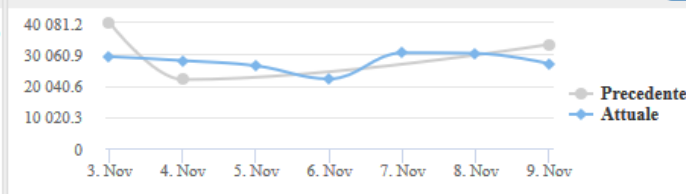
Smart City Engine

30 sec

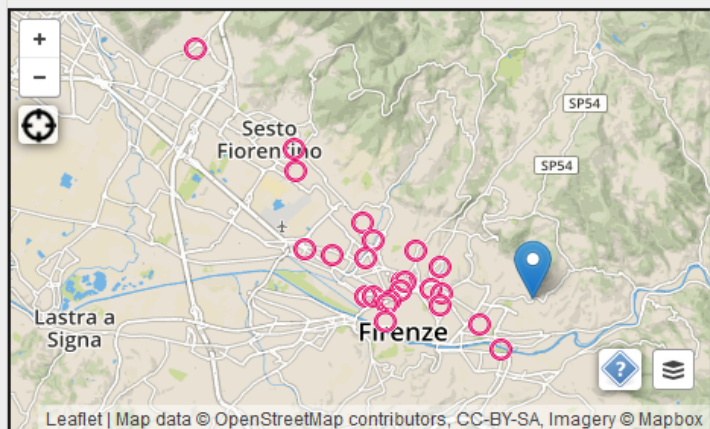


Rilievi wifi

9 min

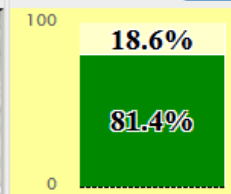


Real time position ATAF bus



Sensori RT

29 sec



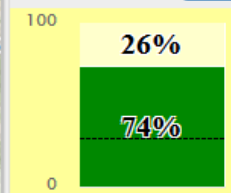
Previsioni meteo: FIRENZE

359 min



Parcheggi...

30 sec



Twitter Trends/citazioni

30 sec

PRINCIPALI TREND TWITTER:

#FIRENZE

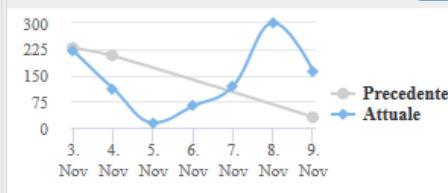
#FIORENTINA

#UFFIZI

CITAZIONI:

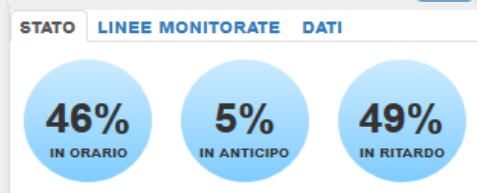
Query Servicemap

31 sec



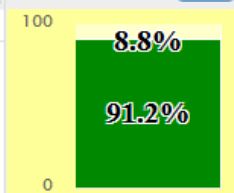
Stato linee ATAF

29 sec



Previsioni...

30 sec



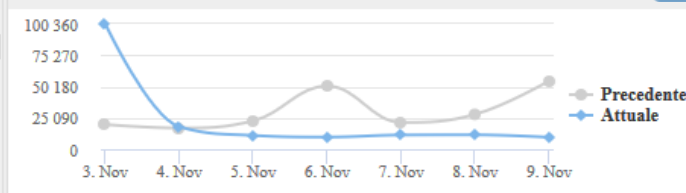
Elenco eventi del giorno

30 sec

- Il restauro delle "Storie della Genesi" di Paolo Uccello
- Il restauro delle "Storie della Genesi" di Paolo Uccello
- Tra arte e moda
- Tra arte e moda (2)
- Winkelmann, Firenze e gli Etruschi - Il padre

Query Km4city API

31 sec



Servizi agli Utenti

Firenze (sperimentale)

Tue 17 Jan @ 19:52:49



Recenti #hashtag più utilizzati

TRENDS QUOTES

- #FIRENZE
- #NEWS #FIRENZE
- #UFFIZI

Citazioni di Firenze frequenti...

TRENDS QUOTES

- @FIRENZEATAP
- @NAZIONE_FIRENZE
- @UNI_FIRENZE
- @NOVEDAFIRENZE
- @FIRENZEDIGITALE
- @FIRENZETURISMO

Eventi a Firenze oggi

- ERWIN WURM - GURKEN**
2016-09-23 to 2017-01-20
PIAZZA DI SANTA MARIA NOVELLA 10
- LA DIVINA COMMEDIA DI VENTURINO VENTURI**
2016-09-29 to 2017-02-26
COSTA SAN GIORGIO 2
- IN COLLEZIONE - UN PERCORSO D'ARTE DAL XIII AL XX SECOLO**
2016-10-01 to 2017-02-26
VIA MAURIZIO BUFALINI
- ARNO: FONTE DI PROSPERITÀ E FONTE DI DISTRUZIONE.**
2016-10-09 to 2017-02-04
VIALE DELLA GIOVINE ITALIA
- ARNO: FONTE DI PROSPERITÀ E FONTE DI DISTRUZIONE.**

PROTEZIONE CIVILE

GENERAL METEO

NULLO BASSO MEDIO ALTO

- RISCHIO IDRAULICO
- RISCHIO TEMPORALI
- RISCHIO IDROGEOLOGICO
- RISCHIO NEVE
- RISCHIO GHIACCIO
- RISCHIO VENTO
- RISCHIO MAREGGIATE

Stato servizio BUS a Firenze

STATO LINEE MONITORATE DATI

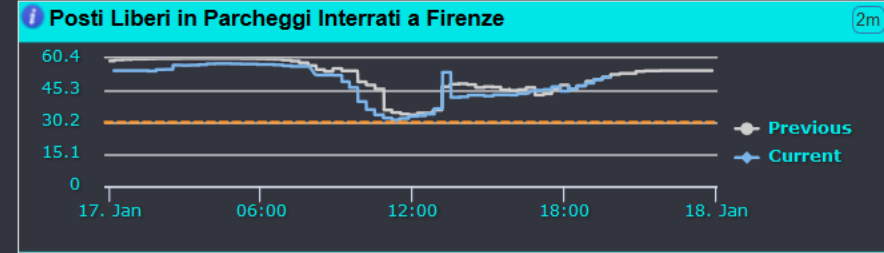
- 46% IN ORARIO
- 5% IN ANTICIPO
- 49% IN RITARDO

Previsioni del tempo a Firenze

Tuesday: light snow 3°C / 4°C
Wednesday: overcast 2°C / 5°C
Thursday: cloudy 2°C / 7°C
Friday: bit cloudy /
Saturday: cloudy /

Posti Liberi

51.5



Firenze

43.7693, 11.2560

Wed 9 Nov @ 23:36

- WiFi operativi: 100%
- SmartDS: via Santa Marta 3: 30.9%
- Bus Attivi: 24
- Real time position ATAP Bus: Map showing bus locations
- Stato linee ATAP: 2, 12, 33

42.4%

55.4%

26%

5.8%

SmartCity Processes

Fri 4 Nov @ 18:51:20

| | | | | | |
|------------------|------------------|------------------|------------------|-------------------|--------------------|
| ATAP: RUNNING | ATAP: RUNNING | ATAP: SUCCESS | ATAP: SUCCESS | CHECK RT: SUCCESS | EVENTI FI: SUCCESS |
| PARK: FAILED | PARK: SUCCESS | PARK: SUCCESS | PARK: SUCCESS | PARK: SUCCESS | PARK: SUCCESS |
| METEO: SUCCESS | METEO: SUCCESS | METEO: SUCCESS | METEO: SUCCESS | METEO: SUCCESS | METEO: SUCCESS |
| SENSORI: SUCCESS | SENSORI: SUCCESS | SENSORI: SUCCESS | SENSORI: SUCCESS | SENSORI: SUCCESS | SENSORI: SUCCESS |
| TWITTER: SUCCESS | TWITTER: RUNNING | FI WIFI: RUNNING | FI WIFI: SUCCESS | FI WIFI: SUCCESS | FI WIFI: FAILED |

Smart City API

<http://www.disit.org/7044>



Transport systems
Mobility, parking



Public Services
Govern, events, ...



Sensors, IOT
Cameras, ..



Environment,
Water, energy



Shops, services,
operators



Social Media
WiFi, network

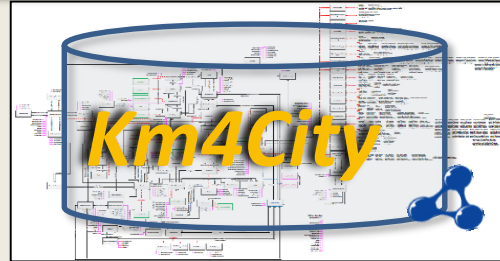


Static, Slow and Real Time data flows

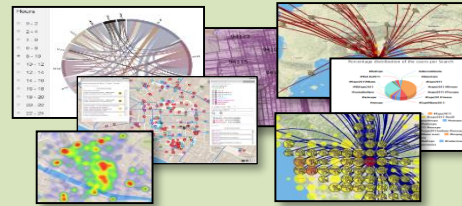
DISCES -- Distributed and parallel architecture on Cloud



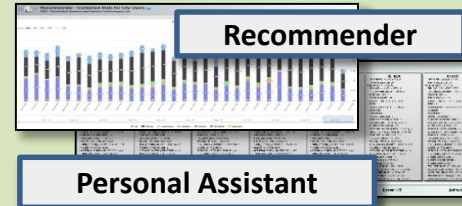
Km4City Smart City Engine



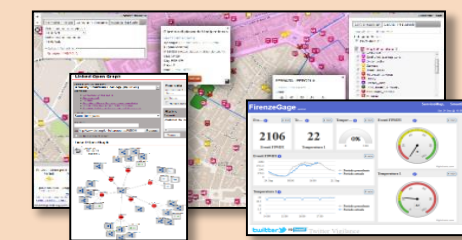
Big Data Analytics



Smartening Tools



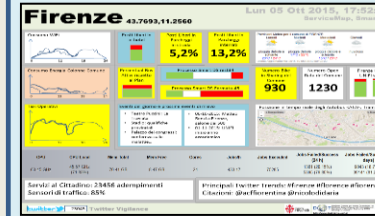
Development Tools



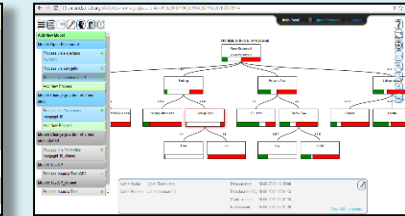
Km4City Smart City API

City Operators and Decision Makers

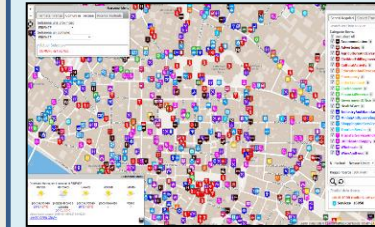
Dashboards



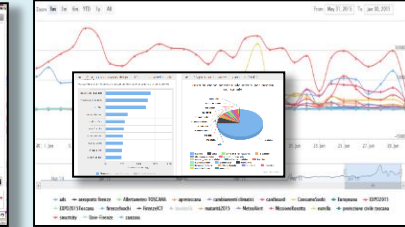
Smart Decision Support



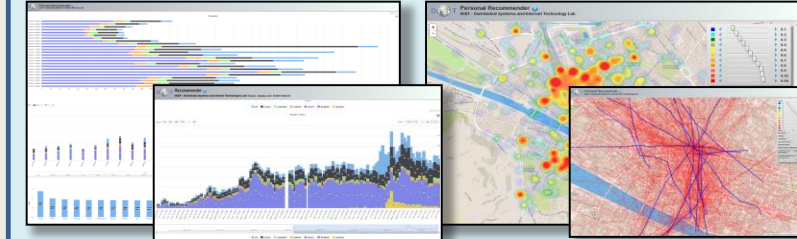
ServiceMap browser



Twitter Vigilance

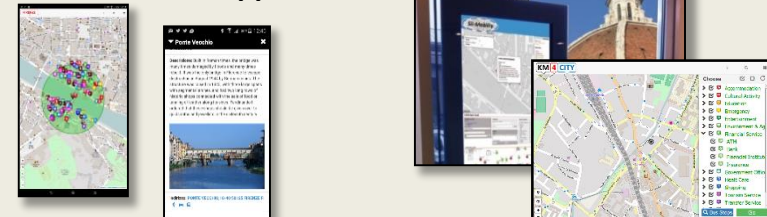


Analizers of City User Behavior



Tools for Final Users

Mobile e Web Apps



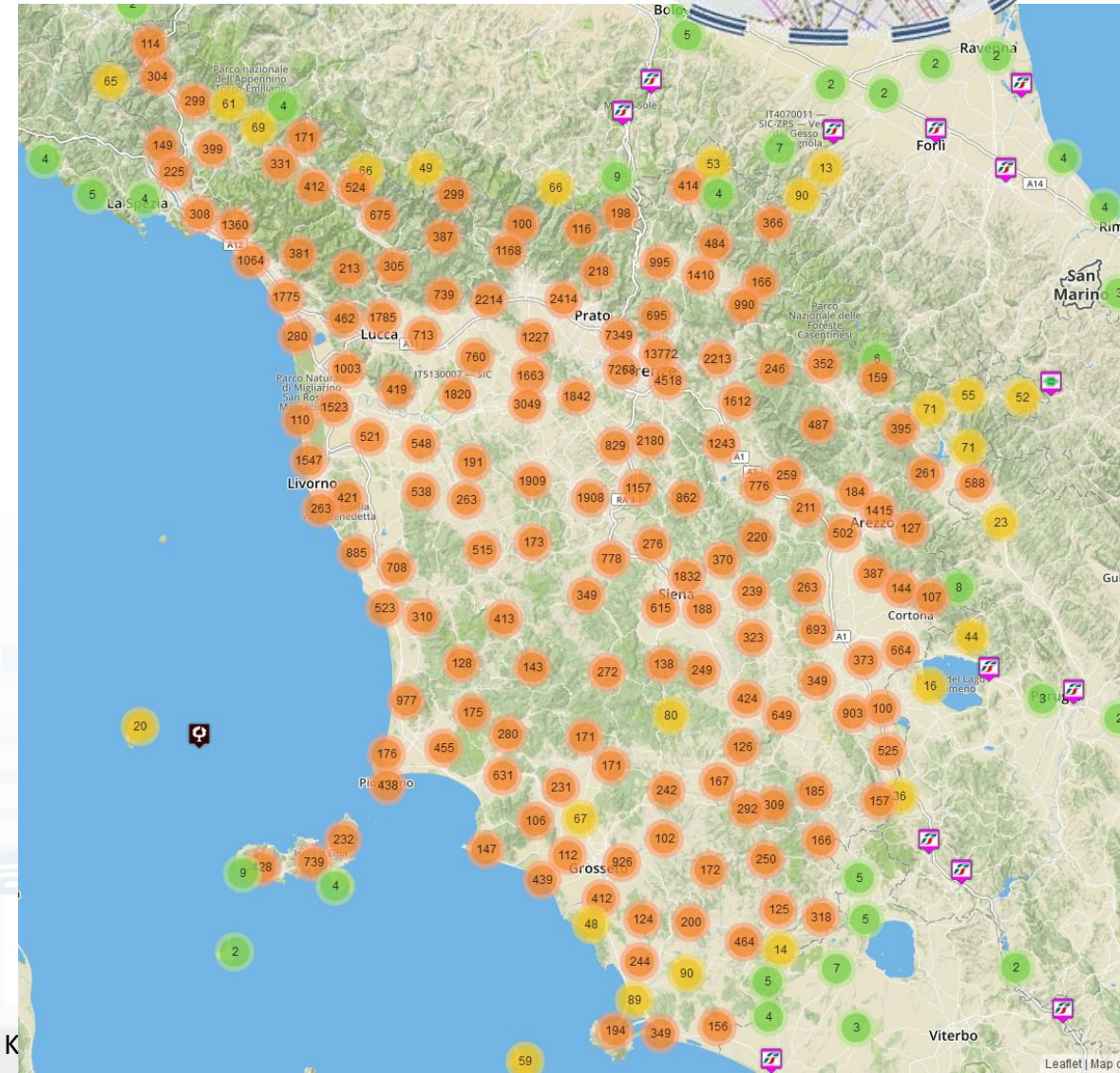


Smart City API

- Diversi livelli: Linked Open Data,
 - SPARQL query, Query ID, REST API
- Search: full Text, near GPS, along Line, into a polyline
 - Multidomain POIs
- Parking status
- TPL data
- Recommendation on demand
- Engagement on demand
- Weather forecast
- Events
- Twitter data related to tuned channels
- User Participation: POI rank, comment, foto
- Social Icons
- Routing (in progress)
- Authentication (social in progress)
- Reporting user behavior
- Getting profiled menu
- Etc...

Thematic Data Domain Tuscany

- **Street and geoinformation of the territory and details for routing, navigation, ...**
- **Mobility and Transport:** public and private, public transport, parking status, fuel stations prices, traffic sensors, etc.
- **Culture and Tourism:** POI, churches, museum, schools, university, theatres, events in Florence
- **Environmental:** pollution real time, weather forecast, etc.
- **Social Media:** twitter data
- **Health:** hospital, pharmacies, status of the first aid triage in major hospitals, ...
- **Alarms:** civil protection alerts, hot areas, ...



Concepts of Services: Macro and subcategory

The screenshot shows a web interface for selecting services. It is divided into two tabs: "Regular Services" and "Transversal Services". Under "Regular Services", there is a list of "Services Categories". The "Accommodation" category is selected and expanded, showing a list of subcategories. A red box highlights the subcategories under "Accommodation", and a red arrow points to it with the label "Service Class". Another red arrow points to the "Accommodation" category header with the label "20 Service Macro Classes". A third red arrow points to the "Accommodation" subcategory list with the label "Service Class".

Regular Services | Transversal Services

Services Categories

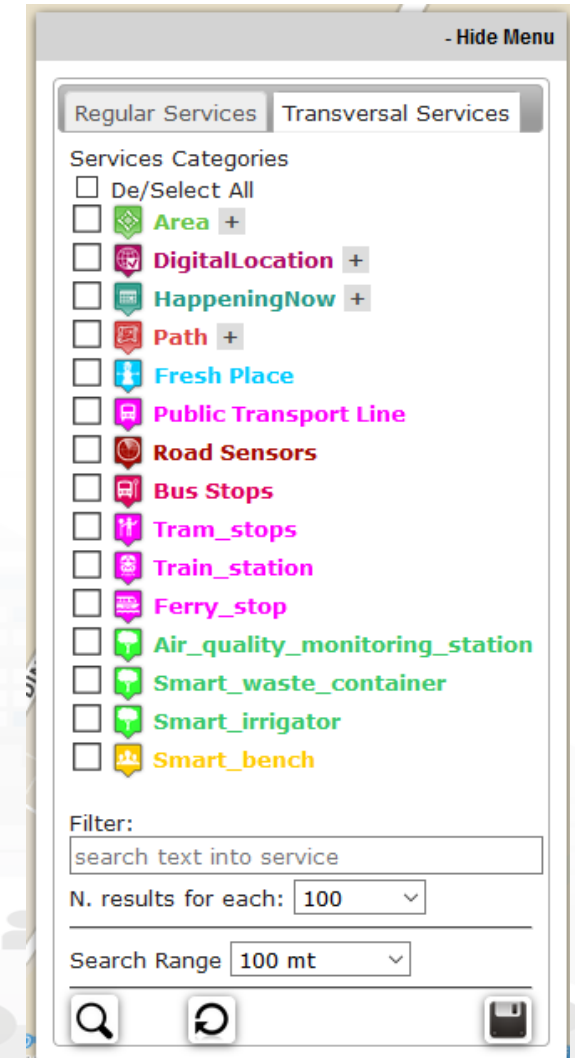
- De/Select All
- Accommodation** +
- Advertising** +
- AgricultureAndLivestock** +
- CivilAndEdilEngineering** -
- Architectural_consulting
- Building_construction
- Cartographers
- Civil_engineering
- Engineering_consulting
- Other_specialized_construction
- Specialized_construction
- Surveyor
- Technical_consultants
- CulturalActivity** +
- EducationAndResearch** +
- Emergency** +
- Entertainment** +
- Environment** +
- FinancialService** +
- GovernmentOffice** +
- HealthCare** +
- IndustryAndManufacturing** +
- MiningAndQuarrying** +
- ShoppingAndService** +
- TourismService** +
- TransferServiceAndRenting** +
- UtilitiesAndSupply** +
- Wholesale** +
- WineAndFood** +

Accommodation -

- Agritourism
- Beach_resort
- Bed_and_breakfast
- Boarding_house
- Camping
- Day_care_centre
- Farm_house
- Historic_residence

Access to Point of Interest information, POI

- **POI:** point of interest:
- **type:** macro and categoria
- **Position:** GPS, address, telephone, fax, email, URL, ..
- **Description:** textual, multilingua, with images, ...
- **Link** to dbPedia, Linked Open Data
- **Links to other services**
- **Real time data if any:** sensors data, timeline, events, prices, opening time, rules of access, status of services, status of queue, etc..
- *See transversal services on ServiceMap*
 - *Regular and in test platform*



Service Information: different kind of services

AURORA

LINKED OPEN GRAPH

Typology: Accommodation - Hotel

Email: info@hotelaurora.info

Website: www.hotelaurora.info

Phone: 055210283

Address: VIA L. ALAMANNI, 5

Cap: 50100

City: FIRENZE

Prov.: FI

TPL STOP : Piazza Stazione (Fr. Cc)

Vaubus

LINKED OPEN GRAPH

Lines:

No available routes

Display Bus per page

Search:

| Time | Line | Direction |
|----------|------------|----------------------|
| 08:48:00 | 2017-03-20 | FI-LU Piazzale Verdi |
| 08:16:00 | 2017-03-20 | FI-LU Piazzale Verdi |
| 10:09:00 | 2017-03-20 | FI-LU Piazzale Verdi |
| | 2017-03-20 | FI-LU Piazzale Verdi |
| | 2017-03-20 | FI-LU Piazzale Verdi |
| | 2017-03-20 | FI-LU Piazzale Verdi |

Page 1 of 1

Data currently not available

Loggia San Paolo

LINKED OPEN GRAPH

Typology: CulturalActivity - Monument_location

Digital Location

Address: VIA DELLA SCALA, 3

Cap: 50123

City: FIRENZE

Prov.: FI

Photos:

Description: The rounded arches, the stone skeleton and the glazed terracotta medallions recall the model of the Loggiato degli Innocenti. The medallions in glazed terracotta by Andrea della Robbia and his sons Marco and Luca contain seven polychrome figures of Santi Francescani and two works of mercy Cristo conforta un Giovane and Cristo conforta un Anziano. Beneath the portico can be admired the expressive embrace between San Domenico Guzman and San Francesco d Assisi by Andrea della Robbia

Giardino di piazza dell Indipendenza

LINKED OPEN GRAPH

Typology: Entertainment - Green_areas

Digital Location

Address: PIAZZA DELLA INDIPENDENZA, 15

Cap: 50129

City: FIRENZE

Prov.: FI

Note: areeverdi238

ZCS_1_D

LINKED OPEN GRAPH

Typology: TransferServiceAndRenting - Controlled_parking_zone

Digital Location

Address: VIA GUSCIANA

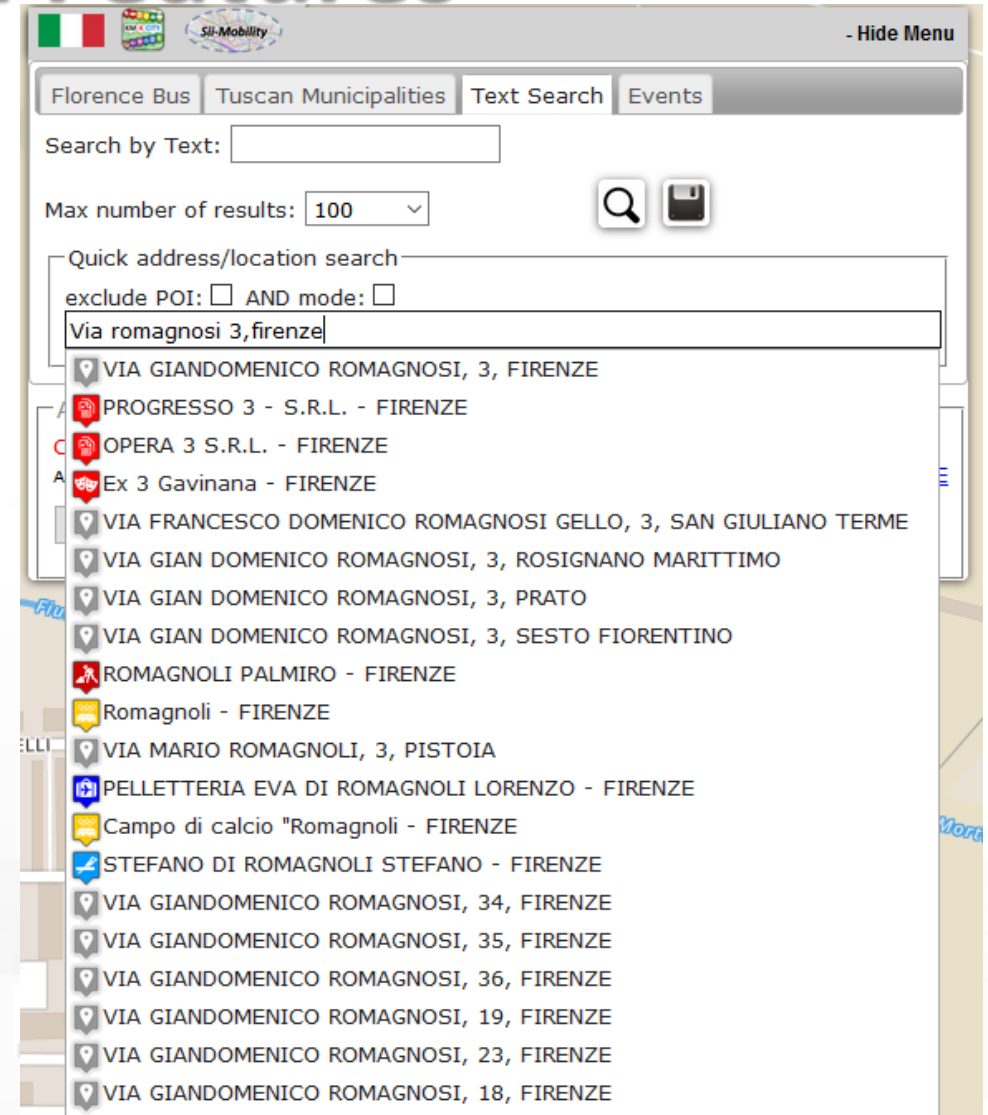
Cap: 50124

City: FIRENZE

Prov.: FI

General Text Search Features

- **Search by text for POIs via**
 - Full text: description, title, macro and category name
 - Filtering by macro and category
 - Filtering on distance and geometric shape
- **Search by text with assisted suggestion to get:**
 - Streets and civic numbers, or POI, locations



Search by Shape and Distance

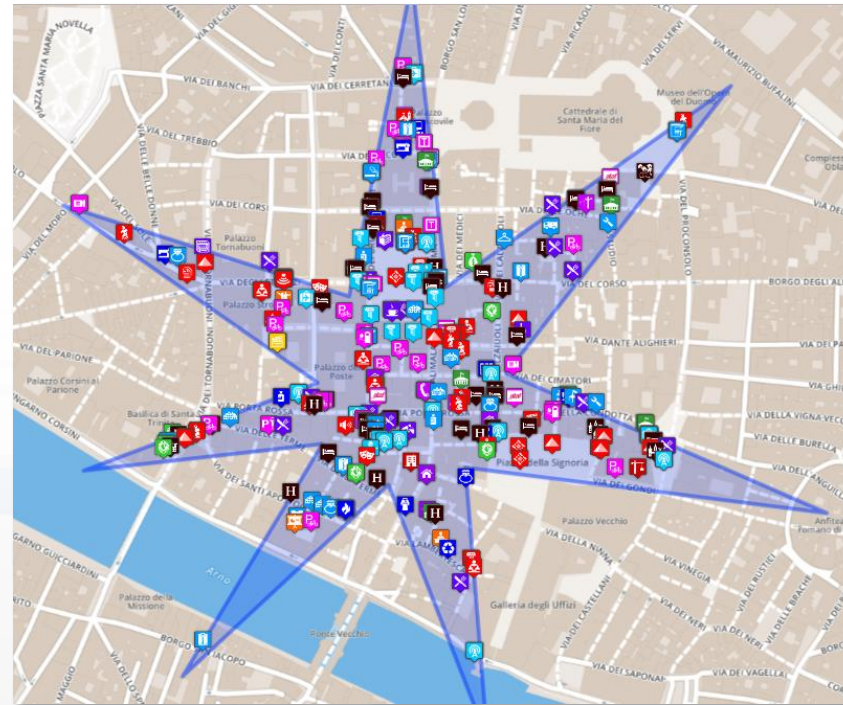
Around a point or POI



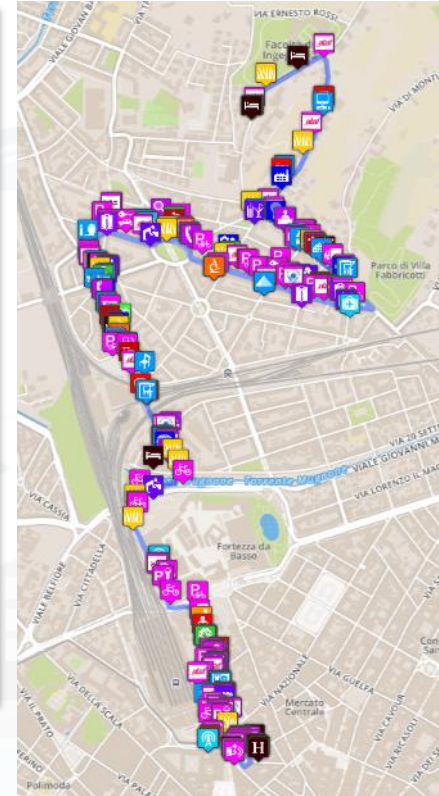
Each request or search in the Km4City model can be referred to a point and a ray, to an area, to a polyline



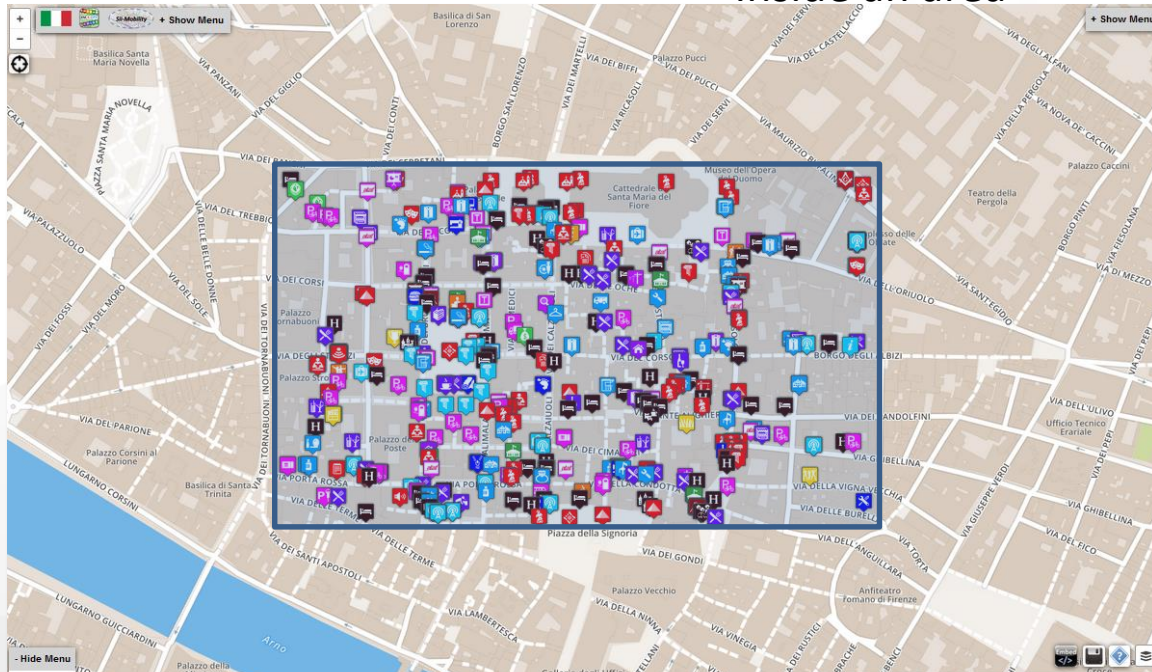
Inside a closed polyline



Along a polyline



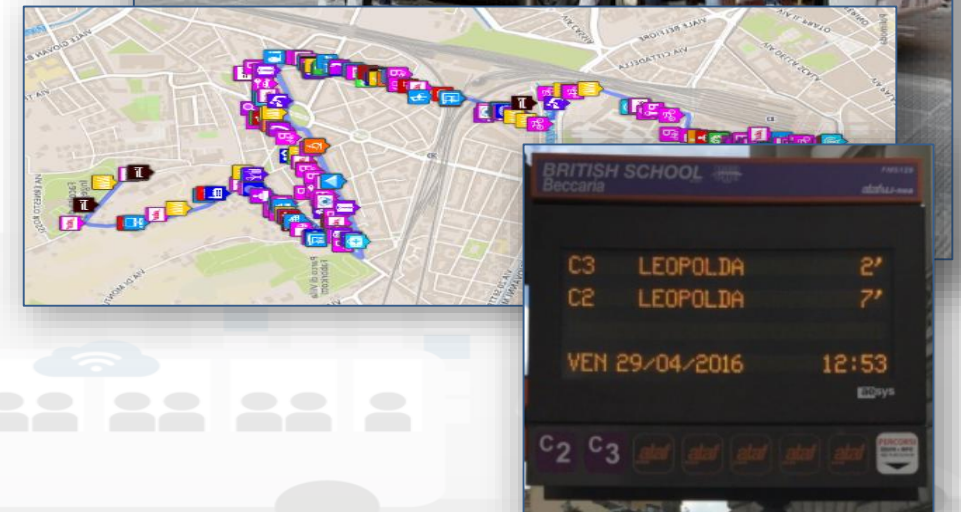
Inside an area



Supporting City Users in using Public Mobility

- **Public Transport, PT**

- Getting tickets
- Getting bus stops, lines, and timelines for bus, train and tramline (GTFS, ETL)
- Searching Services along a Pub. Transport line or closer to a stop
- Searching the closest bus stops
- searching for BUS stops via name
- real time delays of busses
- → multimodal routing for Pub. Transport



Supporting City Users in using Private Mobility

- **Private Transport**

- Getting closer parking
- **Getting parking forecast**
- Getting closer free space on parking
- Getting **fuel stations** location and fuel product prices
- Searching Services along a **path** or closer to a point or Service as Hotel, Restaurants, square, etc.
- Getting closer **cycling paths**
- → Recharging stations: location and status
- → Getting traffic information



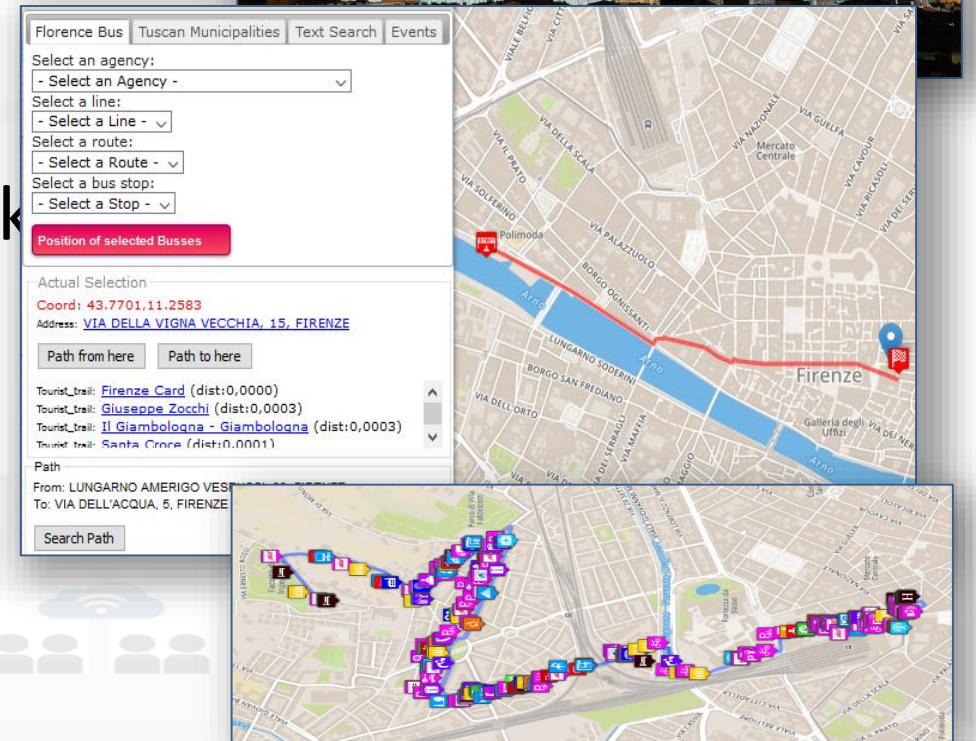
Private Mobility: routing and navigation paths

- To get the path from two points/POIs:
 - Shortest for pedestrian
 - Quietest for pedestrian
 - Shortest for private vehicles
- Search for POIs along the identified Path!
- <http://www.disit.org/ServiceMap>

The screenshot displays the Sii-Mobility web application interface. At the top, there are navigation tabs for 'Florence Bus', 'Tuscan Municipalities', 'Text Search', and 'Events'. Below these are several dropdown menus for selecting an agency, line, route, and bus stop. A red button labeled 'Position of selected Busses' is visible. The main area features a 'Quick address/location search' field with an 'exclude POI' checkbox. Below this, the 'Actual Selection' section shows the coordinates '43.7681, 11.2537' and the address 'LUNGARNO DEGLI ARCHIBUSIERI, 18, FIRENZE'. There are buttons for 'Path from here' and 'Path to here'. The 'Path' section shows the route from 'PIAZZA DELLA STAZIONE, 42, FIRENZE' to 'LUNGARNO DEGLI ARCHIBUSIERI, 18, FIRENZE' via 'foot_shortest'. A 'Search Path' button is also present. The 'Found 1 paths (in 5.959s)' section lists the path details: 'Length: 1262m arrival time: 12:58:12 (00:14:24)'. The path is shown on a map with a red line and a list of points of interest (POIs) along the route, represented by colorful icons.

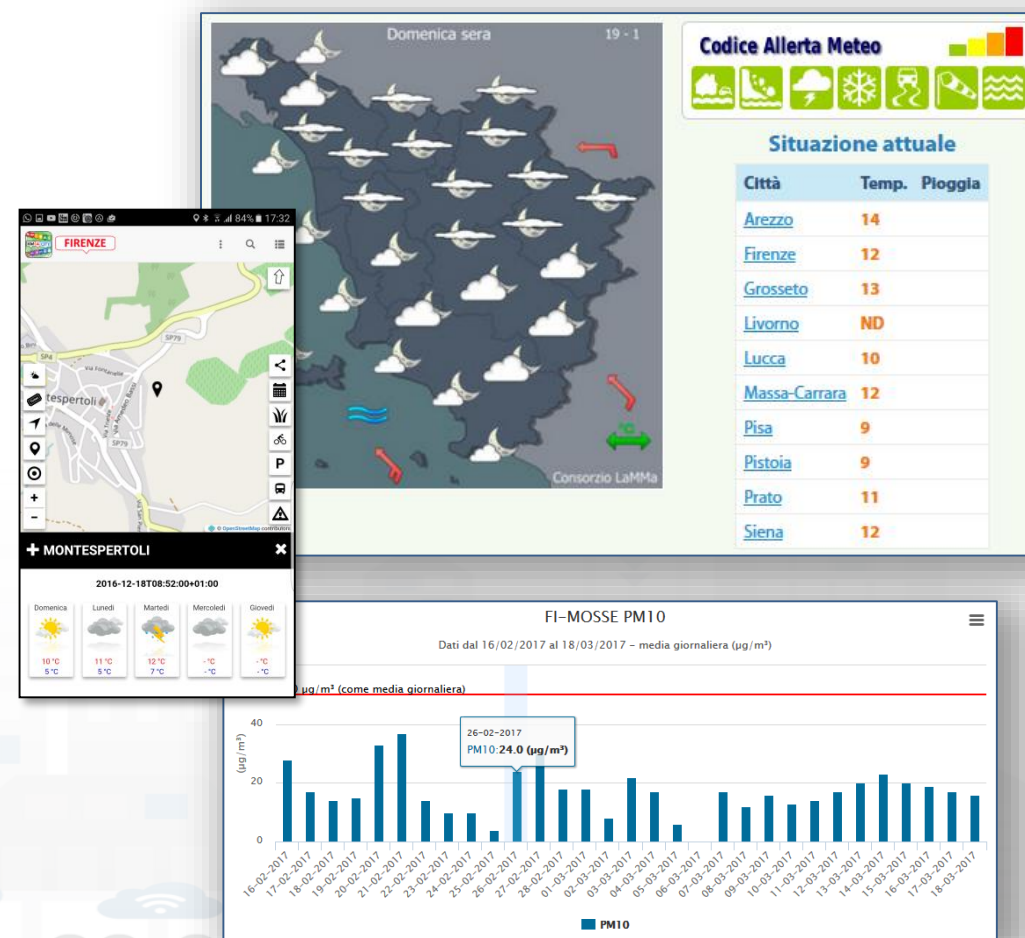
New Experience to access at Cultural and Touristic info

- Getting location and description of Point of Interests, POIs: culture and tourism first
 - Location, images, phone, URL, etc.
 - Get image, video, audio, ...
- Search for POIs in areas and closer
- Get routing to reach location or POI by walking downtown
 - searching Services along the path
- Search for location, full text assisted
- Leave a score, take a picture, etc..



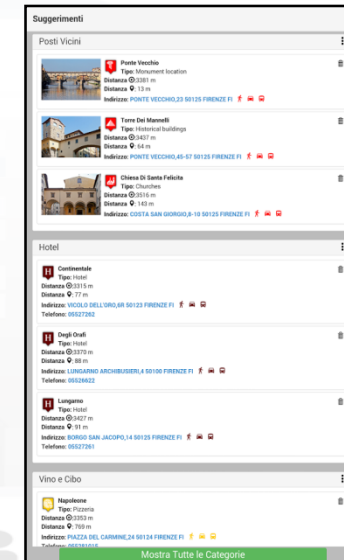
Access at Environmental information

- Getting weather forecast for the next hours and days
- Getting alert information from Civil protection
- Getting air quality status
- getting actual weather status: temperature, humidity, pressure, rain level,
- etc.



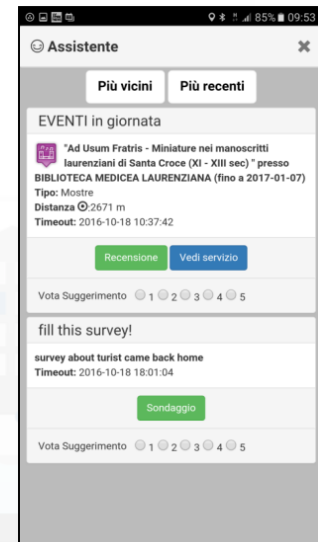
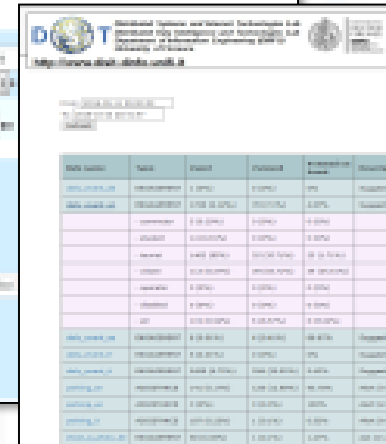
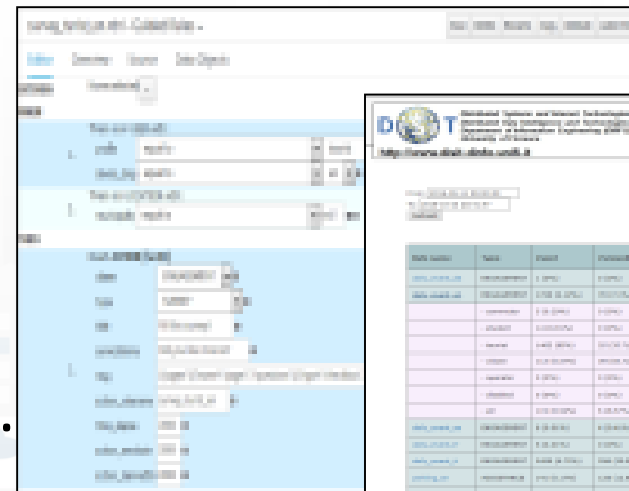
Profiled Suggestions to City Users

- Personalized suggestions
 - The server provide suggestions in the user context (location and time) arranged in a number of categories
 - Culture, mobility, food and drink, etc.
 - Alerts: civil protection, city council, twitter data, etc.
 - The city user may reject some of them, thus the suggestion engine learns about preferred topics and category



Profiled Engagements to City Users

- The user are profiled to learn habits:
 - Personal POI and paths
 - Mobility habits
- Information and engagements sent to the city users are programmed according to the user evolution to:
 - Stimulate virtuous habits
 - More sustainable habits
 - More healthy habits, etc.
 - Get feedbacks
 - Provide bonus and prices,
 - Send alerts,



Monitoring Traffic Flow and Parking

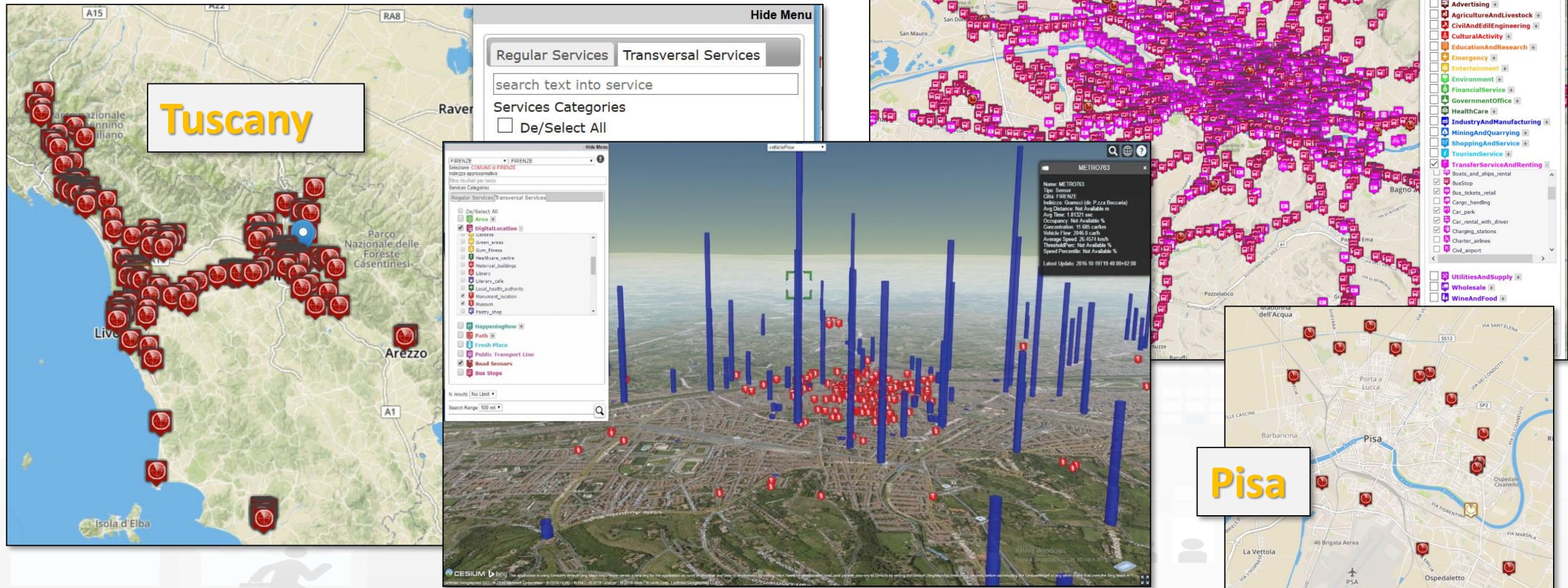
predictions



<http://www.km4city.org/?controlRoom>

Traffic Flow Tools

- Spire and Virtual Spires (cameras), Bluetooth, ..
- Specifically located: along, around, ..





File Modifica Visualizza Cronologia Segnalibri Tife Strumenti Aiuto

Km4City Back Office and ... x ServiceMap3D x +

www.disit.org/servicemap3d/ Cerca

- Hide Menu

PISA PISA

Selection: **COMUNE di PISA**

Approximate address:

filter results by text

Services Categories

Regular Services Transversal Services **3D Data**

Car park +

Road Sensors +

Scale x2

Display next information manually:

How often to change displayed data? 10 seconds

How often to update informations? 2 minutes

N. results: 100

Search Range 500 mt

Sensori traffico e parcheggi real time 3D Su Pisa

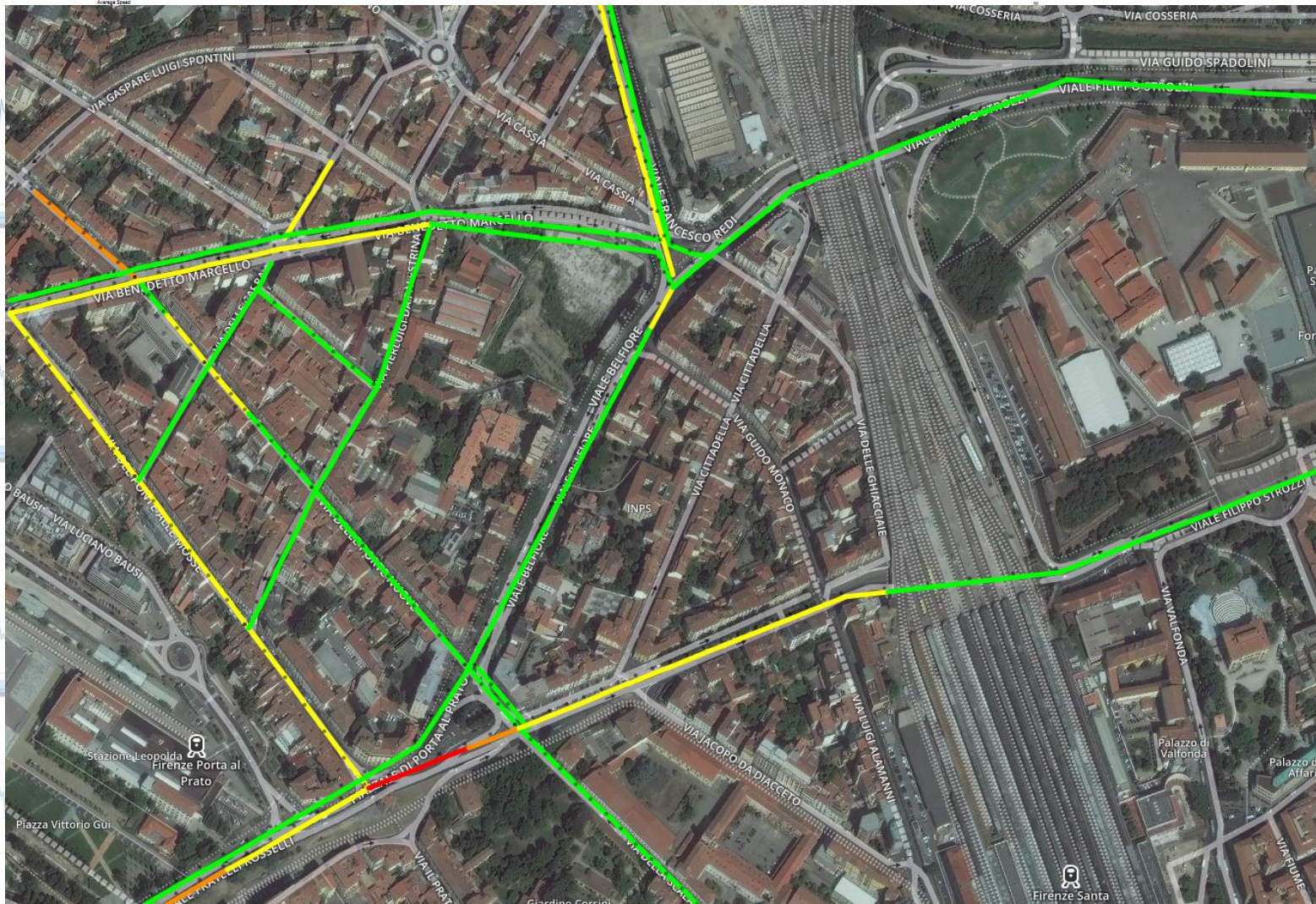
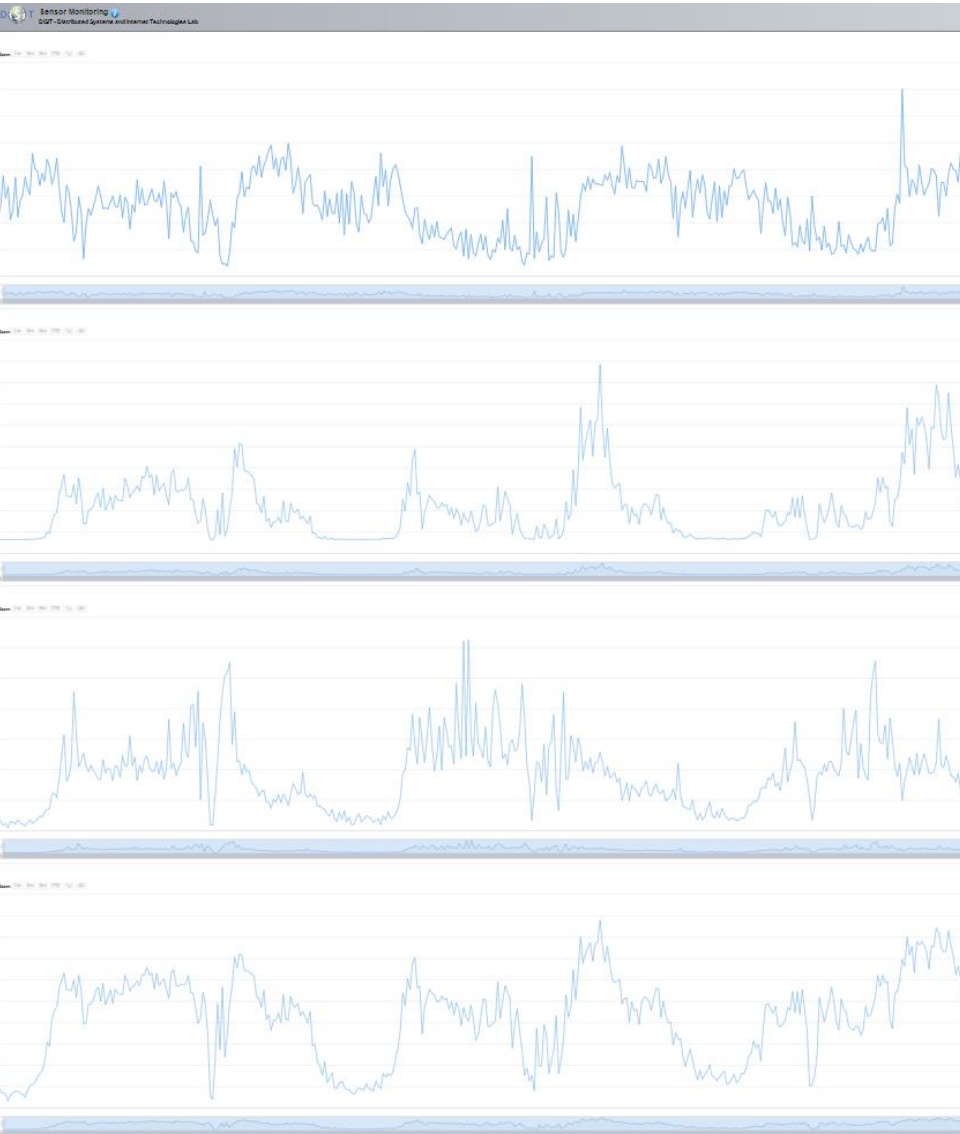
CESIUM bing Earthstar Geographics SIO © 2016 Microsoft Corporation © 2010 NAVTEQ © Harris Corp, Earthstar Geograph

- Hide Menu

Car park: occupiedParkingLots Road sensor: occupancy

Windows taskbar: ENG 18:33

Traffic Flow data



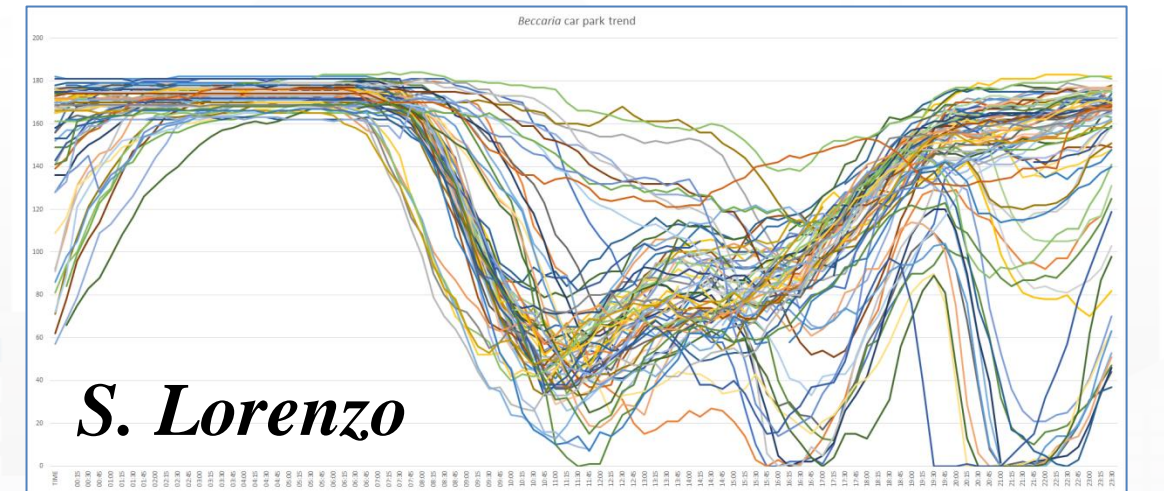
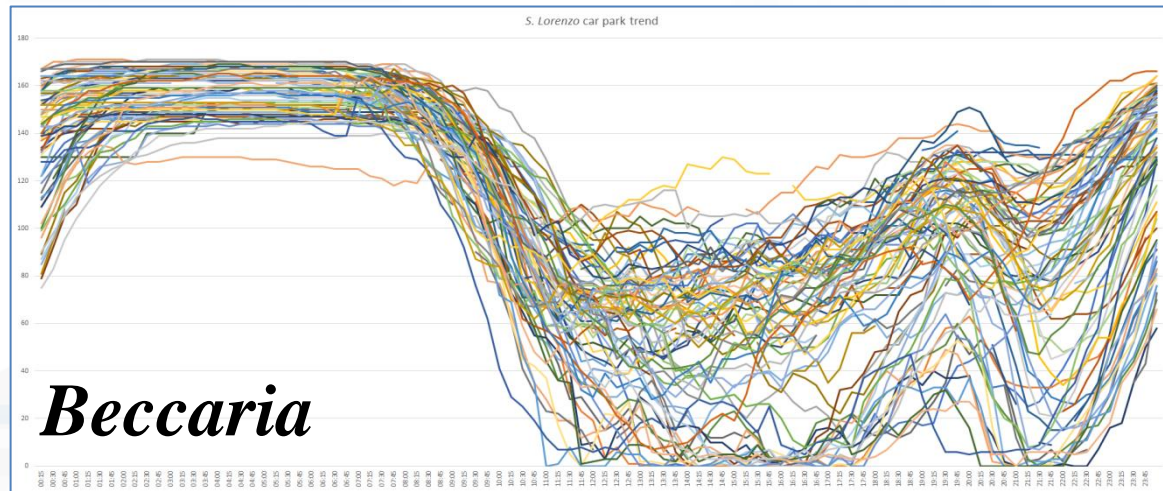
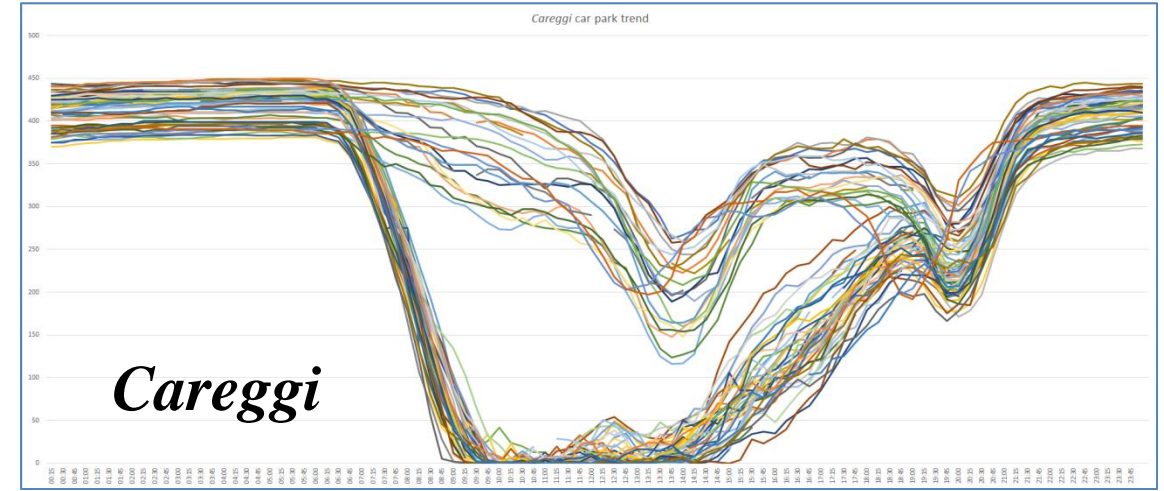
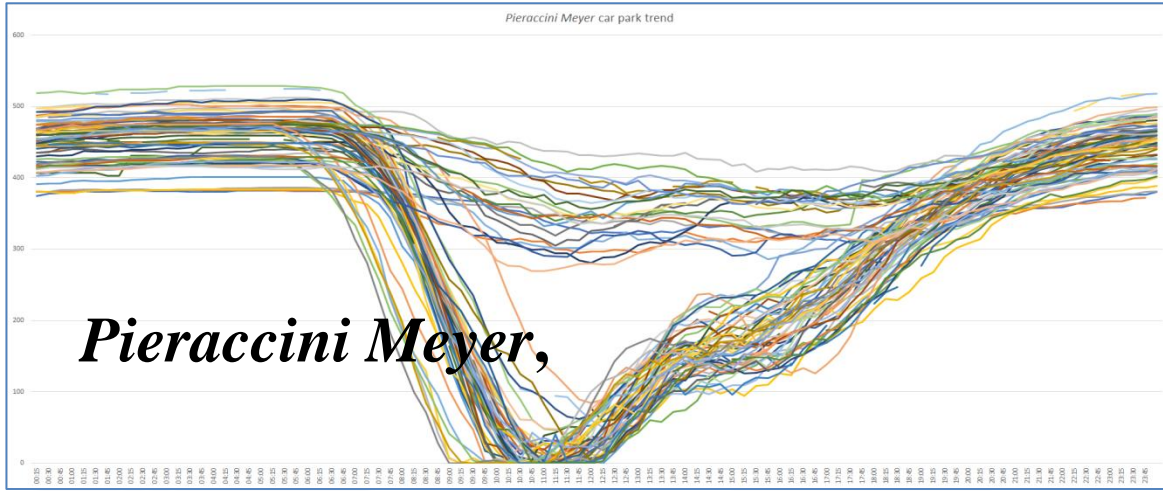


UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB
<http://www.disit.org>

Free Parking space trends



12 parking areas in Florence

DISIT lab overview, January 2017, Florence

Free Parking PREDICTIONS



| Careggi car park | | | |
|--------------------------------------|--------------------|------|------|
| Model features | BRNN model results | | |
| | R-squared | RMSE | MASE |
| Baseline | 0.974 | 24 | 1.87 |
| Baseline + Weather | 0.975 | 24 | 1.75 |
| Baseline + Traffic sensors | 0.975 | 24 | 2.04 |
| Baseline + Weather + Traffic sensors | 0.975 | 24 | 1.87 |

- Active on
- «Firenze dove cosa»
- «Toscana dove cosa»



Servizi: 23 su 23 disponibili

Qui Intorno
Suggerimenti
Rimuovi

+ Parcheggi

Più vicini Più vicini Posti liberi

| | | Tempo reale | |
|--|---|-------------------|-------------|
| | Parcheggio S. Lorenzo | 91 | 04-06 19:00 |
| | → Parcheggio auto | | |
| | 1796 m 334 m | Previsione | |
| | | 102 | 04-06 19:15 |
| | | | |
| | | Tempo reale | |
| | Parcheggio Stazione Firenze S.M.N. | 428 | 04-06 19:00 |
| | → Parcheggio auto | | |
| | 1826 m 339 m | Previsione | |
| | | 422 | 04-06 19:15 |

Monitoring City users

Via Wi-Fi & forecast

<http://www.km4city.org/?controlRoom>

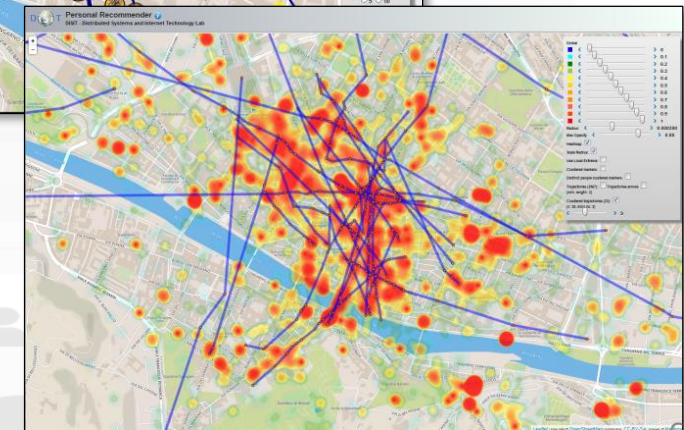
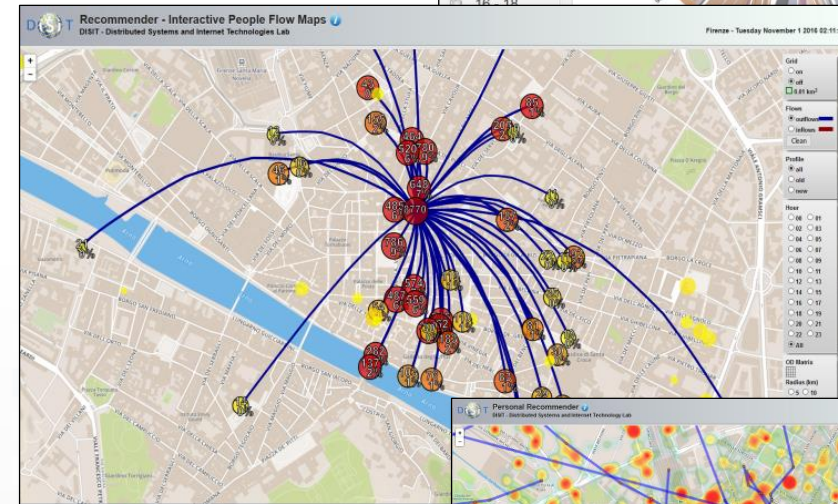
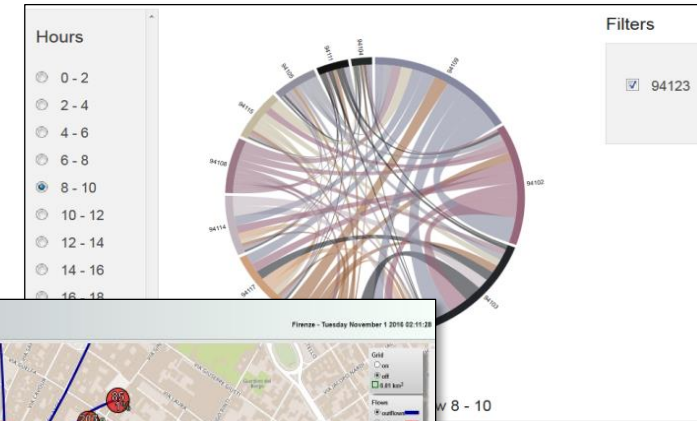
<http://www.km4city.org/?devTools>

<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?app>

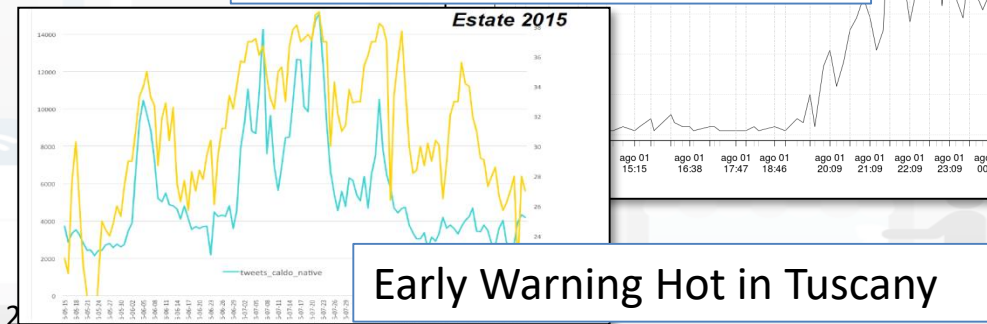
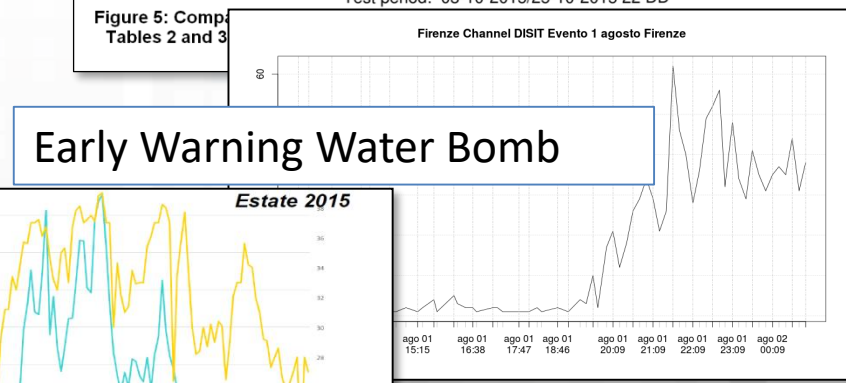
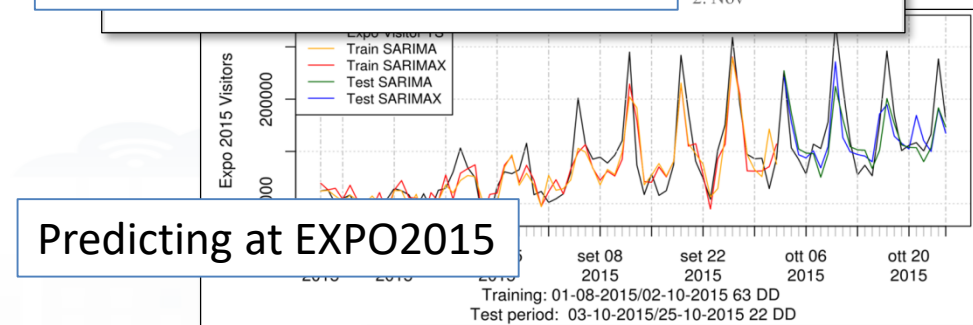
User Behaviour Analysis

- Monitoring movements by traffic flow sensors
 - Spires and virtual spires
- Monitoring movements from Mobile Cells
 - Unsuitable for precise tracking and OD production
- Monitoring movements from Wi-Fi
- Monitoring movements and much more from mobile Apps



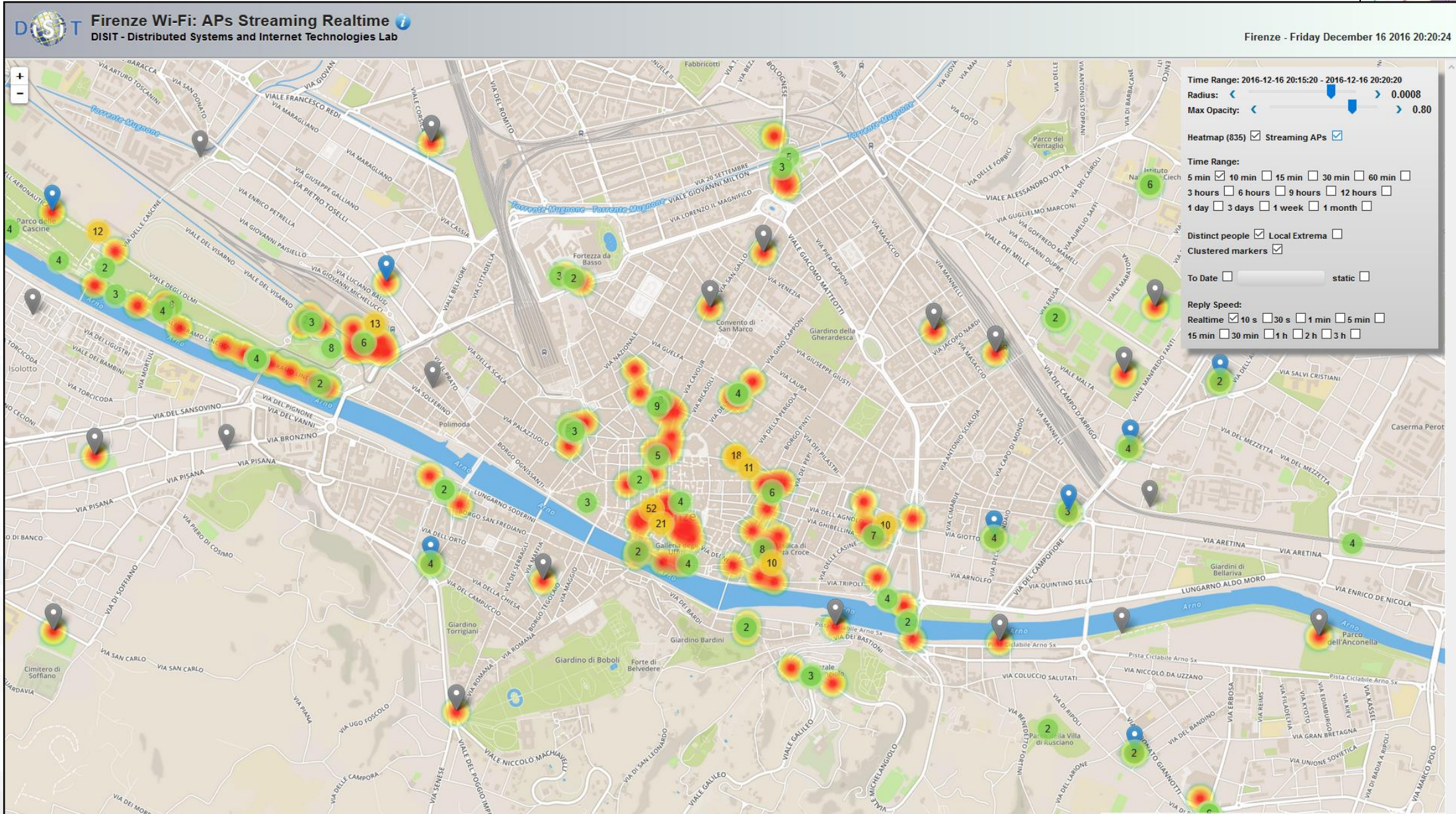
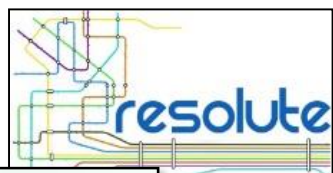
Predicting Models for Admin. & City Users

- Aiming at improving
 - quality of service,
 - distributing workload
 - early warning
- Traffic Flows & People Flows
 - crowd , #number of people
- Parking Status → free slots
- Weather Forecast (LAMMA)

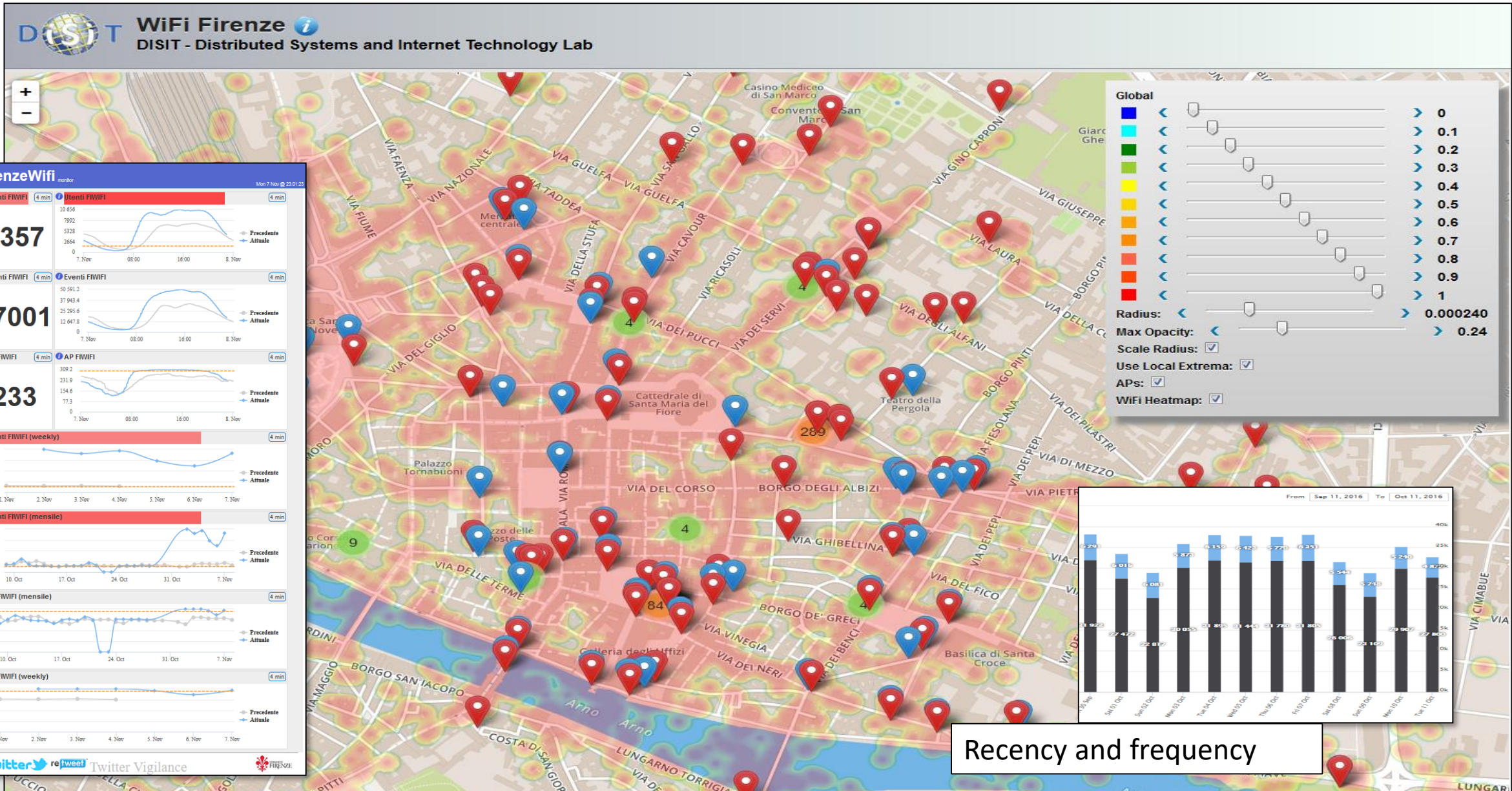




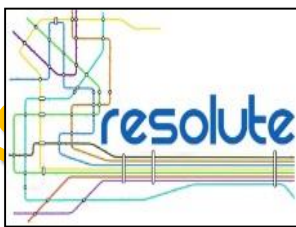
Real Time Monitoring of Wi-Fi network



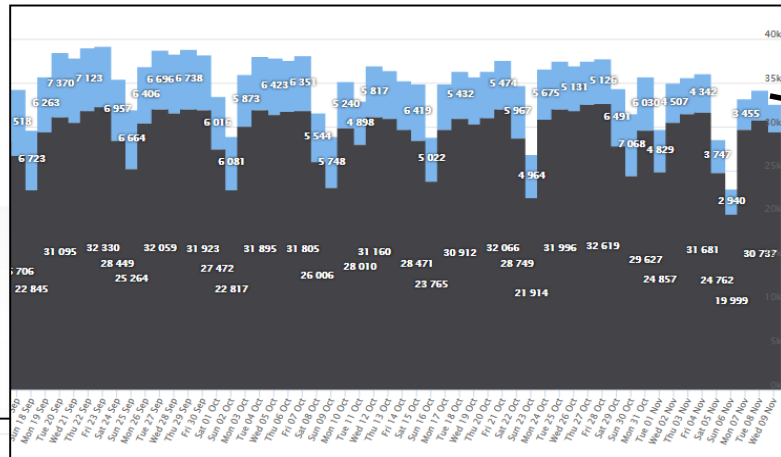
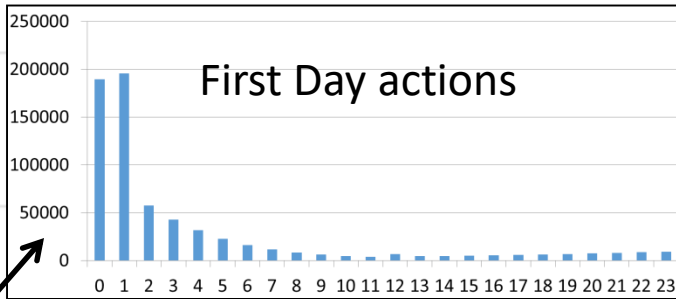
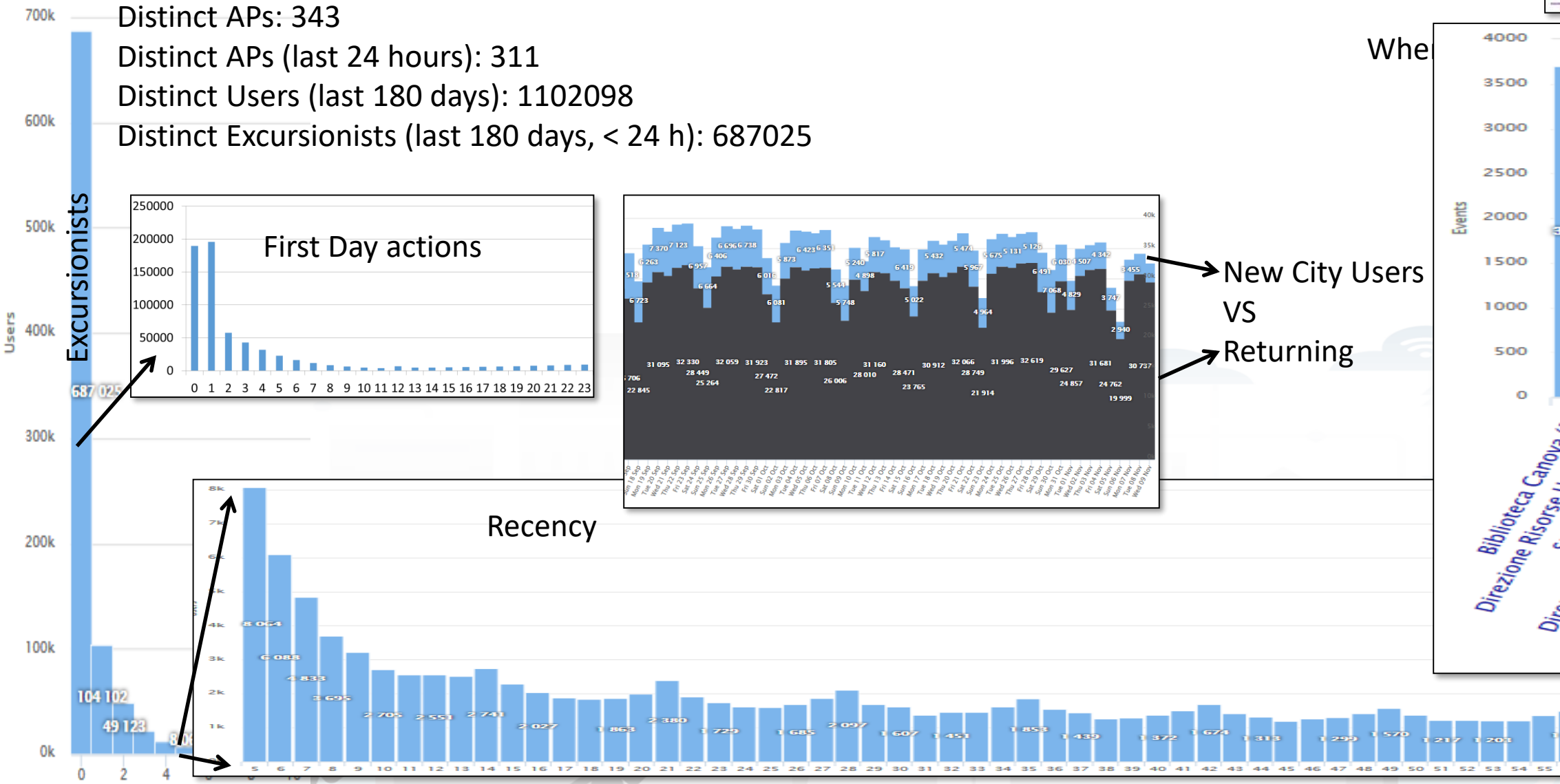
WiFi Monitor tool



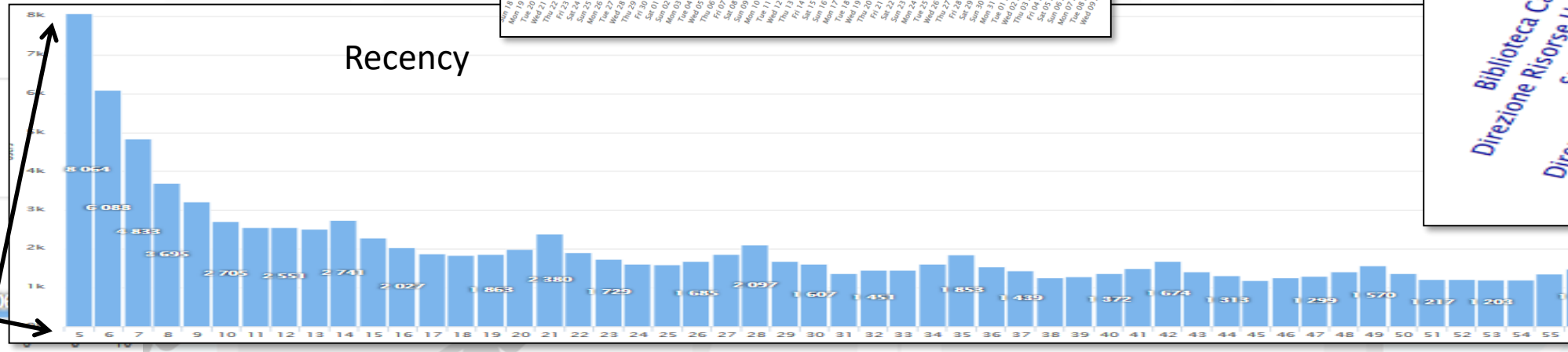
User Behavior Analysis



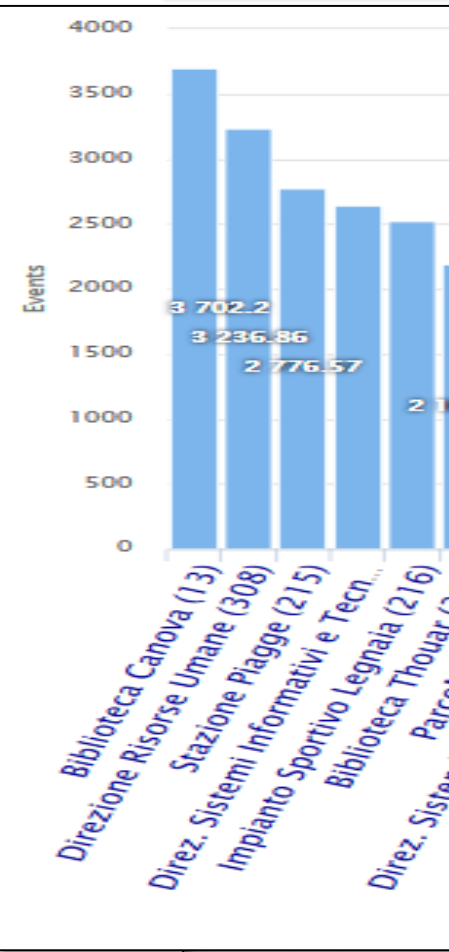
Distinct APs: 343
 Distinct APs (last 24 hours): 311
 Distinct Users (last 180 days): 1102098
 Distinct Excursionists (last 180 days, < 24 h): 687025



New City Users
VS
Returning



Whe





Characterizing City Areas

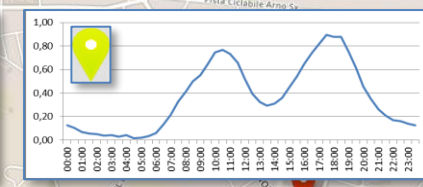
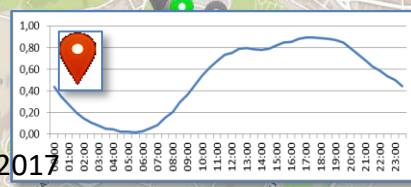
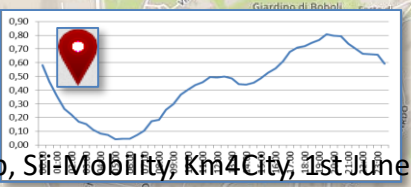
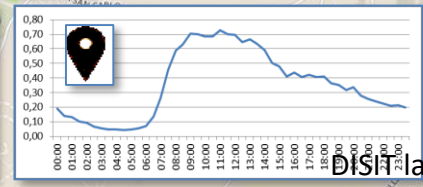
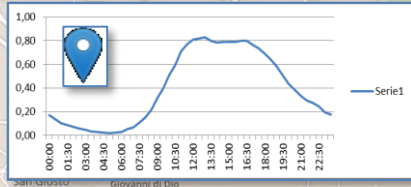
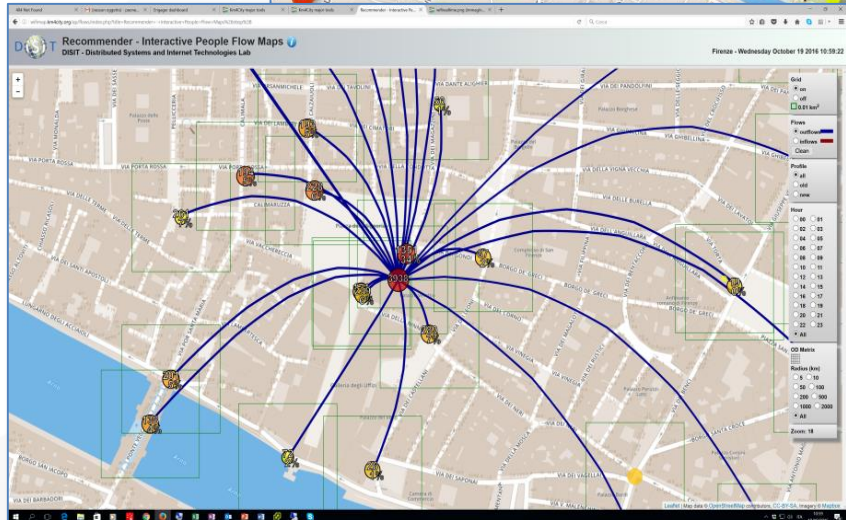
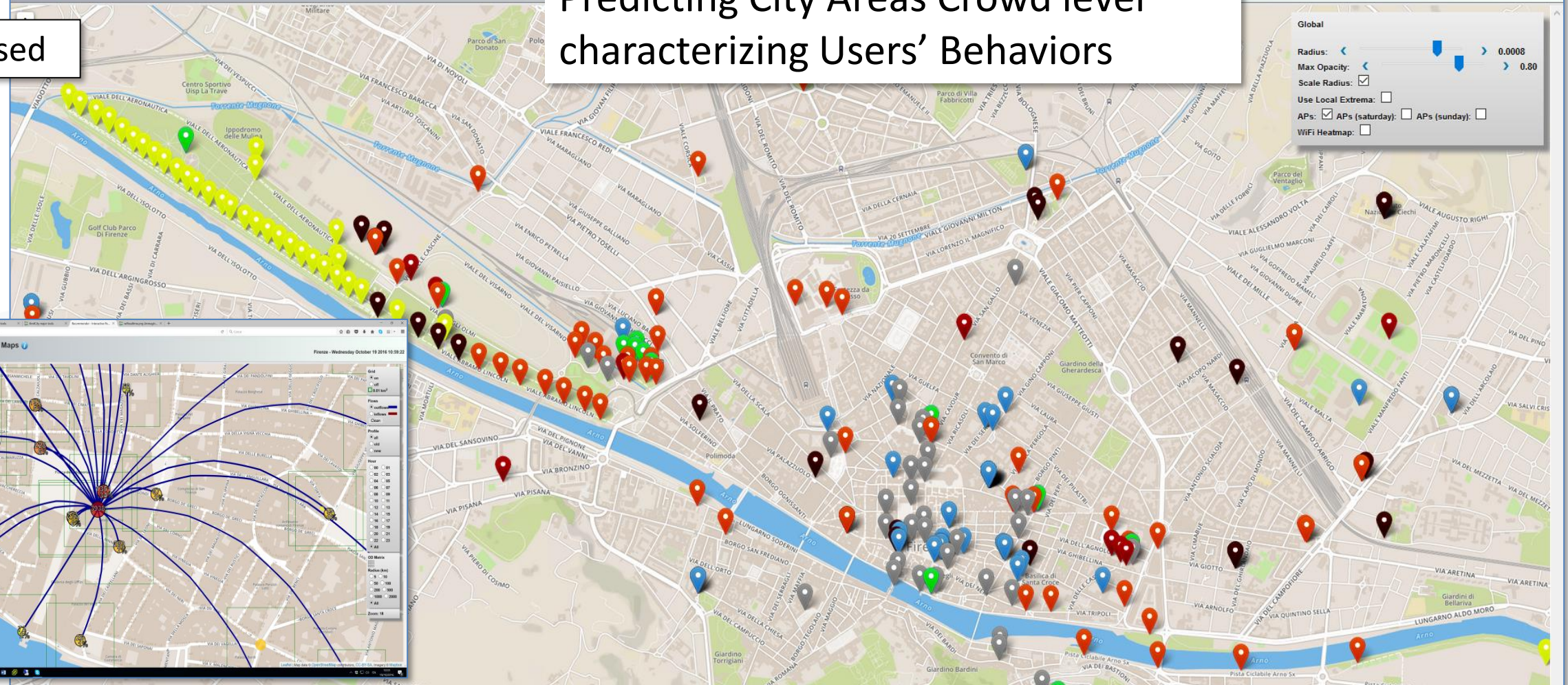


DISIT Firenze Wi-Fi: Access Points Clusters Coverage Map
DISIT - Distributed Systems and Internet Technologies Lab

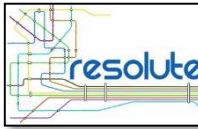
Wi-Fi based

Predicting City Areas Crowd level characterizing Users' Behaviors

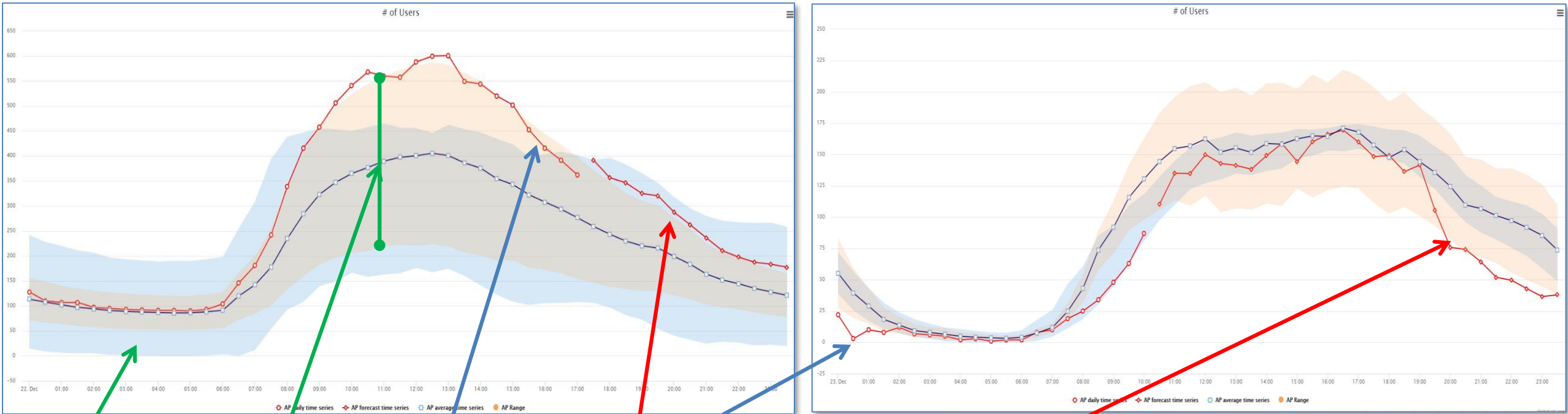
Firenze - Saturday November 12 2016 19:16:33



Prediction and identification of anomalies



Guessing number of users of Wi-Fi Access Points



Cluster confidence

AP average and confidence

Actual AP trend for today

AP prediction for the next time slot in the day on the basis of past weeks

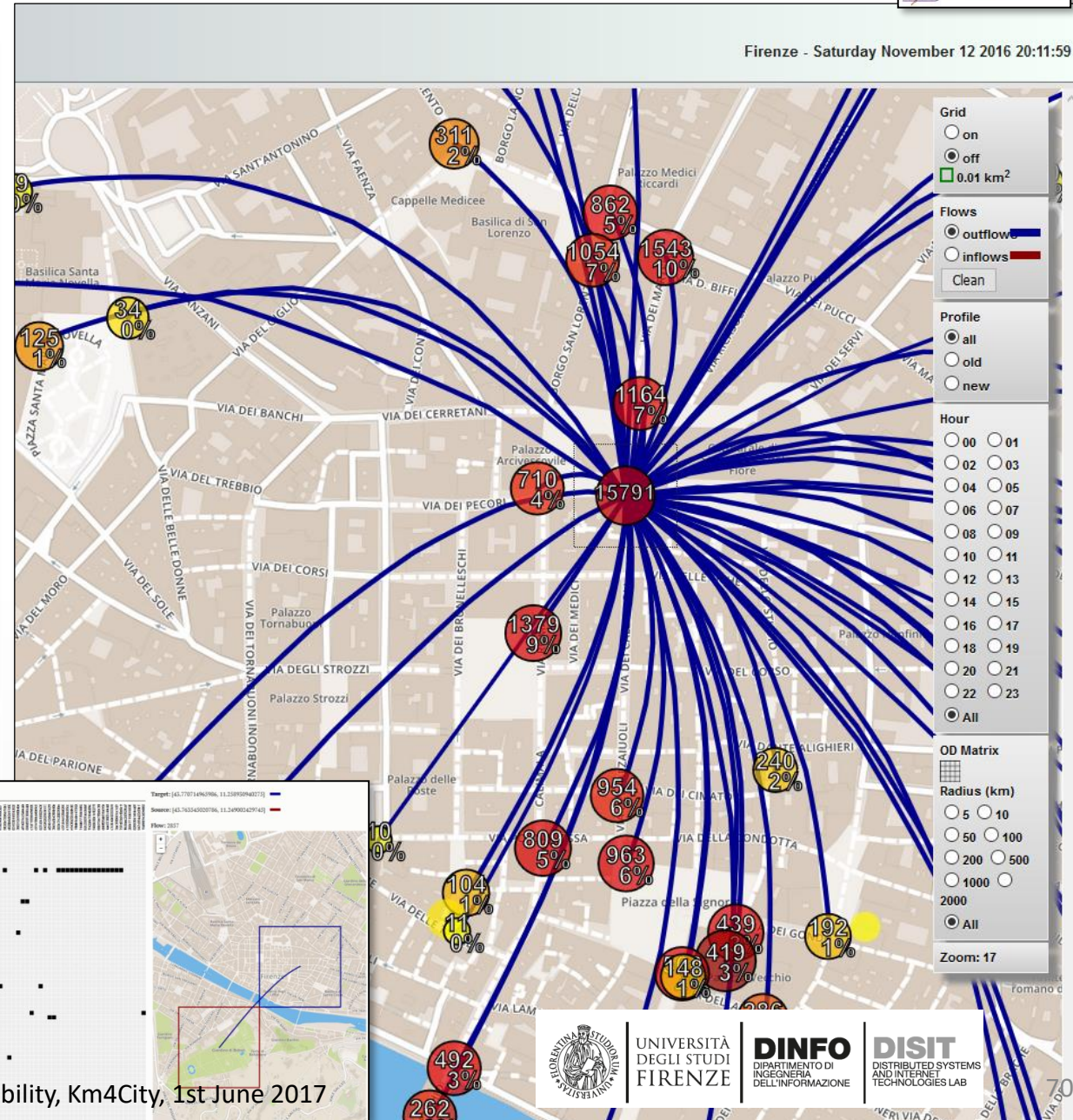
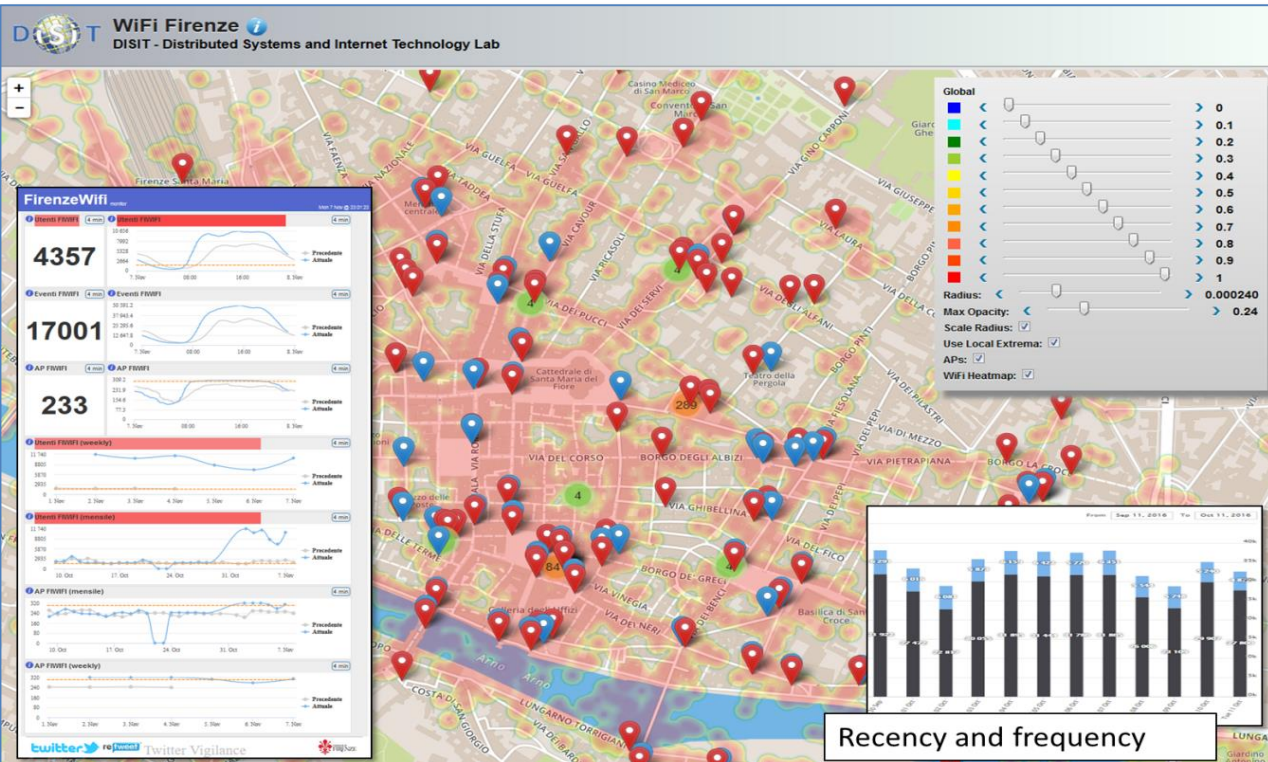
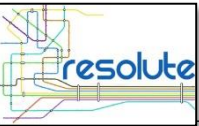


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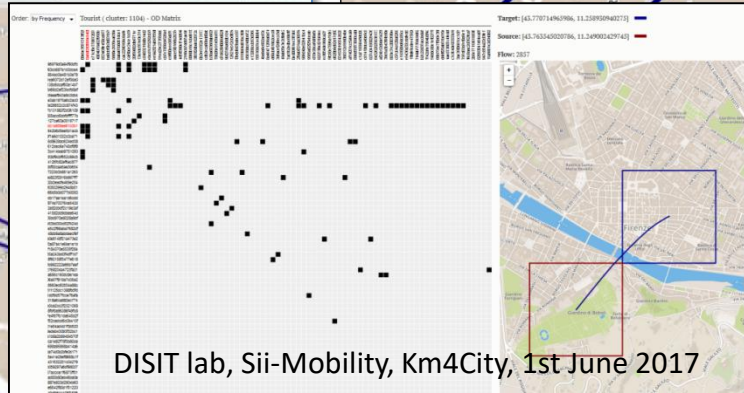
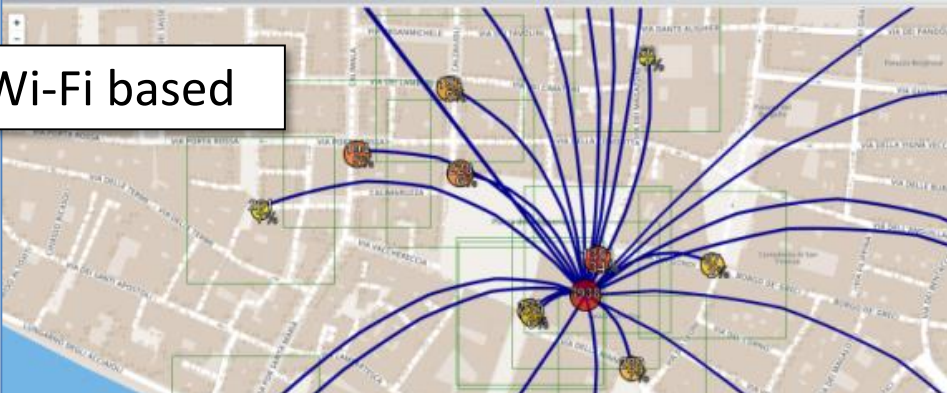
DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB

Origin Destination Matrix Estimation



Wi-Fi based



Engaging Users via Mobile App

<http://www.km4city.org/?controlRoom>

<http://www.km4city.org/?devTools>

<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?app>



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INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB
<http://www.disit.org>

Km4CityMobile App



web application

<http://www.km4city.org>

What do you want to do?

| | | |
|-------------------|----------------------|----------------|
| Discover the City | Points of Interest | Search |
| Public transport | Bus Ticket | Car Park |
| Events | Suggestions Near You | We Recommend |
| Weather | Assistant | Navigator |
| Favourites | Chronology | Latest Reviews |
| Alert Civil Prot. | Settings | Vote APP! |
| Information | About Us | |

Choose Services

- Accommodation
- Advertising
- Agriculture And Livestock
- Civil And Edil Engineering
- Cultural Activity
- Education And Research
- Emergency
- Entertainment
- Environment
- Financial Service
- Government Office
- Health Care
- Industry And Manufacturing
- Mining And Quarrying
- Shopping And Service
- Tourism Service
- Transfer Service And Renting

Giardino Di Boboli

Tipo: Digital Location

Descrizione: The Prince s Way ends in the Giardino di Boboli, near the Grotta del Buontalenti, that is a very masterpiece of the Mannerist architecture and sculpture

Descrizione: Il Percorso del Principe termina nel Giardino di Boboli, nei pressi della Grotta del Buontalenti, vero e proprio capolavoro dell'architettura e della scultura manierista

Choose

- Accommodation
- Cultural Activity
- Education
- Emergency
- Entertainment
- Environment & Ag
- Financial Service
- ATM
- Bank
- Financial Institut

FIRENZE

ESERCITAZIONE MUGNONE 2016

MUGNONE 2016
28 maggio 2016

prevede: Firenze (FI) (ZONA: A3)

| RISCHIO | TEMPI | ALLERTA |
|---|--|-----------|
| IDROGEOLOGICO IDRAULICO RETICOLO MINORE | Dalle ore 13.00 di Venerdì 27 maggio 2016 alle ore 18.00 di Venerdì 27 maggio 2016 | GIALLO |
| IDROGEOLOGICO IDRAULICO RETICOLO MINORE | Dalle ore 18.00 di Venerdì 27 maggio 2016 alle ore 12.00 di | ARANCIONE |

Suggerimenti

Piazza SS. Annunziata

Tipo: Squares
Distanza: 1949 m
Indirizzo:

Piazza Santissima Annunziata

Tipo: Squares
Distanza: 1949 m
Indirizzo:

Trattoria Gozzi

Tipo: Trattoria
Distanza: 1975 m

Mostra Tutte le Categorie

Tutta la posta in un unico posto

Calendario

Posta

Sereno

3° 11°

0°

Microsoft Edge

Roma

Anteprima Sk...

Tuneln Radio

Twitter

NETFLIX

Xbox

SODA

DISPONIBILE SU

Google play

Scarica da

App Store

Scarica da

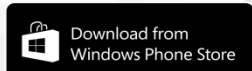
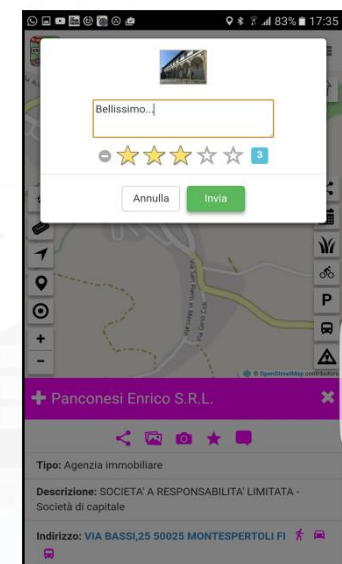
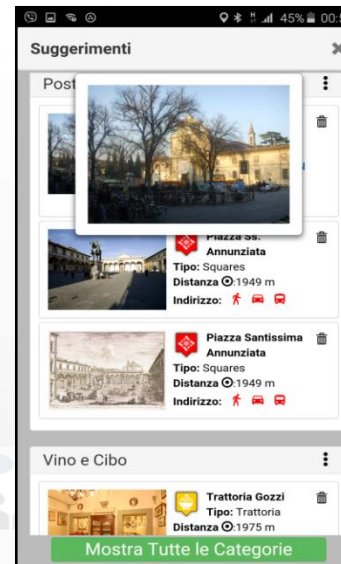
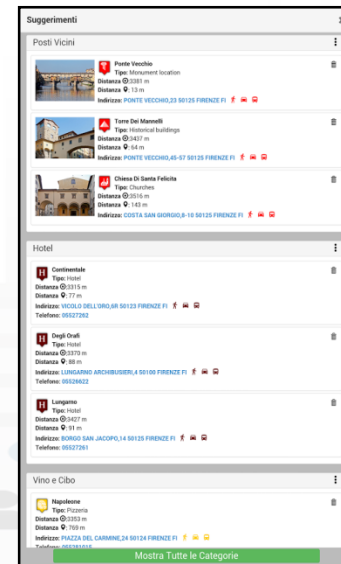
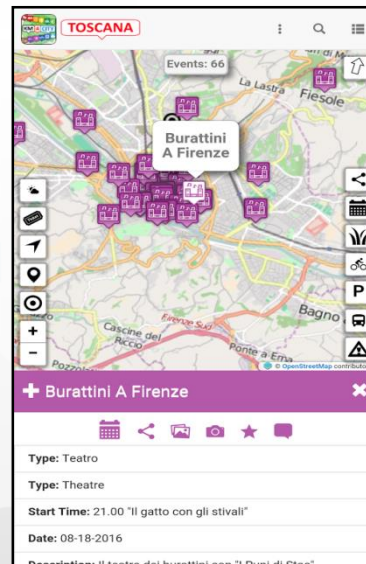
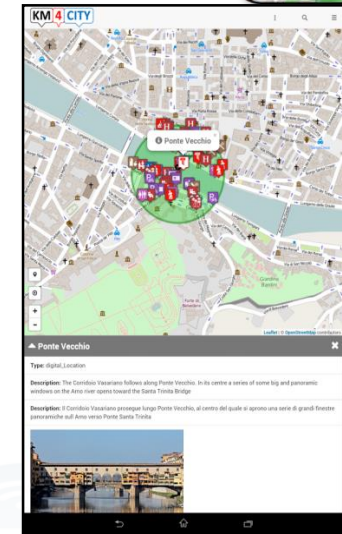
Windows Store



Km4City APP, features 1/3



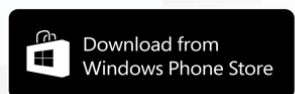
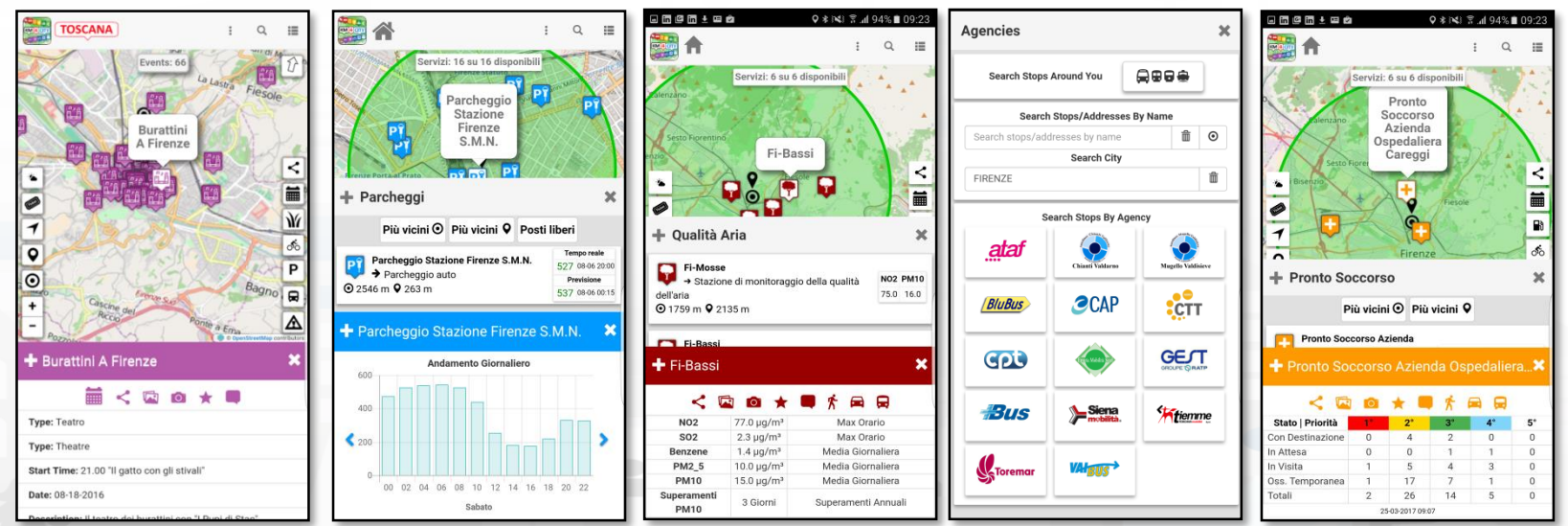
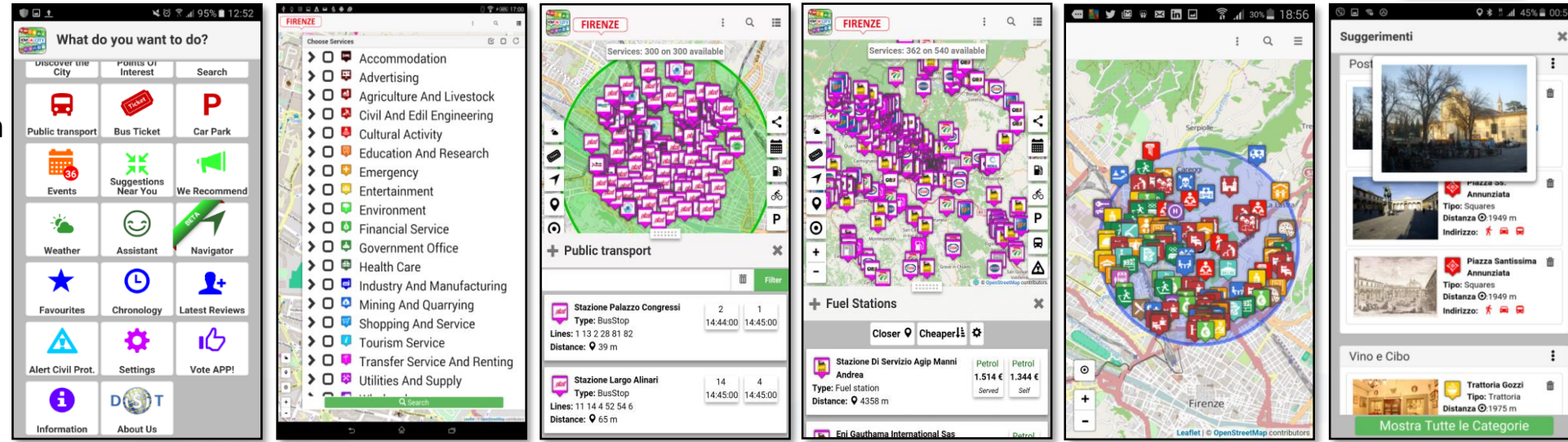
- **5 languages:** IT, EN, SP, DE, FR
- **Profiles** city users: Citizens, commuter, student, tourist, operator, etc..
- **Profiled Menu** per POI
 - adaptive
- **Main Menu: dynamic, and personalized**
- **Search Text**
- Search per POI
 - Near to you, near to a point, line...
- Other search
 - Close to you, events green areas, public transport, tickets , Cycling, parking,
 - Etc.
- POI
 - Preferred, Social icon
 - Ranking, Comments, images



Km4City APP



- Smart Parking, in Tuscany
- Smart First Aid in Tuscany
- Smart Public Transportation in Tuscany
- Smart Fuel pricing in Tuscany
- Bike Sharing
- Weather condition in Tuscany
- Pollution and Pollination in Tuscany
- Traffic Sensors in Tuscany
- Smart Routing in Tuscany
- Smart Transportation in Florence
 - Events, traffic, ...
- Entertainment Events in Florence



Km4City APP



- **Mobility**

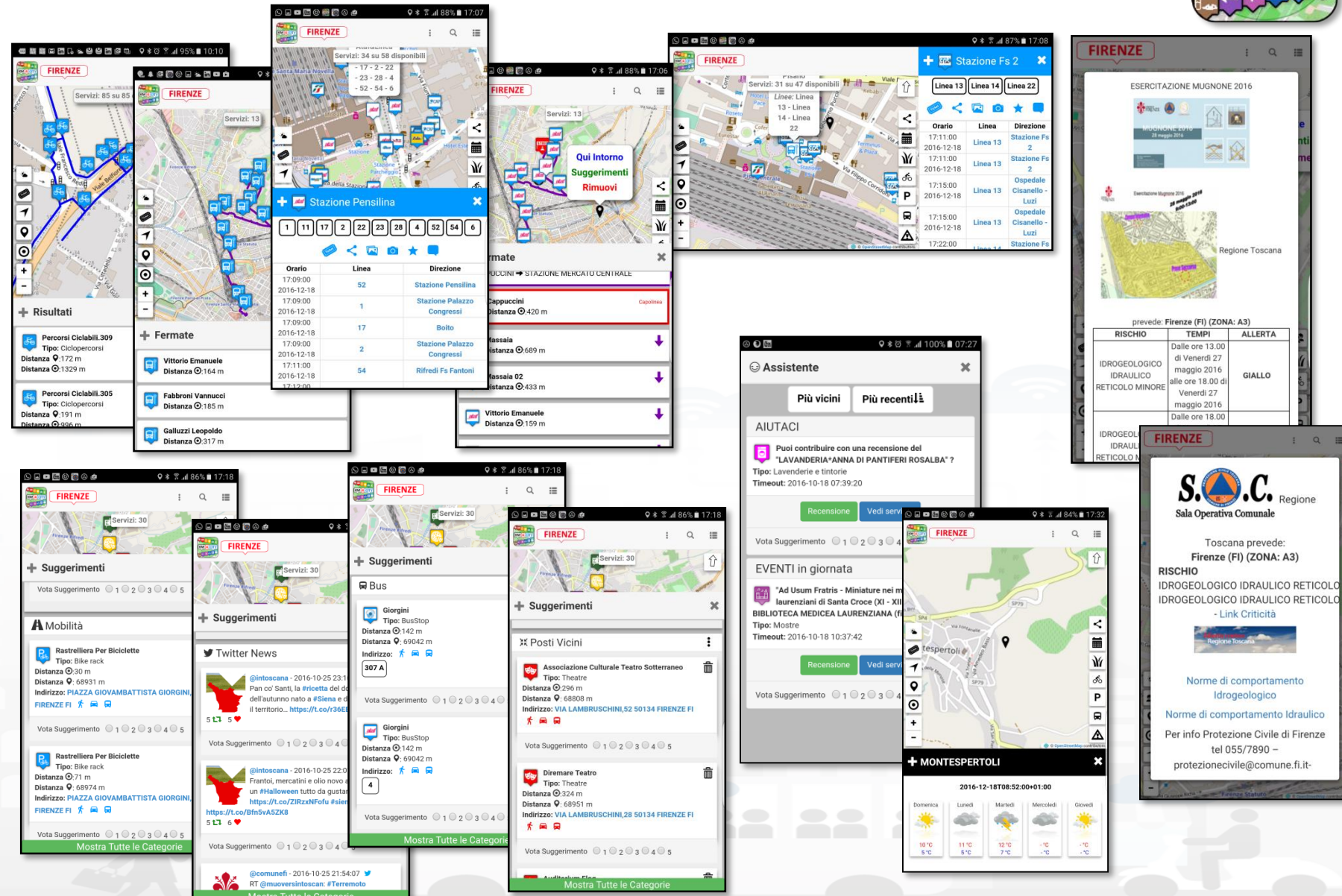
- Paths and stops, time
- Parking + prediction
- Ticketing
- Flow + prediction
- Navigation
- Connection with devices
- XXX Sharing

- **Personal Assistant**

- Info, Engagement
- Help, Civil protection

- **Suggestions:**

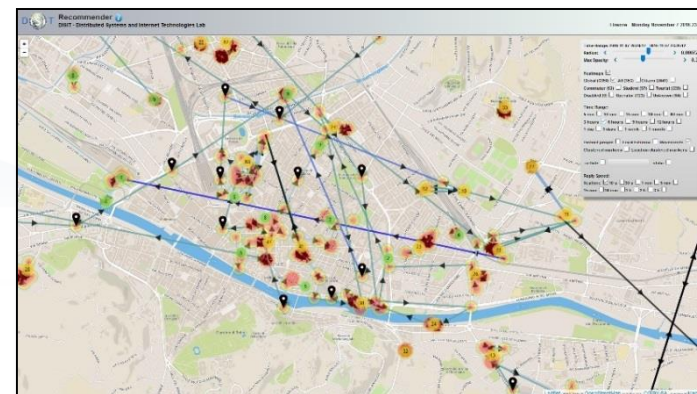
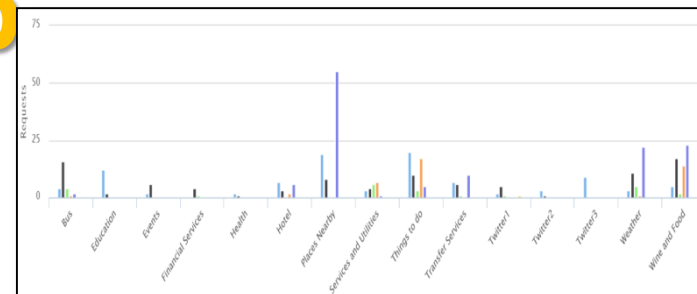
- Personalized and adaptive: banned e typed per city user.
- POI, Twitter, Events,
- Weather forecast,
- Civil Protection





Reasoning on App Data and for App

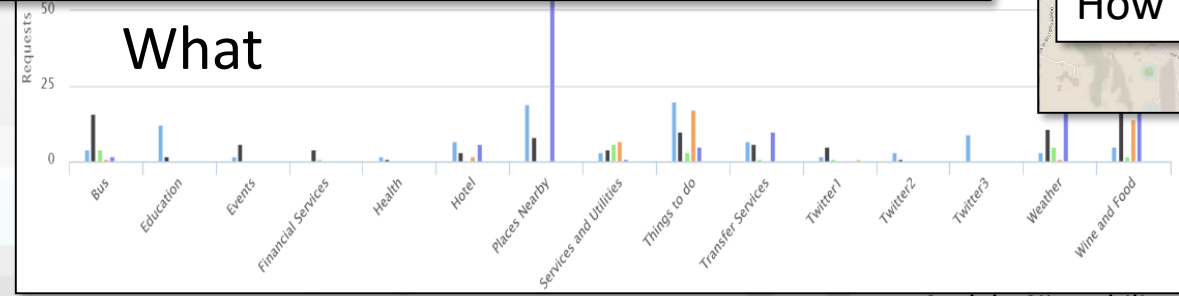
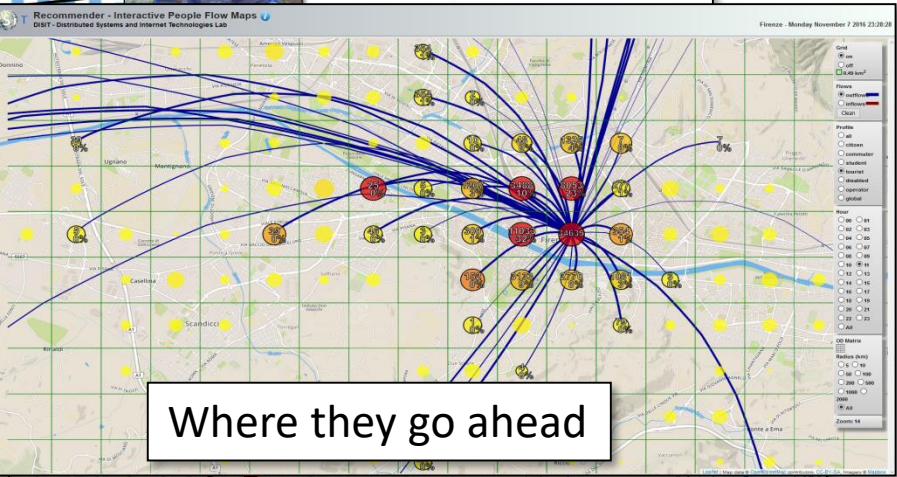
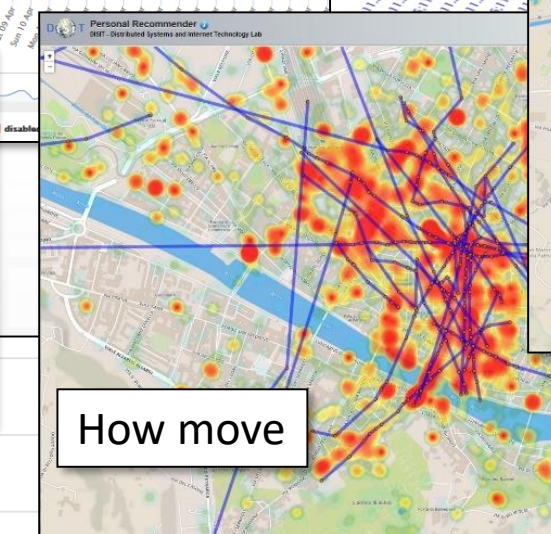
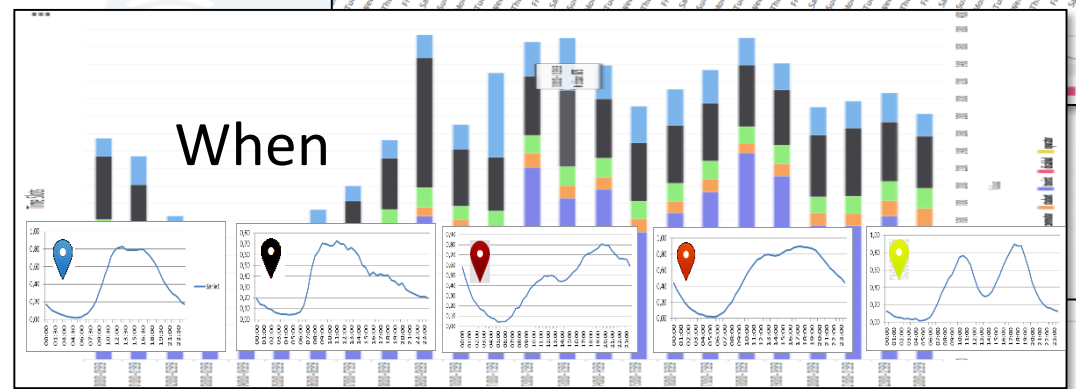
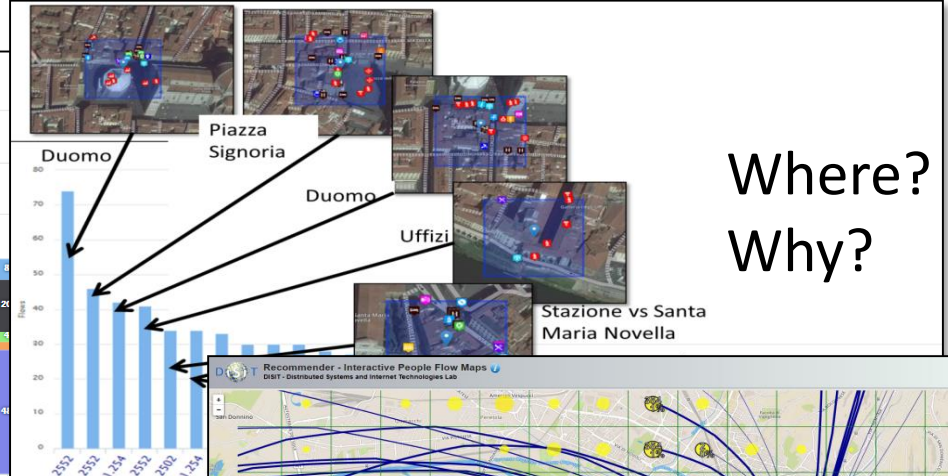
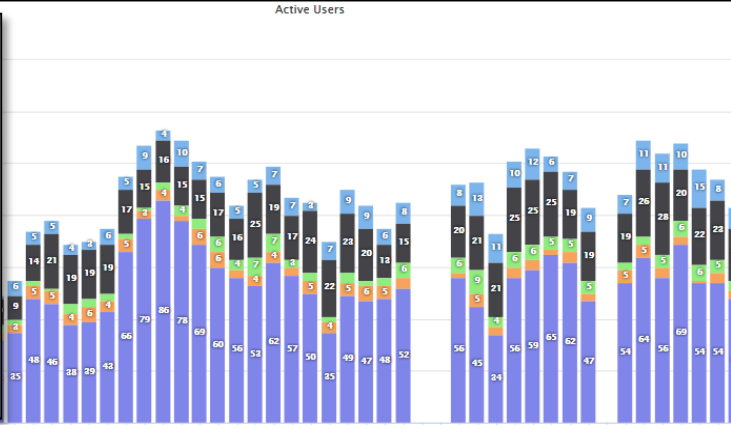
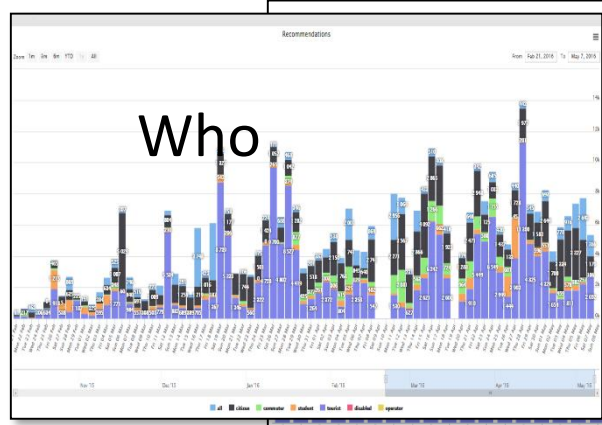
- **User behavior analysis**
 - engagement on demand
 - Reconstruction of user behavior on the move and in the city in general
 - Pedestrian, TPL, Bike, private, etc.
- **Production of Engagements....**
- **Suggestions...**
- **Routing....**

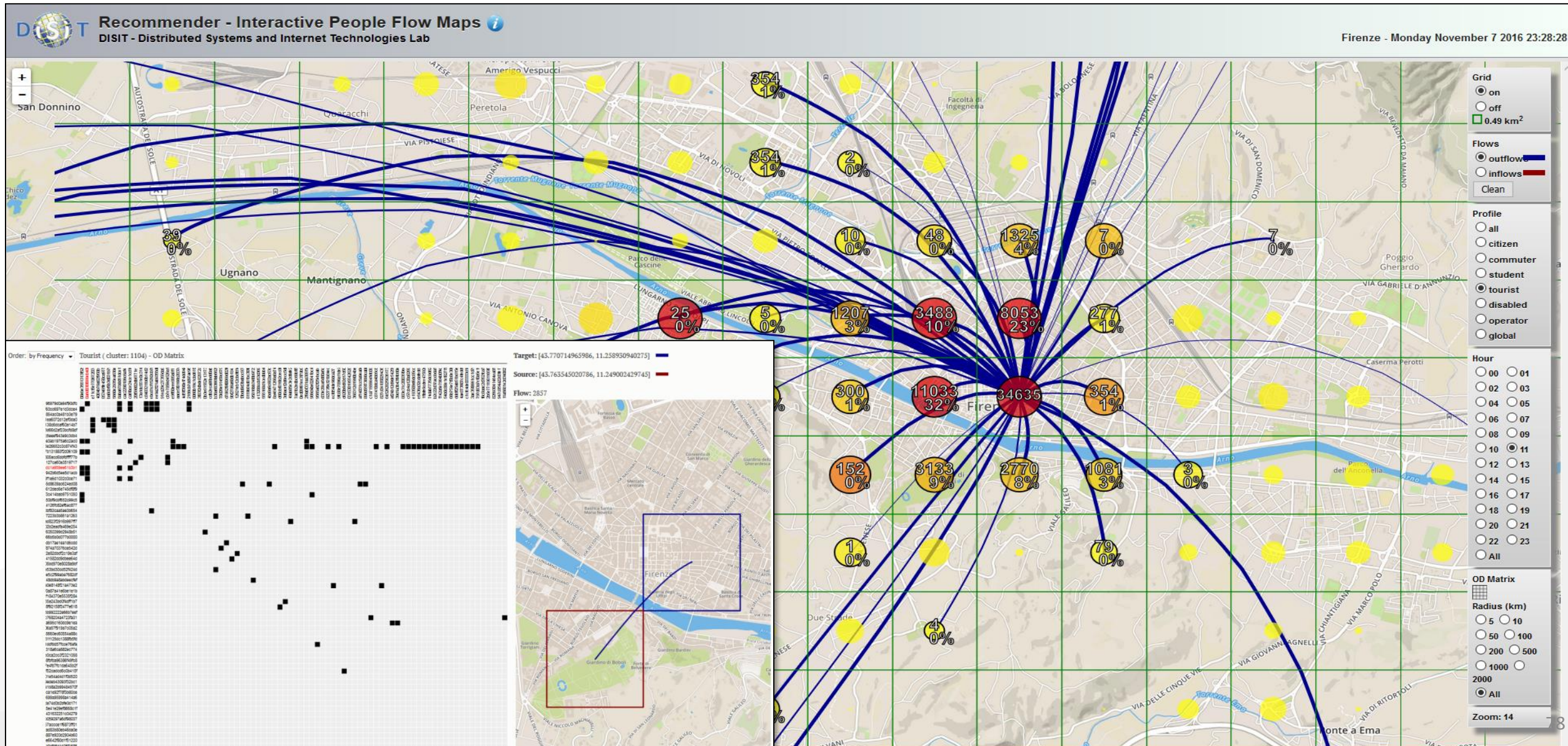


| Rule name | Type | #sent | #viewed | #viewed on #sent | Description |
|------------------|------------|--------------|--------------|------------------|---|
| daily_event_de | ENGAGEMENT | 1 (0%) | 0 (0%) | 0% | Suggest (in german) an event currently on in Florence |
| daily_event_en | ENGAGEMENT | 1720 (2.12%) | 70 (7.1%) | 4.07% | Suggest (in english) an event currently on in Florence |
| - commuter | | 5 (0.29%) | 0 (0%) | 0 (0%) | |
| - student | | 14 (0.81%) | 0 (0%) | 0 (0%) | |
| - tourist | | 1462 (85%) | 25 (35.71%) | 25 (1.71%) | |
| - citizen | | 113 (6.57%) | 39 (55.71%) | 39 (34.51%) | |
| - operator | | 0 (0%) | 0 (0%) | 0 (0%) | |
| - disabled | | 0 (0%) | 0 (0%) | 0 (0%) | |
| - all | | 119 (6.92%) | 6 (5.57%) | 6 (5.04%) | |
| daily_event_es | ENGAGEMENT | 6 (0.01%) | 4 (0.41%) | 66.67% | Suggest (in spanish) an event currently on in Florence |
| daily_event_fr | ENGAGEMENT | 6 (0.01%) | 0 (0%) | 0% | Suggest (in french) an event currently on in Florence |
| daily_event_it | ENGAGEMENT | 5459 (6.73%) | 296 (30.02%) | 5.42% | Suggest (in italian) an event currently on in Florence |
| parking_en | ASSISTANCE | 141 (0.17%) | 128 (12.98%) | 90.78% | Alert (in english) if the user parked in a residential parking zone |
| parking_es | ASSISTANCE | 3 (0%) | 3 (0.3%) | 100% | Alert (in spanish) if the user parked in a residential parking zone |
| parking_it | ASSISTANCE | 187 (0.23%) | 1 (0.1%) | 0.53% | Alert (in italian) if the user parked in a residential parking zone |
| shoot_a_photo_de | ENGAGEMENT | 68 (0.08%) | 1 (0.1%) | 1.47% | Ask (in german) a contribution for a nearby point-of-interest |



User Behavior Analyzer for Collective profiling





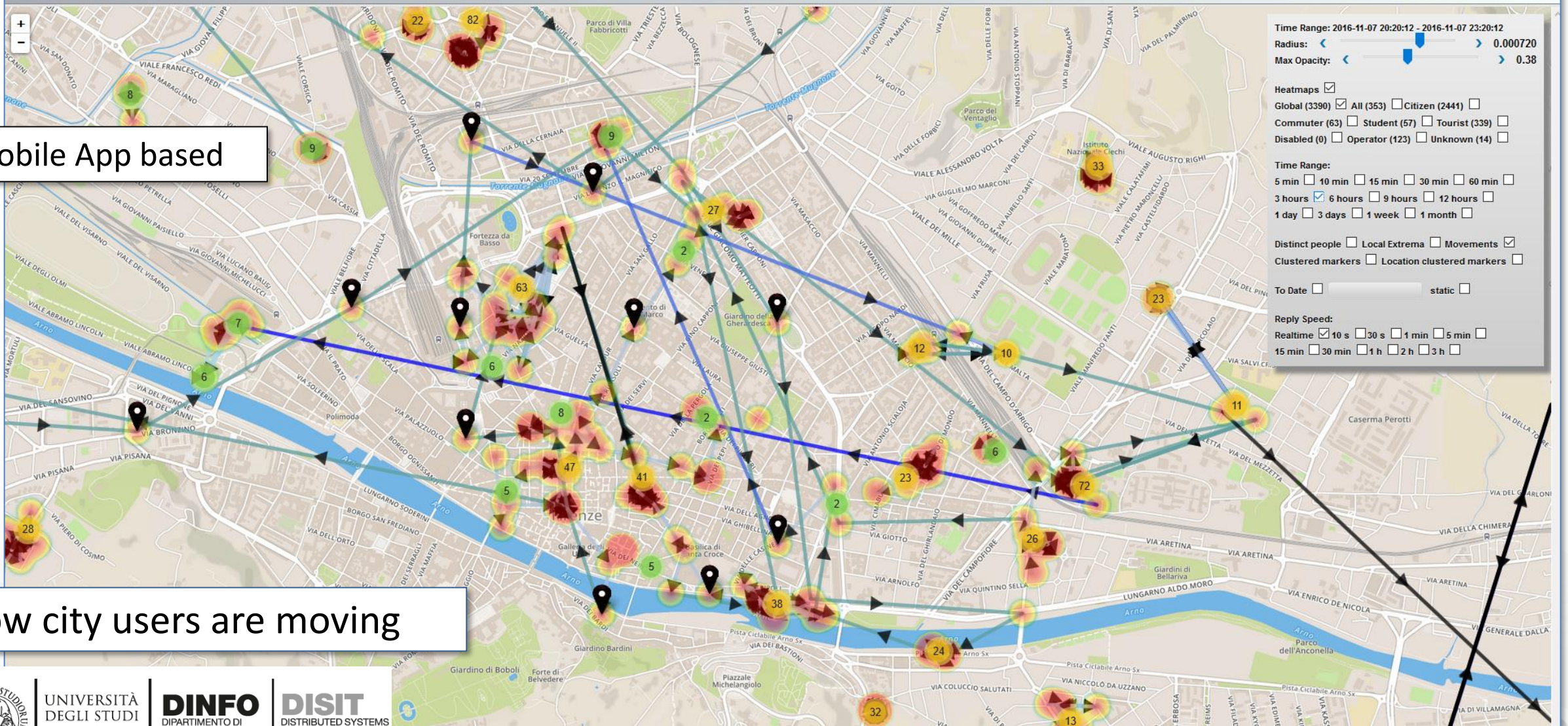
Anonymous User Behavior Analysis



DISIT Recommender
DISIT - Distributed Systems and Internet Technologies Lab

Firenze - Monday November 7 2016 23:20:15

Mobile App based



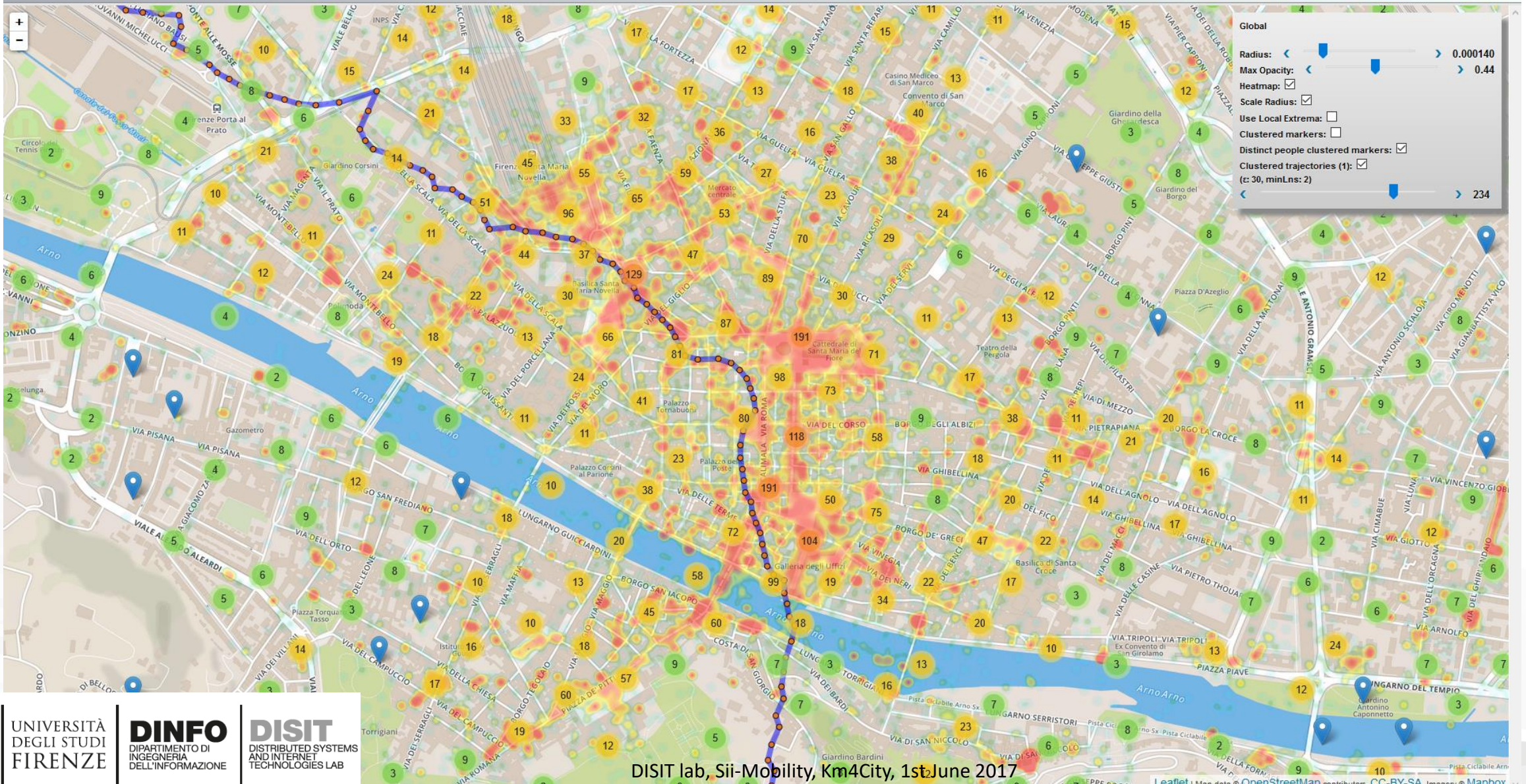
How city users are moving

Heat Map from Mobile: users as sensors



DISIT Recommender - Heatmap and Trajectories Clusters of City Users Together
DISIT - Distributed Systems and Internet Technologies Lab

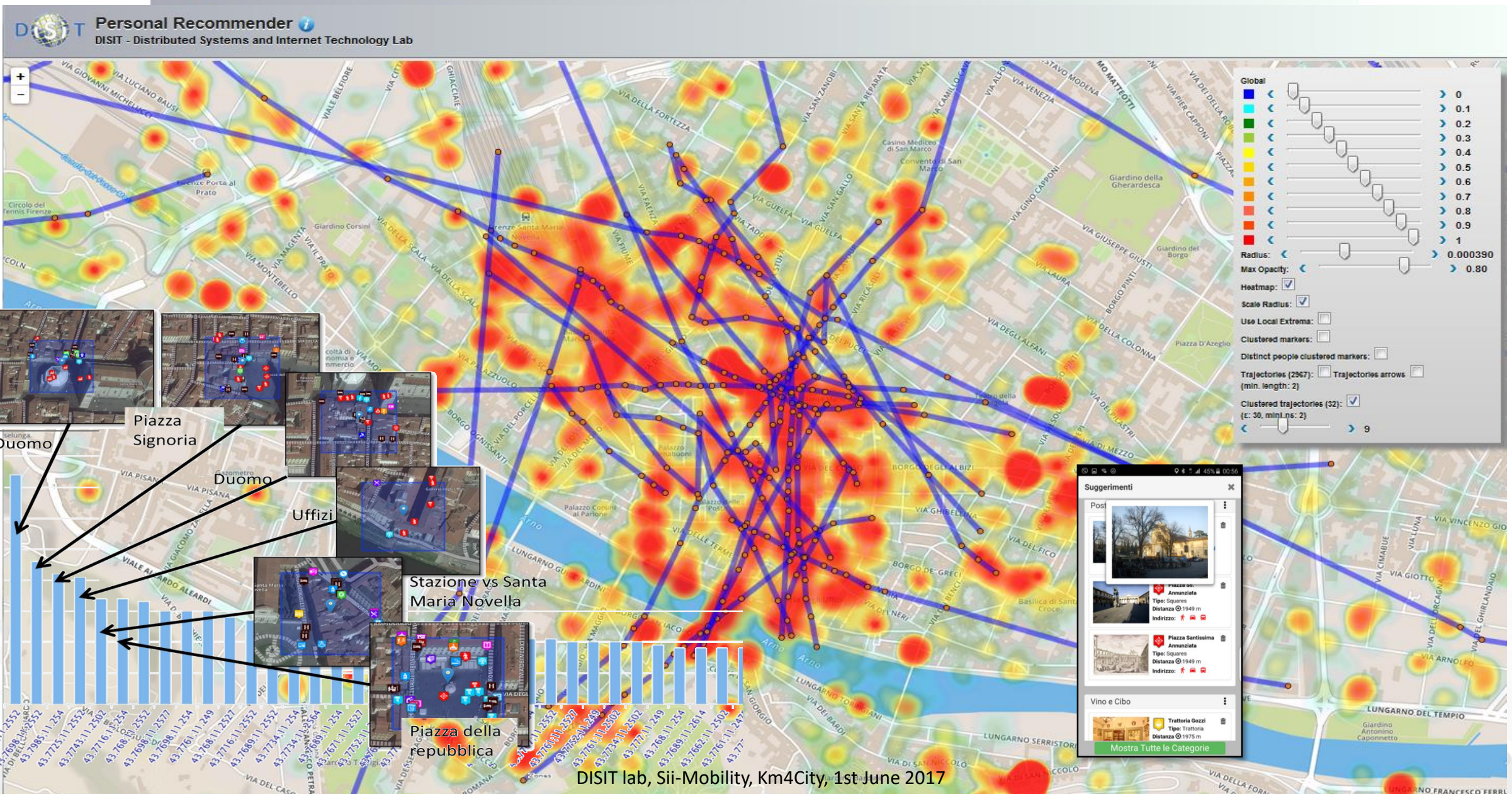
Firenze - Sunday January 8 2017 13:57:00



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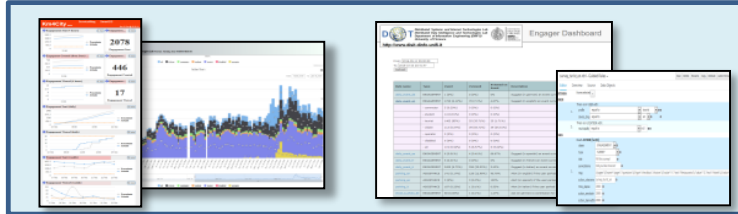
DINFO
DIPARTIMENTO DI
INGEGNERIA
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DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB

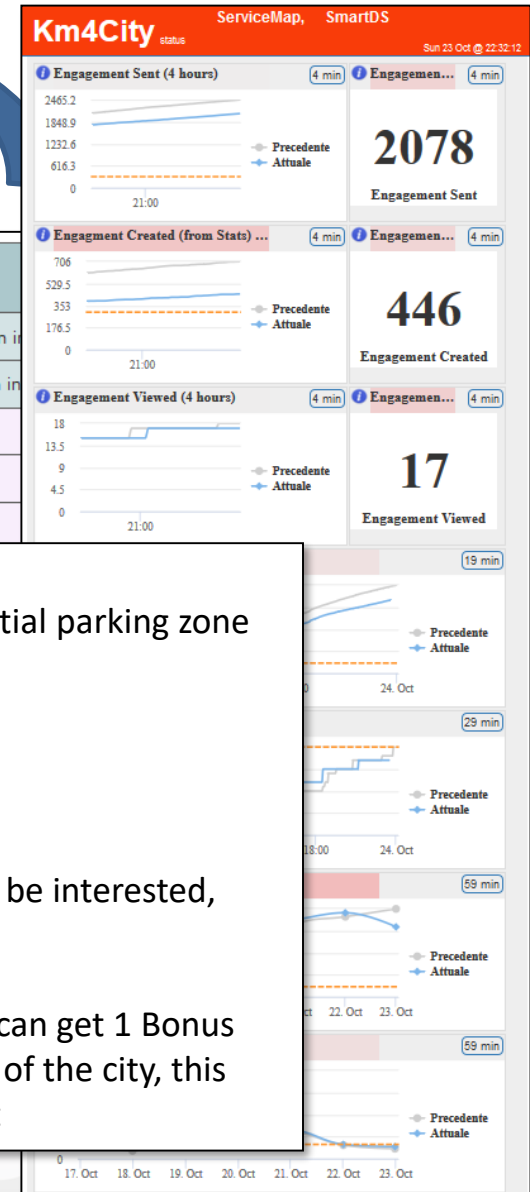


User influencing, engaging, monitoring & Follow Up

City & City Operators Strategy Editor



| Rule name | Type | #sent | #viewed | #viewed on #sent | Description |
|------------------|------------|--------------|-------------|------------------|--|
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| - disabled | | 0 (0%) | | | |
| - all | | 119 (6.92%) | | | |
| daily_event_es | ENGAGEMENT | 6 (0.01%) | | | |
| daily_event_fr | ENGAGEMENT | 6 (0.01%) | | | |
| daily_event_it | ENGAGEMENT | 5459 (6.73%) | | | |
| parking_en | ASSISTANCE | 141 (0.17%) | | | |
| parking_es | ASSISTANCE | 3 (0%) | | | |
| parking_it | ASSISTANCE | 187 (0.23%) | | | |
| shoot_a_photo_de | ENGAGEMENT | 68 (0.08%) | | | |



Any Mobile and Web App

Inform
 You have parked out of your residential parking zone
 The Road cleaning is this night
 The waste in S.Andreas Road is full

Engage
 Provide a comment, a score, etc..

Stimulate / recommend
 Events in the city, services your may be interested, etc..

Provide Bonus
 Since you have parked here you we can get 1 Bonus
 We suggest you to leave the car out of the city, this bonus can be used to by a bus ticket

Monitoring City users

Via Social Media

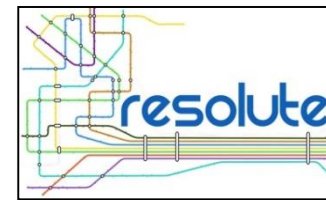
<http://www.km4city.org/?controlRoom>

<http://www.km4city.org/?devTools>

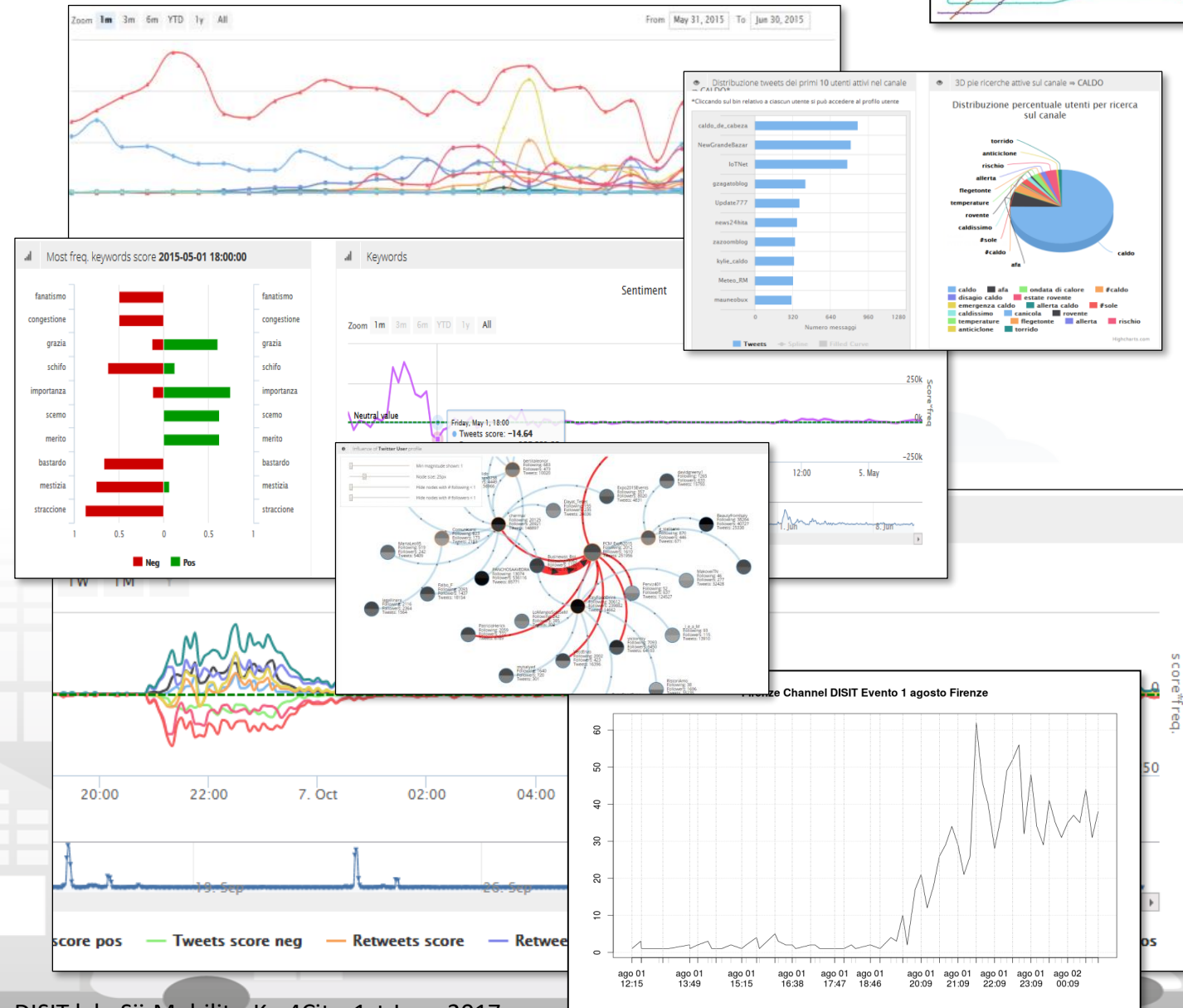
<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?app>

Twitter Vigilance



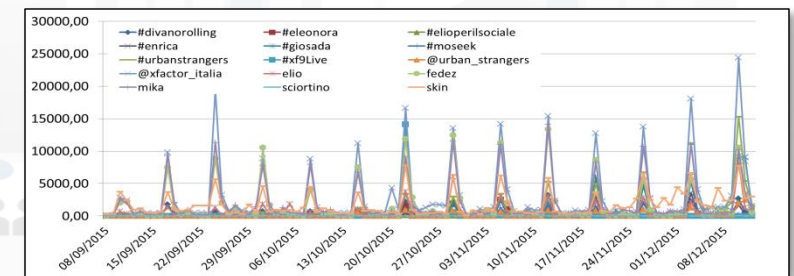
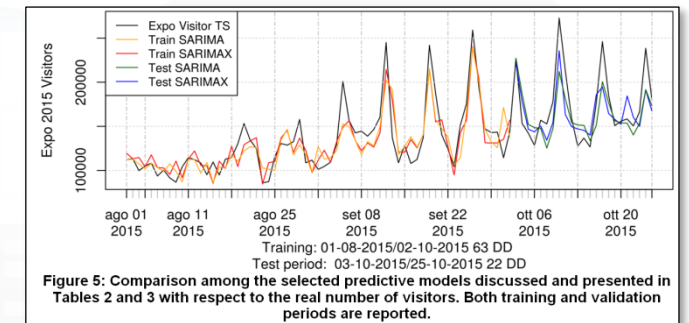
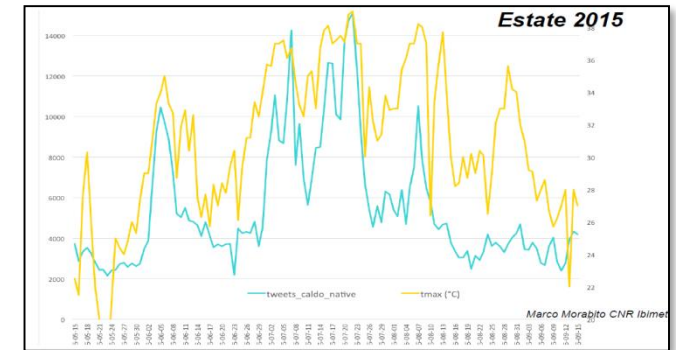
- <http://www.disit.org/tv>
- <http://www.disit.org/rttv>
- Citizens as sensors to
 - Assess sentiment on services, events, ...
 - Response of consumers wrt...
 - Early detection of critical conditions
 - Information channel
 - Opinion leaders
 - Communities
 - Formation
 - Predicting volume of visitors for tuning the services

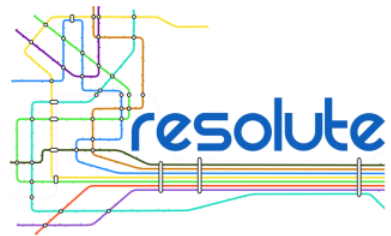


Twitter Vigilance

Prediction/Assessment

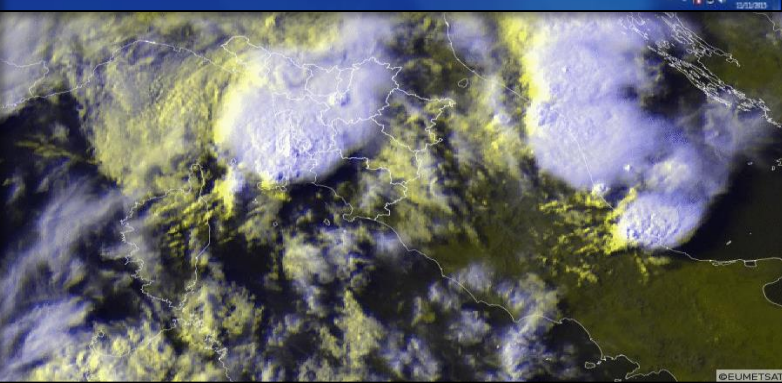
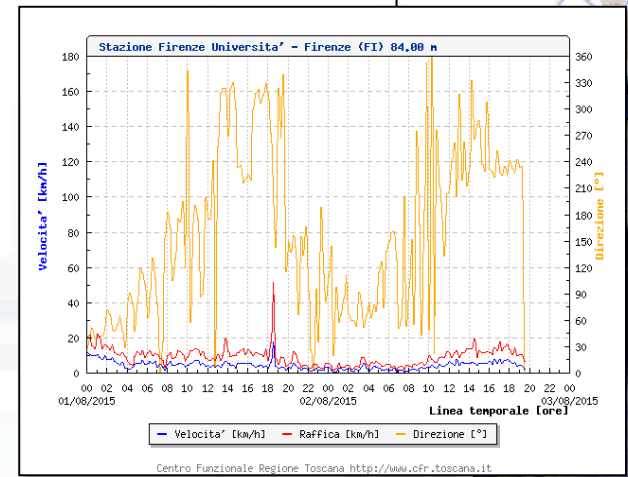
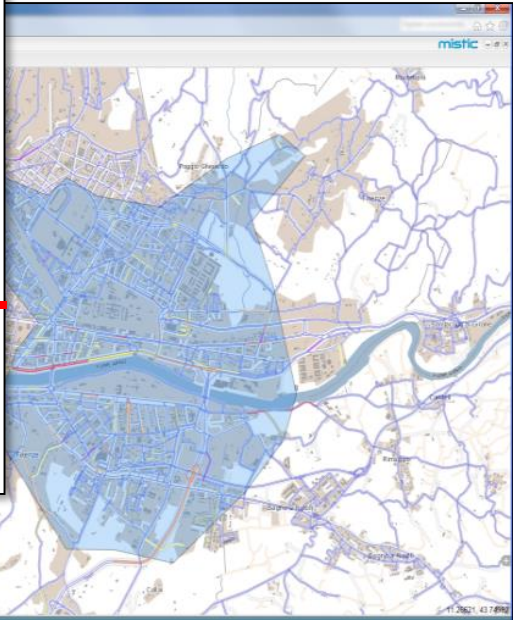
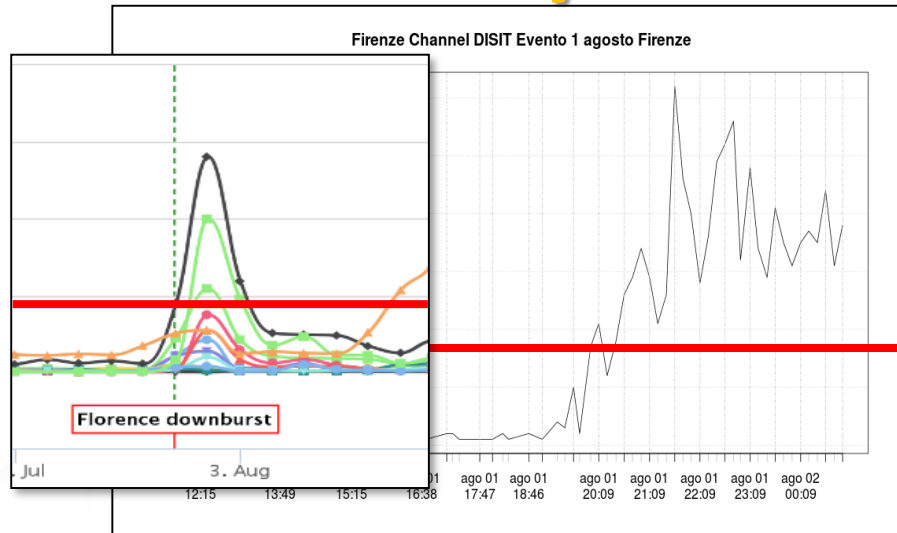
- Football game results as related to the volume of Tweets
- Number of votes on political elections, via sentiment analysis, SA
- Size and inception of contagious diseases
- marketability of consumer goods
- public health seasonal flu
- box-office revenues for movies
- places to be visited, most visited
- number of people in locations like airports
- audience of TV programmes, political TV shows
- weather forecast information
- Appreciation of services



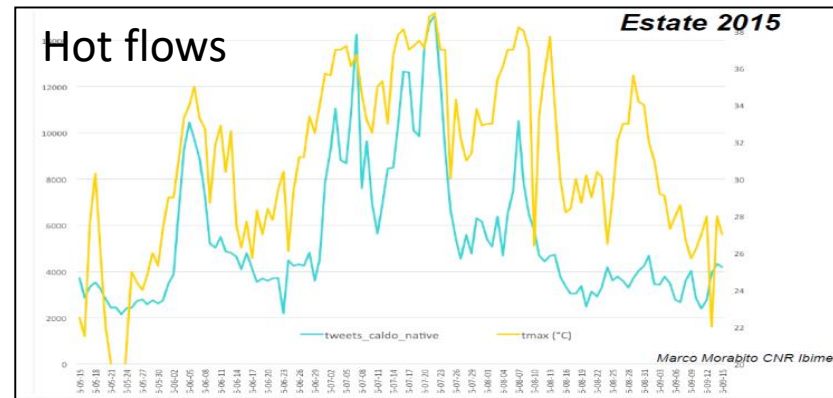


Twitter Vigilance

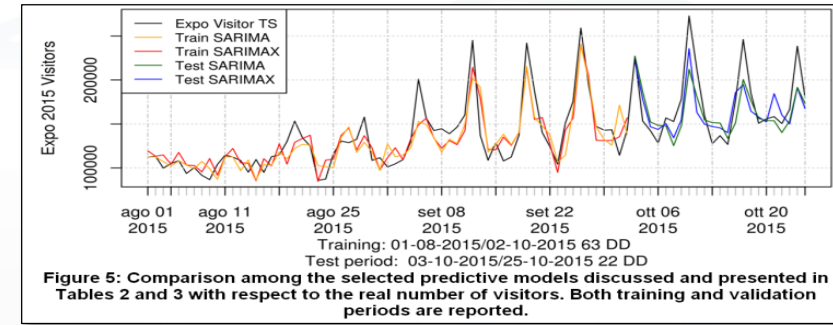
Early Warning



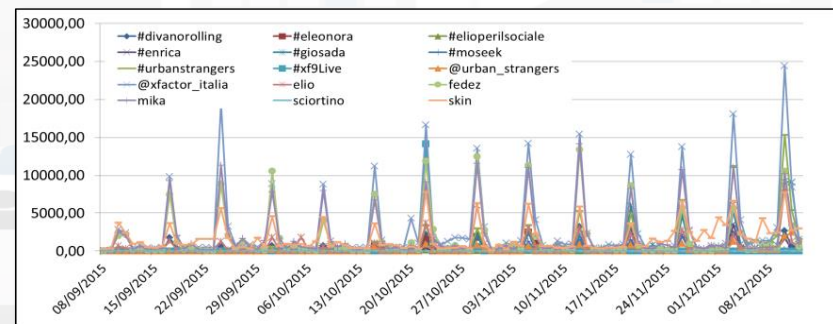
Predictive models



Attendance at long lasting events: EXPO2015



Attendance at recurrent events: TV, football



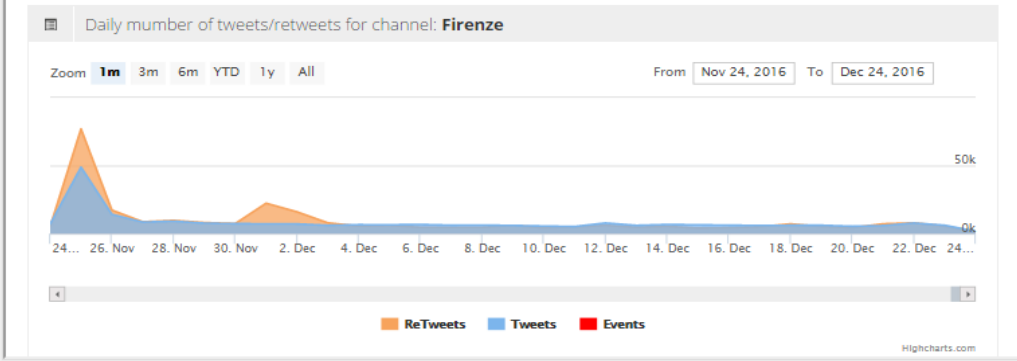
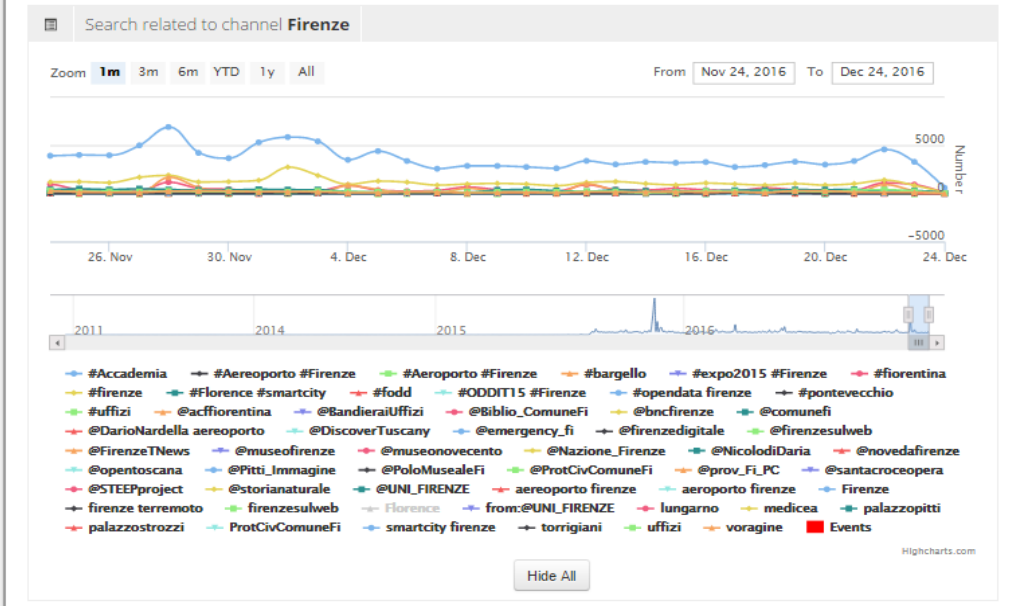
Twitter Vigilance su Firenze (sperimentale)

Twitter: Volume di Tweet tramite Twitter Vigilance

Twitter Vigilance Dashboard
Last crawling: 2016-12-24 12:34:51

Home > Channel statistics > Statistics on single Channel

Channel active from 2009-02-27 to today
Data processed from 2015-05-22 to 2016-12-02

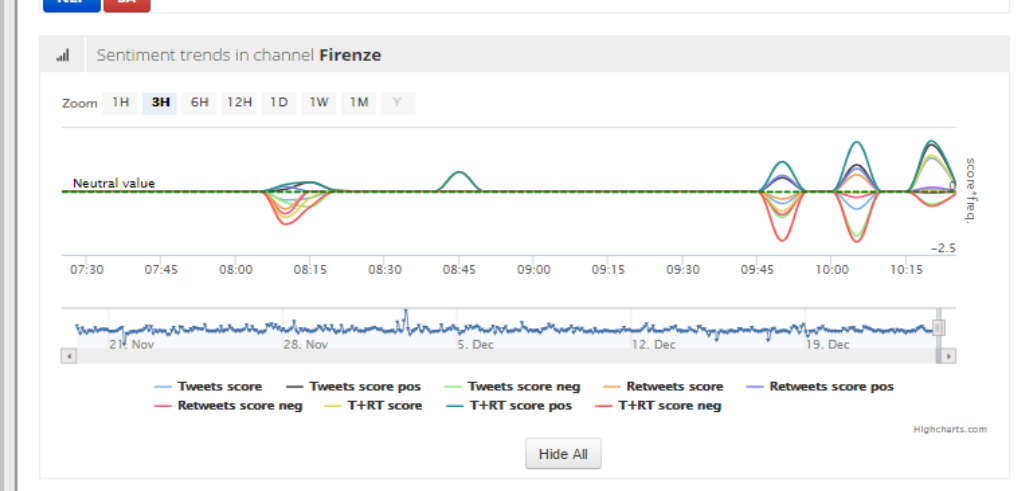


Sentiment Analysis in Tempo Reale su Firenze

Twitter Vigilance Real Time Dashboard
Last crawling: 2016-12-24 10:32:33

Home > Channel statistics > Channel sentiment analysis

Channel active from 2016-06-27 to 2016-12-24 10:30:00
Data processed from 2016-06-28 08:10:00 to 2016-12-24 10:25:00



Most Significant Tweets for Sentiment in the period

- @forealziesdayle - 2016-12-24 10:25:39
@Ahno_its_arno meh, I've only had average curry there
0 Retweets 0 Likes Sent. Score: 0.166667
- @esercizistorici - 2016-12-24 10:30:01
Stanotte Concerto di Natale di Peter Guth
@ORT_Toscana in collaborazione con Conservatorio 'L. Cherubini' di Firenze...
https://t.co/uFETp4wG1y
0 Retweets 0 Likes Sent. Score: 0
- @infoiterno - 2016-12-24 10:30:05
Firenze, un piano per un Natale sicuro (055firenze) https://t.co/vpqDASepi
https://t.co/2Bn5k3zoyv

Last tweets per channel Firenze

- @FormulaLatina - 2016-12-24 10:30:26
*** CAPODANNO LATINO Woodstock Club Firenze *** H. 21:00 >> GRAN BUFFET DI SAN SILVESTRO CON BRINDISI E...
https://t.co/cM84Gw65s0
0 Retweets 0 Likes
- @MORINEMMANUELL2 - 2016-12-24 10:30:14
RT @Navymat: Francesco #Salvati Carità,1543 #Manierisme Galleria degli Uffizi, Firenze @ChevernyM @mariaireneali @pieroBENEDETTO @Giusepp...
6 Retweets 0 Likes
- @infoiterno - 2016-12-24 10:30:12

Twitter Citazioni

TRENDS QUOTES

- @NICOLODIDARIA
- @COMUNEFI
- @ACFFIORENTINA
- @NAZIONE_FIRENZE
- @SANTACROCEOPERA
- @MUSEONOVECENTO
- @FIRENZEDIGITALE

Twitter Hashtag trend

TRENDS QUOTES

- #FIRENZE
- #FIORENTINA
- #UFFIZI
- #PONTEVECCHIO

We suggest to use Chrome browser for better experience

Development Tools

<http://www.km4city.org/?controlRoom>

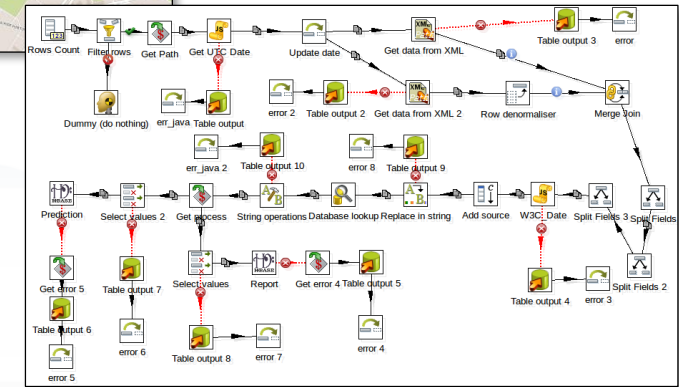
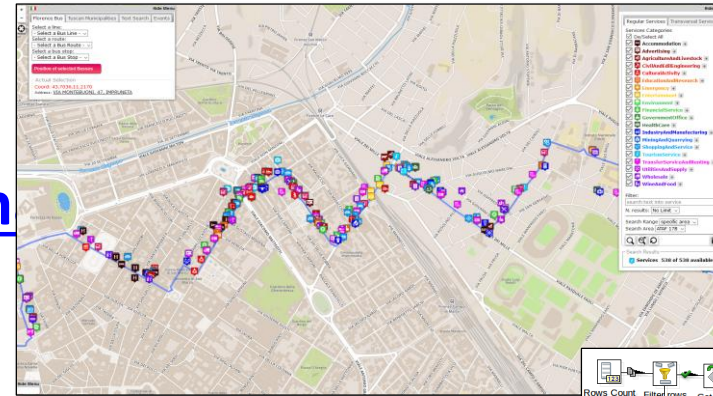
<http://www.km4city.org/?devTools>

<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?app>



- **Smart City API:**
 - Several kind of APIs
- **Generator “ServiceMap”, <http://servicemap.com>**
 - Call per web and mobile App
 - Embedding in web pages
 - *Collaborative work*
- **Load new data: manual and automatic**
 - POI, IOT, etc.
 - Load of Shape & Paths
 - *Collaborative work*
- **Dashboard builder**
 - Production of dashboard per control room
 - Embedding view of any other analytics of Km4City or of third party: wifi, 3D, flow, recommend, engager, etc.
 - *Collaborative work*



Higher level Dashboard



Energy (demo)

ServiceMap, SmartDS

Q1 Q2 Q3 Q4 Q5

Active wind turbines: 57.6%

Charging column map

City consumption: GW 0

Free charging slots: cols 17

Active solar panels: 81.6%

Turisti attivi (12 ore): 34

Uffici attivi (12 ore): 77

City consumption trend

Free bike...

Energy...

Firenze

43.7693, 11.2560

ServiceMap, SmartDS

Tue 4 Oct @ 12:18:04

Wi-Fi operativi: 100%

Numero di processi lanciati: 2676

CPU in uso: 24.2%

Memoria in uso: 0%

SmartDS: via Santa Marta 3

Smart City Engine

Real time position ATAF bus

Stato linee ATAF

Linee: 6, 17, 4

in Orario: 46.2%

in Anticipo: 4.6%

in Ritardo: 49.2%

Twitter Vigilance

Firenze Wi-Fi: APs Streaming Realtime

DISIT - Distributed Systems and Internet Technologies Lab

Firenze - Tuesday October 4 2016 13:18:05

Time Range: 2016-10-04 13:03:00 - 2016-10-04 13:18:00

Radius: 0.0008

Max Opacity: 0.80

Heatmap (2865) Streaming APs

Time Range: 5 min 10 min 15 min 30 min 60 min 2 hours 6 hours 9 hours 12 hours 1 day 3 days 1 week 1 month

Distinct people Local Extrema Clustered markers

To Date static

Reply Speed: Realtime 10 s 30 s 1 min 5 min 15 min 30 min 1 h 2 h 3 h

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

Mugnone 2016

Real time position ATAF bus

Stato linee ATAF

Linee: 6, 17, 4

in Orario: 46.2%

in Anticipo: 4.6%

in Ritardo: 49.2%

Twitter Vigilance

Recommender - Heatmap and Trajectories Clusters (User Profile: All)

DISIT - Distributed Systems and Internet Technologies Lab

Firenze - Tuesday October 4 2016 13:18:05

Radius: 0.000510

Max Opacity: 0.46

Scale Radius: 1

Use Local Extrema: 1

Clustered markers: 1

Distinct people clustered markers: 1

Clustered trajectories (15) (0.36 min max 2)

Leaflet | Map data © OpenStreetMap contributors, CC-BY-SA, Imagery © Mapbox

Twitter Vigilance Dashboard

DISIT - Distributed Systems and Internet Technologies Lab

Department of Information Engineering (DISIT) University of Florence

Twitter Vigilance Dashboard

Last crawling: 2016-10-04 13:16:53

Home > Channel statistics > Channel sentiment analysis

Channel active from 2009-12-06 to today

Data processed from 2015-09-09 to 2016-01-21

NLP SA

Sentiment trends in channel uber

Zoom 1m 3m 6m YTD 1y All

Tweets score Tweets score pos Tweets score neg Retweets score Retweets score pos Retweets score neg T+RT score

Hide All

SmartCity Processes

Fri 4 Nov @ 18:51:20

| | | | | | |
|----------------------------|--------------------------|----------------------------|---------------------------|-----------------------------|-------------------------|
| ATAF | ATAF | ATAF | ATAF | CHECK RT | EVENTI FI |
| amr_lineaT1_3 | amr_lineaT1_3 | amr_lineaT1_3 | amr_lineaT1_3 | check_rt | eventi_firenze_3 |
| RUNNING | RUNNING | SUCCESS | SUCCESS | SUCCESS | SUCCESS |
| PARK | PARK | PARK | PARK | PARK | PARK |
| parcagg1_3 | parcagg1_3 | parcagg1_3 | parcagg1_3 | parcagg1_3 | parcagg1_3 |
| FAILED | SUCCESS | SUCCESS | SUCCESS | SUCCESS | SUCCESS |
| METEO | METEO | METEO | METEO | METEO | METEO |
| previ_meteo_Abbatone_xm1_3 | previ_meteo_Arazzo_xm1_3 | previ_meteo_Firacole_xm1_3 | previ_meteo_Firenze_xm1_3 | previ_meteo_Impruneta_xm1_3 | previ_meteo_Lucca_xm1_3 |
| SUCCESS | SUCCESS | SUCCESS | SUCCESS | SUCCESS | SUCCESS |
| SENSORI | SENSORI | SENSORI | SENSORI | SENSORI | SENSORI |
| sensoridiametro | sensor_ARZZO_3 | sensor_EMPOL_3 | sensor_PISA_3 | sensor_FIRENZE_3 | sensor_PRATO_3 |
| SUCCESS | SUCCESS | SUCCESS | SUCCESS | SUCCESS | SUCCESS |
| TWITTER | TWITTER | FI WIFI | FI WIFI | FI WIFI | FI WIFI |
| tweetTweetsRecommender | TwitterVigilanceIndexing | calcolaAPATimeSeries | calcolaNewUsers | calcolaUsersStatus | GraphsJGenerator |
| SUCCESS | RUNNING | RUNNING | SUCCESS | SUCCESS | FAILED |

Twitter Vigilance



Dashboard Builder

<http://www.disit.org/6935>



Dashboard Builder

Admin Logout

Operations

Metrics

Widgets

Users

Dashboards Overview

| Name | Title | Creation Date | Status |
|------|-----------------|---------------------|--------|
| 12 | Dashboard Galia | 2016-07-27 11:35:15 | |

My Dashboard

A - 01

Copia 59

Copia Duplicazione Dashboard

CopiaAdminDash

CopiaDashAttuale

dashboard creata

DASHBOARD DUPLICATA 41

DashobarAdmin

Menu_dash

nuova Copia

nuova Copia01

Nuova Dashboard

NUOVA DASHBOARD 40

Sources Management

Operations

Dashboard Builder

metrics

widgets

DataSources Overview

| ID | URI |
|---------------------|--|
| Km4CityApp | jdbc:mysql://fedislog:3306 |
| Km4Cityquartz | jdbc:mysql://192.168.0.20:3306 |
| Km4CityRDF | http://192.168.0.208:8080/WebApp/Grafico?spanl |
| Km4CityRecommender | jdbc:mysql://192.168.0.55:3306 |
| Km4CityServiceMap | jdbc:mysql://192.168.0.72:3306 |
| Km4CitySillmobility | jdbc:mysql://192.168.0.72:3306 |
| prova | jdbc:mysql://fedislog:3306 |
| SmartDS | jdbc:mysql://192.168.0.25:3306 |
| TwitterTv | jdbc:mysql://192.168.0.50:3306 |

Add new Widget

Click the Add button to add one or more metrics to the widget

Metric: Sensors_RT

Metric Description: Description: Percentage of Edge Sensors Active
Metric: CPUload
Data Area: Mobilita
Data Source: Osservatorio Regionale per la Mobilita ed i Trasporti
Refresh rate: 60 sec
Status: Active

Context: [Dropdown]

Type Widget: widgetPieChart (max 1 metrics)

Selected Metrics: Sensors_RT

Link: www.km4city.wif_operative.it

Information: Percentage of road sensors (underground only) working or not compared to those declared in the day. The portion of the graph in red refers to the percentage of non-functioning, the green part refers to the active ones.

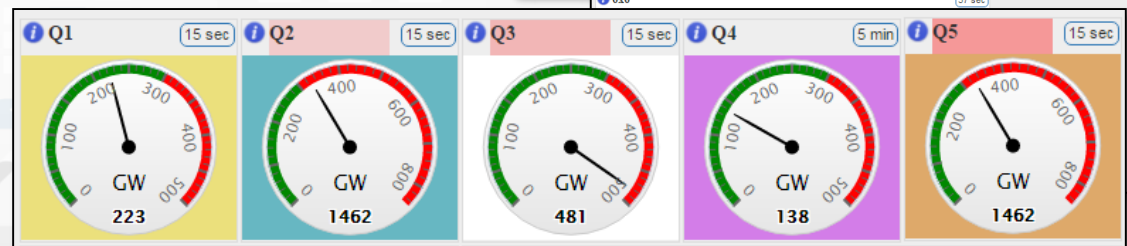
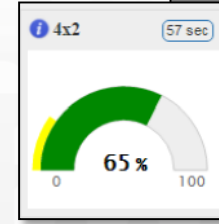
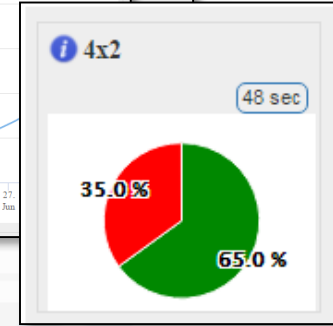
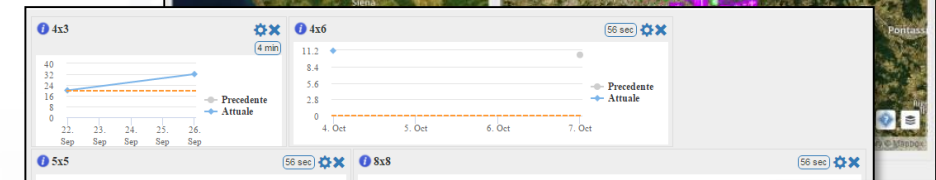
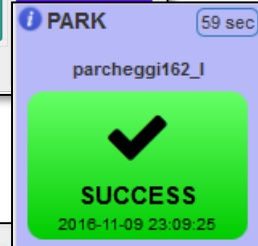
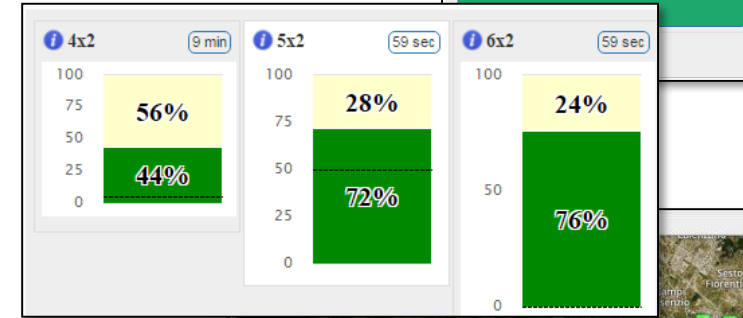
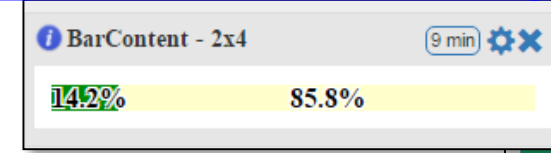
Widget Parameters

Title: Sensors RT Background color: amrr

Time Interval: No Refresh rate (sec): 60

Rows number: 2 Columns number: 3

Buttons: Reset, Close, Create



Modifica Widget

Id Widget: widgetBarContent

Type: Percentuale

Min. Columns number: 1 Max. Columns number: 2

Min. Rows number: 2 Max. Rows number: 3

n. metrics: 1 Color: 1

Buttons: Close, Modify

Transport systems
Mobility, parking



Public Services
Govern, events, ...



Sensors, IOT
Cameras, ..



Environment,
Water, energy



Shops, services,
operators

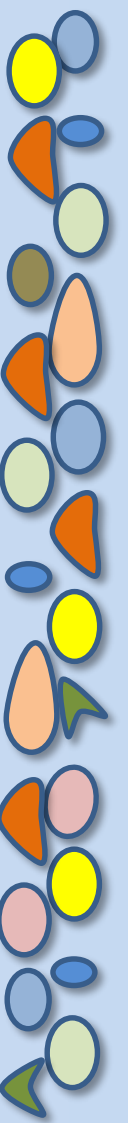


Social Media
WiFi, network

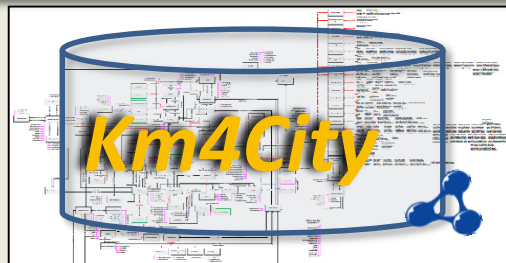


Static, Slow and Real Time data flows

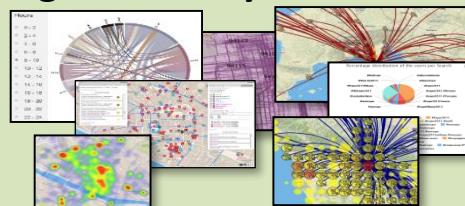
DISCES -- Distributed and parallel architecture on Cloud



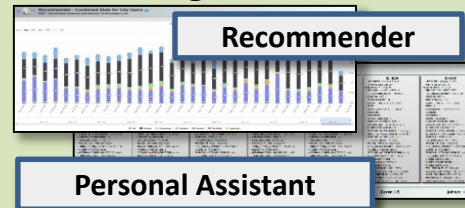
Km4City Smart City Engine



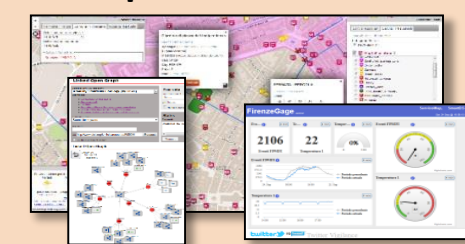
Big Data Analytics



Smartening Tools



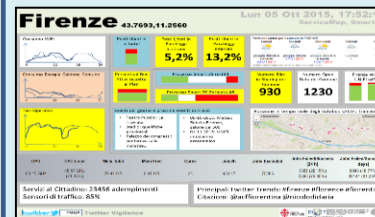
Development Tools



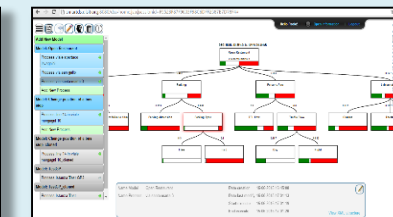
Km4City Smart City API

City Operators and Decision Makers

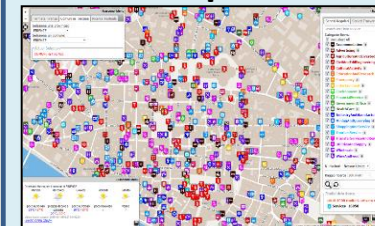
Dashboards



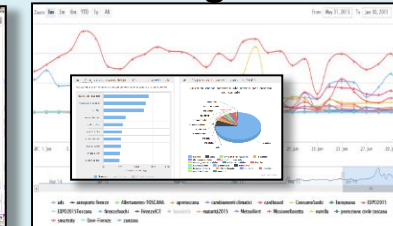
Smart Decision Support



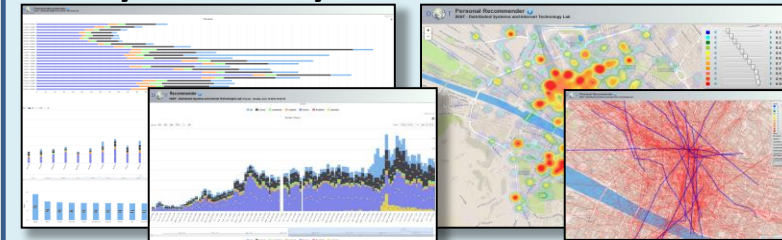
ServiceMap browser



Twitter Vigilance

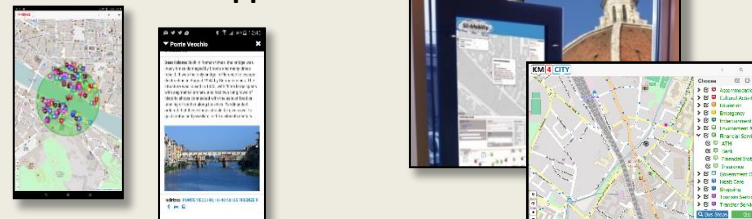


Analizers of City User Behavior



Tools for Final Users

Mobile e Web Apps



Caricare nuovi dati

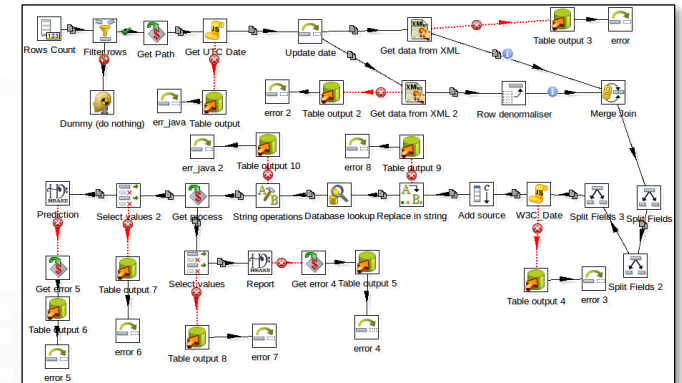
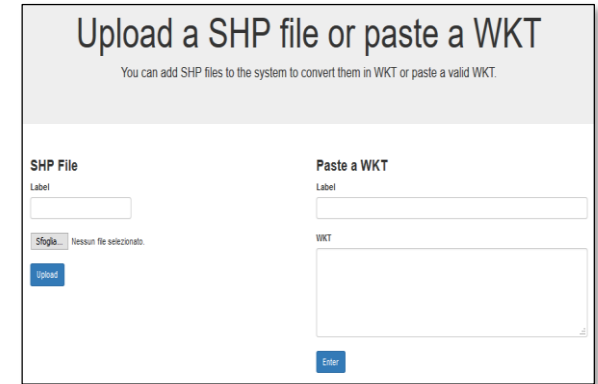
- **Dati Statici e Sporadici, caricamento:**

- Manuale a partire da:
 - tabelle in CSV; forme: SHP, WKT
- Automatico da tutti i formati:
 - SHP, CSV, KLM, XML, JSON, db, xls, txt, triple, etc.

- **Dati dinamici, caricamento automatico:**

- Programmato con scheduler DISCES
- Processi in ETL o Java o C o Python
- Tipicamente: Ingestion (ETL), quality improvement (ETL), mapping (KARMA)

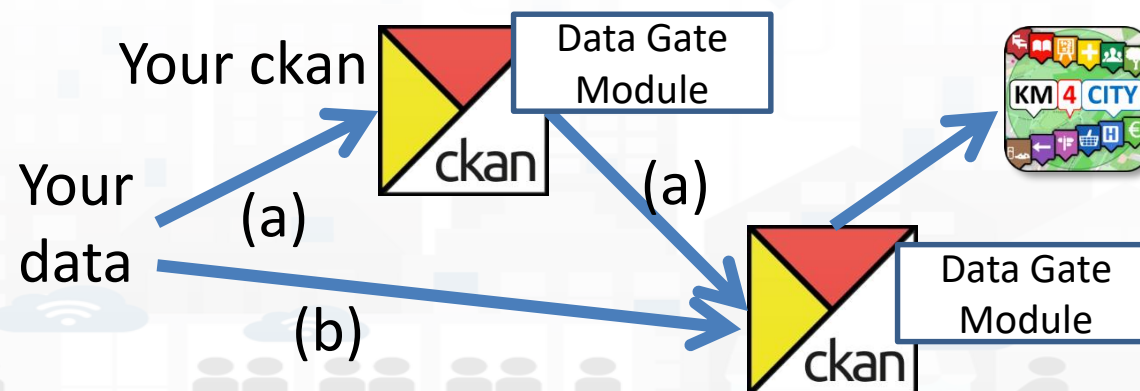
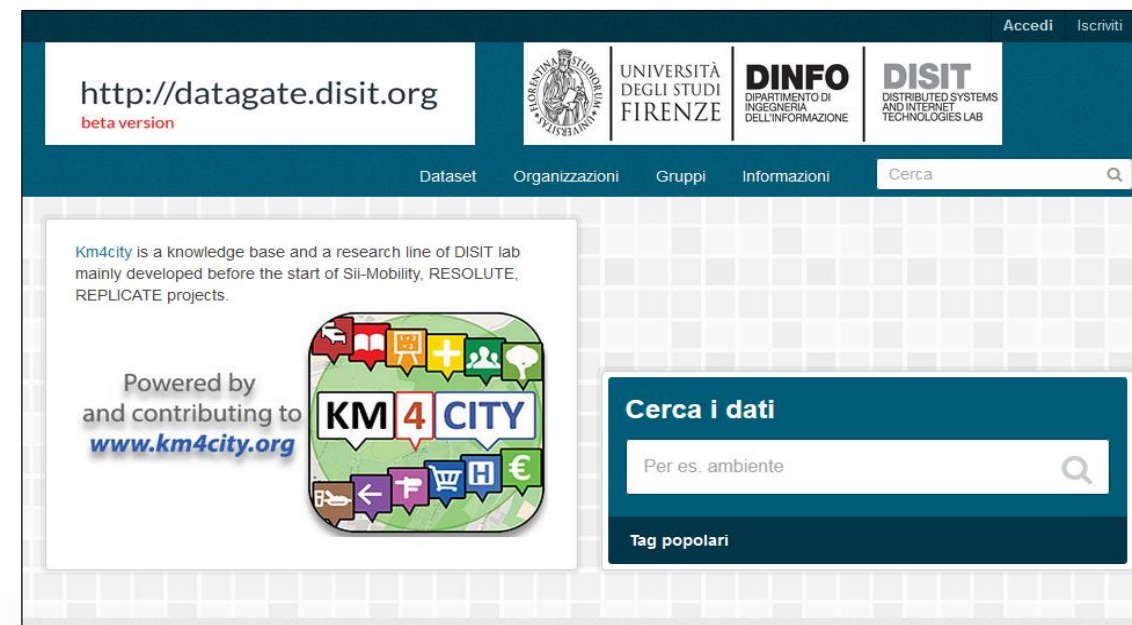
- **Procedure «open source»** accessibili come esempi e come sistema di sviluppo **si veda tutorial** del Luglio 2016: <http://www.disit.org/6690>





DISIT DataGate

- To load new data into Km4City model in short time ..
 - Upload your CSV, XLS, XLSX directly on our CKAN DataGate.
- DataGate allows you
 - fastening the data ingestion, from your CKAN to our model
 - formatting and improving your data, assisting you in the process



<http://DataGate.disit.org>

Loading Shapes and Paths for search

<https://arthur-e.github.io/Wicket/sandbox-gmaps3.html>

<http://www.km4city.org/wkt/>

Wicket

Wicket is a lightweight Javascript library that reads and writes Well-Known Text (WKT) strings. It can also be extended to parse and to create geometric objects from various mapping frameworks, such as Leaflet, the ESRI ArcGIS JavaScript API, and the Google Maps API.

```
MULTIPOLYGON (((40 40, 20 45, 45 30, 40 40)), ((20 35, 10 30, 10 10, 30 5, 45 20, 20 35)), (30 20, 20 15, 20 25, 30 20)))
```

Format for URLs

Design © 2012-2013 K. Arthur Endsley
Wicket is released under the GPL v3

Upload a SHP file or paste a WKT

You can add SHP files to the system to convert them in WKT or paste a valid WKT.

SHP File

Label

Nessun file selezionato.

Paste a WKT

Label

WKT

ServiceMap Dev Tool

Search around a GPS point

Search along a line

Regular Services | Transversal Services

search text into service

Services Categories

- Area
- DigitalLocation
- HappeningNow
- Park
- Fresh Place
- Public Transport Line
- Road Sensors
- Bus Stops

N. results for each: 200

Search Range: 500 mt

Search Results:

- Services: 35 of 35 available
- Bus Stops: 13 of 13 available
- Road Sensors: 2 of 2 available

72 Bus Lines Found.

Bus Lines:

- Bus Line: 23
Direction: NAVE A ROVEZZANO → NUOVO PIGNONE
- Bus Line: 23
Direction: SORGANE → NUOVO PIGNONE
- Bus Line: 35
Direction: MAGENTA → STAZIONE VIA ALABARNI

Query results organized by category

Total number of results: 2231

| Category | Number of Results |
|------------------------------|-------------------|
| Accommodation | 14 |
| Cultural | 21 |
| Education | 33 |
| Emergency | 16 |
| Entertainment | 1 |
| Environment | 38 |
| Financial | 24 |
| Government | 25 |
| Healthcare | 104 |
| Industry and Manufacturing | 292 |
| Mining and Quarrying | 245 |
| Shopping and Service | 264 |
| Tourism | 49 |
| Transfer Service and Renting | 18 |
| Utilities and Supply | 154 |
| Wholesale | |
| Wine and Food | |

N. results: No Limit

Search Range: visible areas

Search Results:

- Services: 2231 of 2231 available

Smart City API call generation

Web App HTML5

Mobile Apps

Embed into Web pages

DISIT Distributed Systems and Internet Technologies Lab
Distributed Data Intelligence and Technologies Lab
Department of Information Engineering (DINFO)
University of Florence

<http://www.disit.dinfo.unifi.it>

HOME ABOUT RESEARCH INNOVATION EDUCATION AND COURSES HOWTO

KM4CITY SERVICE MAP EMBEDDED

Disponibile su Google play

Scarica da App Store

Scarica da Windows Store



Linked Open Graph

log.disit.org/service/?graph=df5b4f67f01b7d96071475d62068e0fe

Linked Open Graph

SiiMobility (by DISIT)

Examples:

- VIA GIACOMO MATTEOTTI
- Bagno a ripoli
- Florence

Choose a class:

Search for keyword

keyword:

uri: http://... Request

Your data

sparql endpoint: (optional)

http://...

uri: http://... Request

Status

Requests:

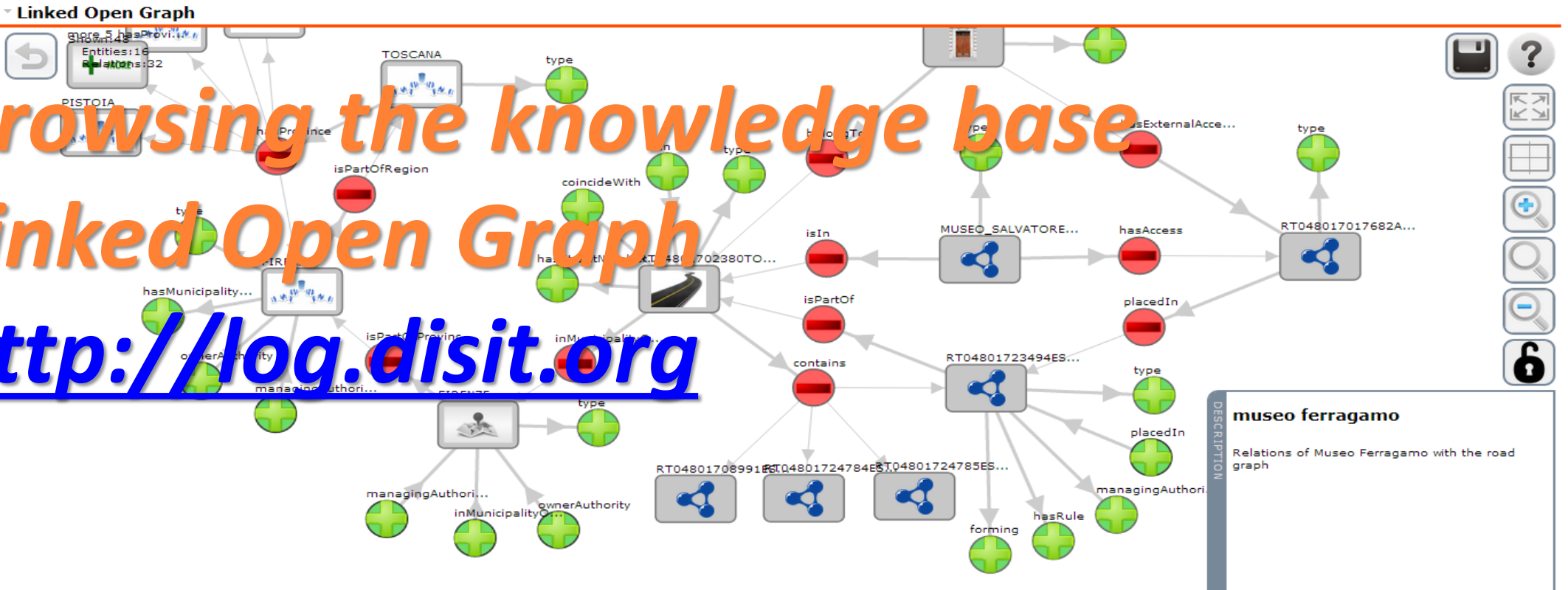
http://www.disit.dinfo.unifi.it/SiiMobility/MUSE

Remove Clear

Type of relations

Select all Deselect all Invert Hide all inverse

- belongTo
- contains
- ends
- has
- hasExternalAccess
- hasProvince
- hasStreetNumber
- isIn
- isPartOfProvince
- managingAuthority
- placedIn
- seeAlso
- coincideWith
- depiction
- forming
- hasAccess
- hasMunicipality
- hasRule
- inMunicipalityOf
- isPartOf
- isPartOfRegion
- ownerAuthority
- sameAs
- starts



Browsing the knowledge base

Linked Open Graph

<http://log.disit.org>



<http://log.disit.org/spqlquery/>

Flint SPARQL Editor 1.0.3

New Edit View Help

Dataset **KM4CITY** Mode **SPARQL 1.1 Query** Output **SPARQL-XML** Submit

Query 1

```
1 PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
2 PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
3
4 SELECT * WHERE {
5   ?s ?p ?o
6 }
7 LIMIT 10
```

All municipalities

Select all municipalities names.

```
PREFIX km4cr: <http://www.disit.org/km4city/schema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
SELECT * WHERE {
  ?s a km4cr:Municipality;
  rdfs:label ?l.
} ORDER BY ?l
```

Bus stops near the Florence SMN train station

The bus stops within 100m of the Firenze SMN

```
PREFIX km4cr: <http://www.disit.org/km4city/schema#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
```

Line 1: Position: 1; Copy: ...

Query Results

| # | s | p | o |
|---|---|---|---|
| 1 | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |
| 2 | http://www.w3.org/2000/01/rdf-schema#subPropertyOf | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |
| 3 | http://www.w3.org/2000/01/rdf-schema#subClassOf | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |
| 4 | http://www.w3.org/2000/01/rdf-schema#domain | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |
| 5 | http://www.w3.org/2000/01/rdf-schema#range | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |
| 6 | http://www.w3.org/2002/07/owl#equivalentProperty | http://www.w3.org/1999/02/22-rdf-syntax-ns#type | http://www.w3.org/1999/02/22-rdf-syntax-ns#Property |

Querying the knowledge base in SPARQL

City Resilience and, DSS, Decision Support Systems

<http://www.km4city.org/?controlRoom>

<http://www.km4city.org/?devTools>

<http://www.km4city.org/?infoDocs>

<http://www.km4city.org/?app>

Problems and issues

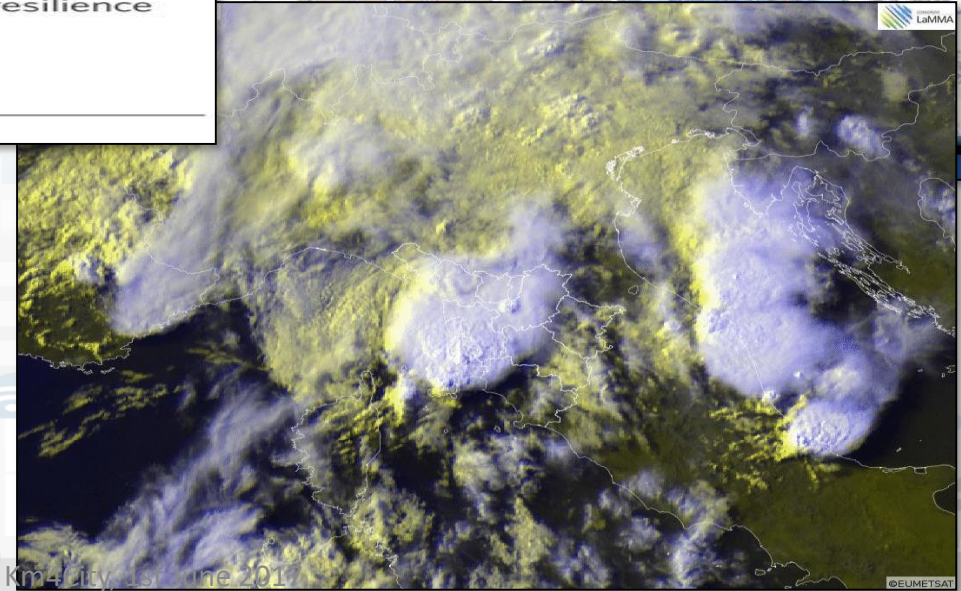
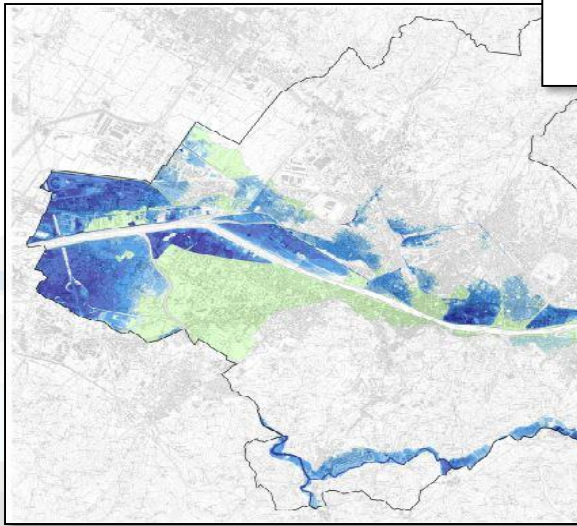
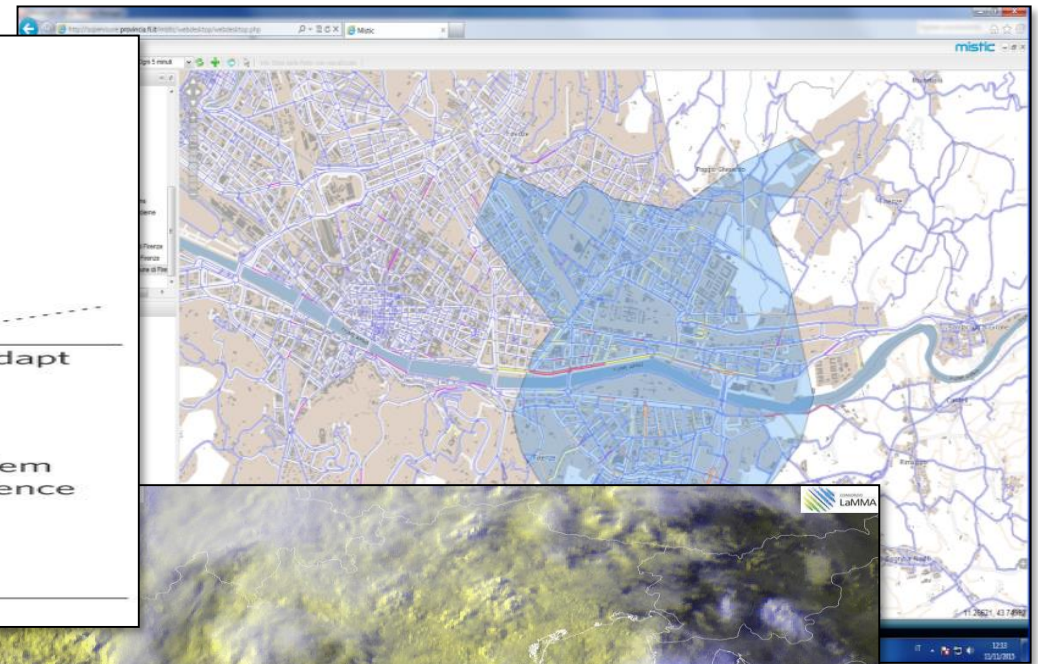
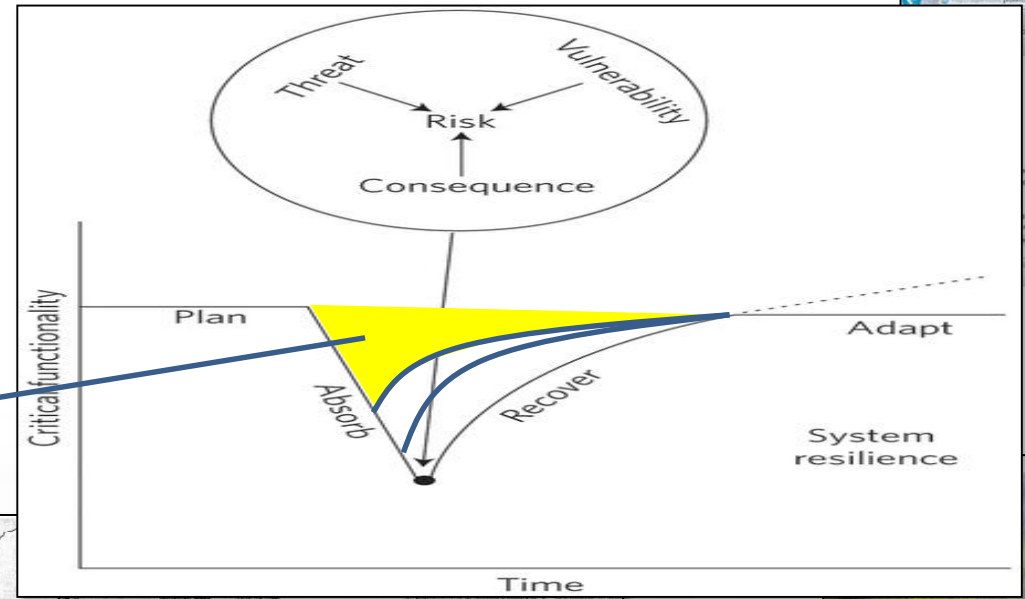
- Cities include critical infrastructures strongly related / depended each other:
 - Transport, energy, communication, cyber, health...
- Risks for these Critical Infrastructure (safety and security) may be due to natural and/or human made events.
- UTS, Urban Transport System, is one of the most challenging since UTS is the via by which many problems may propagate but also the path used by solutions and the recovery actions.



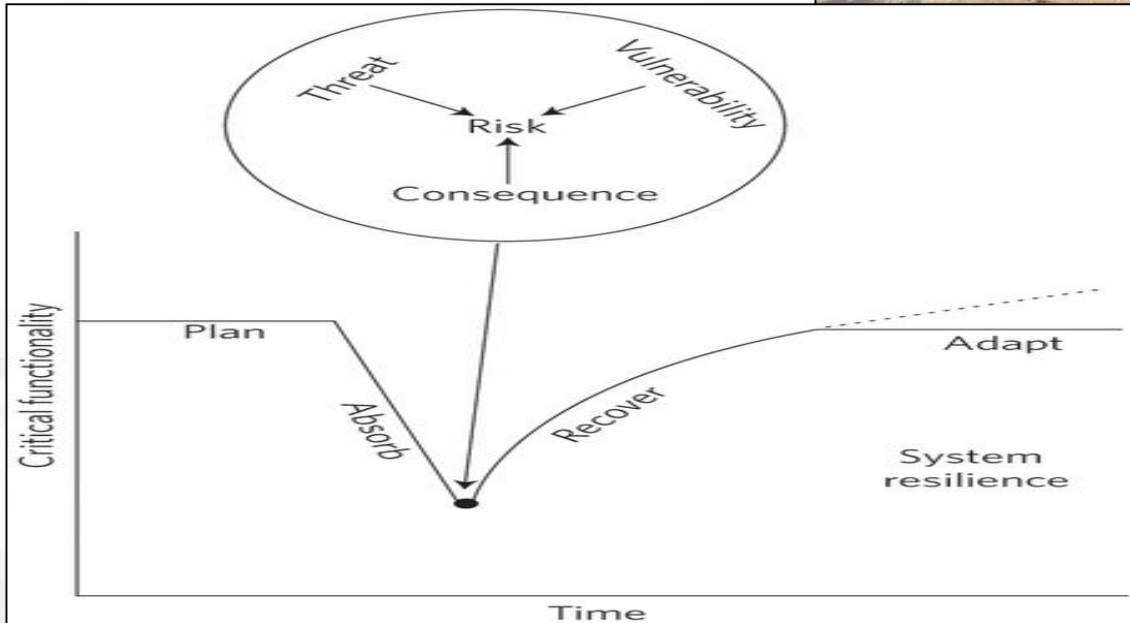
Early warning, detection

- P**repare
- A**bsorb
- R**ecover
- A**dapt

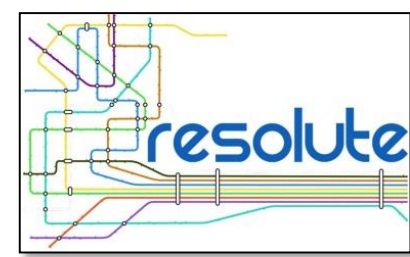
damage



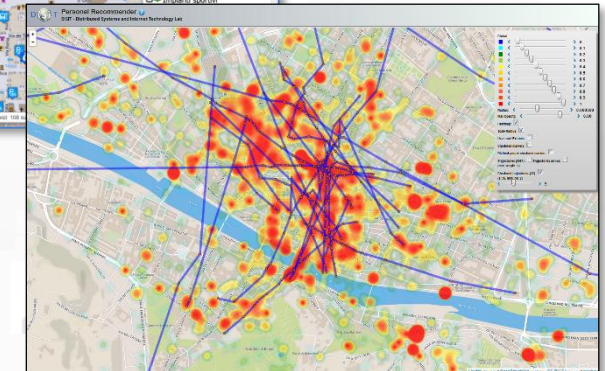
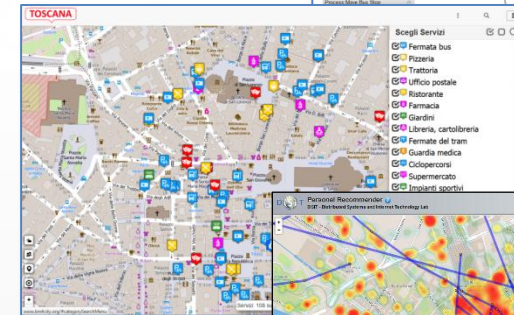
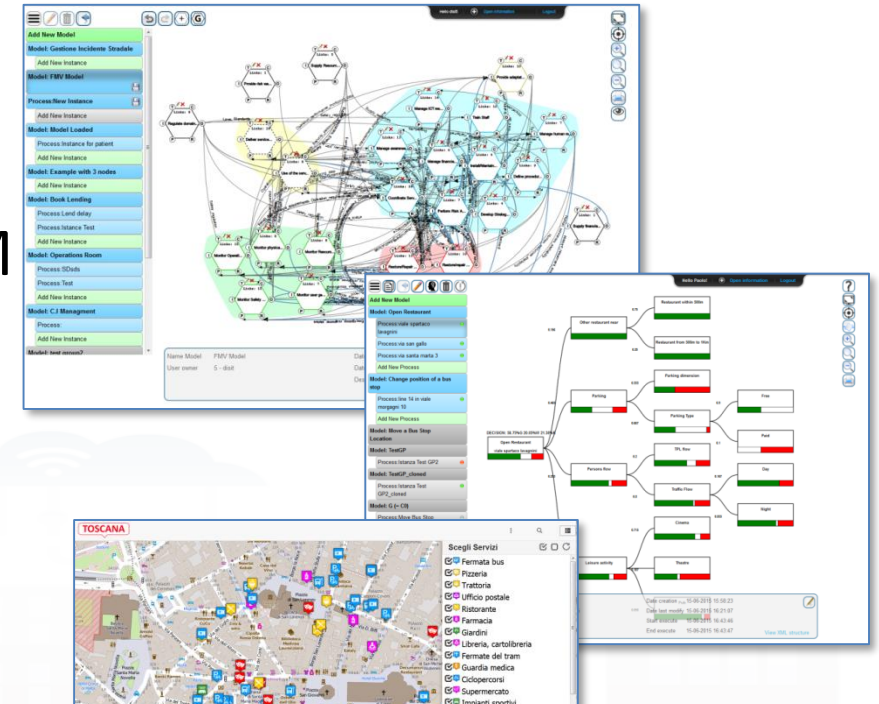
Prepare
Absorb
Recover
Adapt

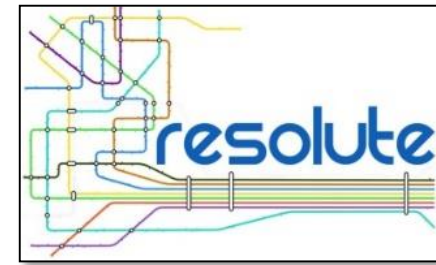


Main Approach

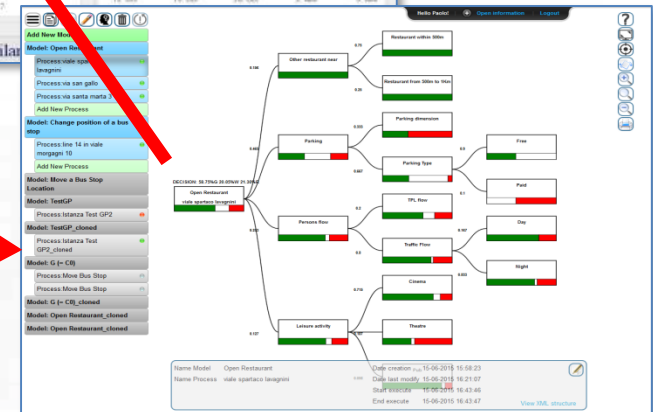
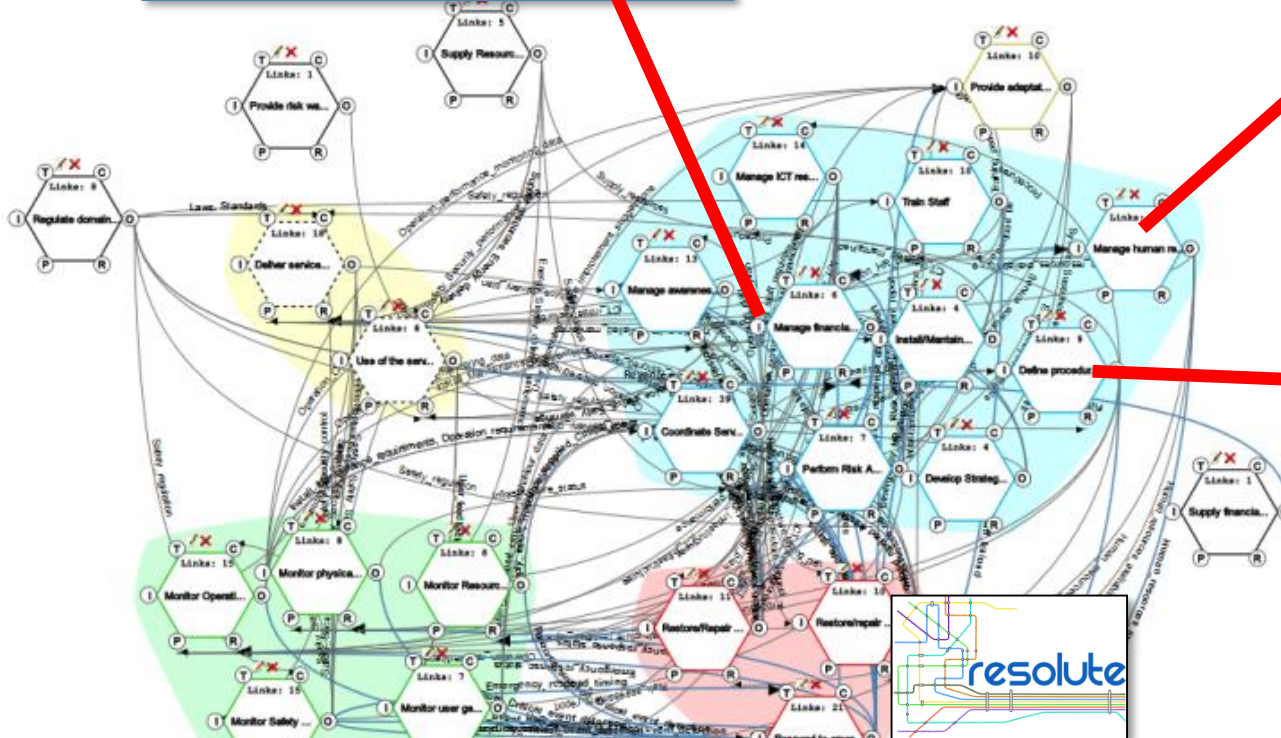
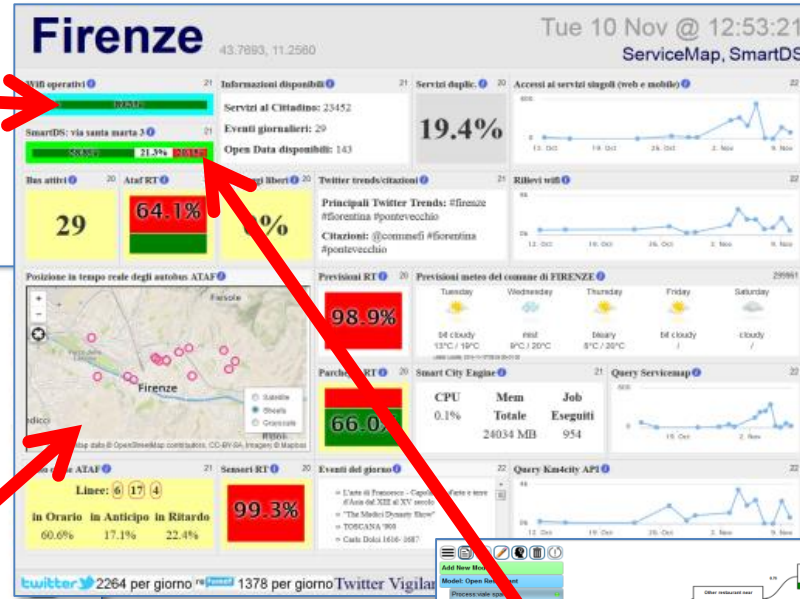
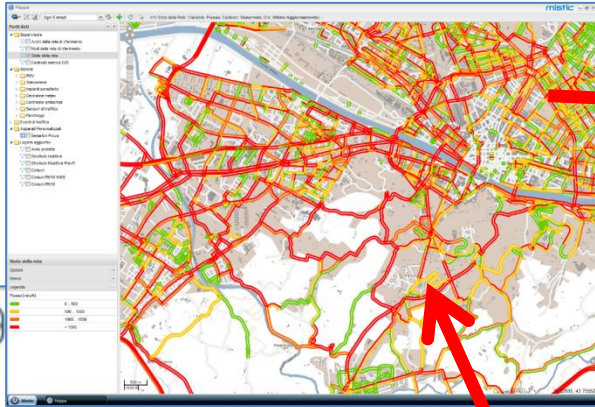


- Three main layers
- Complex System modeling: function, processes, resources, time, events, etc..
 - Functional Resonance Analysis Method, FRAM
 - Resilience Analysis Grid, RAG
- Decision Support System, DSS
 - System Thinking, Goal Models
 - Risk analysis
 - UTS/ITS decision supports
- Data, big data access and exploitation
 - Data Analytics, Internet of Things, sensors, flows
 - People flow and behavior
 - Social Media





Dashboarding city resilience

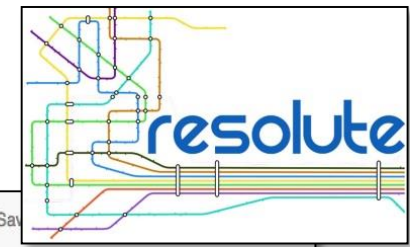


Data and Service Aggregator





Risk Assessment



Flood Event | Flood Observation | Traffic Observation | Damage analysis | Layers panel | Vulnerability info | Service Observation

Aerial with labels

Flood sensors observations:

| <input checked="" type="checkbox"/> | From | Data | mm/h |
|-------------------------------------|----------------------|---------------------|------|
| <input checked="" type="checkbox"/> | Firenze Genio Civile | 2016-04-11T15:59:00 | 12 |
| <input checked="" type="checkbox"/> | Firenze Peretola | 2016-04-11T15:59:00 | 20.5 |
| <input checked="" type="checkbox"/> | Firenze Università | 2016-04-11T15:59:00 | 10.5 |

Threshold:

From: :

To: :

Draw region to analyze: On

Load predefined region:

Mean precipitation:

SERVICE

NAME: villa maria teresa hospital...

ADDRESS: VIA DELLA CERNAIA, FIRENZE, FIRENZE

SERVICE TYPE: http://www.disit.org/km4city/schema#Public_hospital

SERVICE CLASS: http://www.disit.org/km4city/schema#HealthCare

SERVICE: http://www.disit.org/km4city/resource/7tab1bc45b84357b727dd67fe6081d2db

VALUE: 100

WKT DESCRIPTION: POINT (11.2561 43.7866)

Traffic observations:

| <input type="checkbox"/> | From | Date | km/h | car/km | car/h |
|--------------------------|---------------------------|---------------------|------|--------|-------|
| <input type="checkbox"/> | VIA DELLA MATTONAIA | 2016-10-10 18:01:08 | 58 | 15 | 2435 |
| <input type="checkbox"/> | LUNGARNO AMERIGO VESPUCCI | 2016-10-10 18:01:08 | 18 | 65 | 1842 |
| <input type="checkbox"/> | VIA CAMILLO CAVOUR | 2016-10-10 18:01:08 | 61 | 12 | 2009 |
| <input type="checkbox"/> | VIA VALFONDA | 2016-10-10 18:01:08 | 27 | 53 | 3307 |
| <input type="checkbox"/> | VIA VITTORIO ALFIERI | 2016-10-10 18:01:08 | 23 | 58 | 2798 |
| <input type="checkbox"/> | VIA SENESE | 2016-10-10 18:01:08 | 27 | 54 | 3216 |
| <input type="checkbox"/> | VIA GUELFA | 2016-10-10 18:01:08 | 68 | 3 | 420 |
| <input type="checkbox"/> | VIA DELLA SCALA | 2016-10-10 18:01:08 | 60 | 13 | 2157 |
| <input type="checkbox"/> | PIAZZA DI SAN FELICE | 2016-10-10 18:01:08 | 62 | 10 | 1697 |
| <input type="checkbox"/> | BORGO SAN FREDIANO | 2016-10-10 18:01:08 | 57 | 17 | 2690 |
| <input type="checkbox"/> | VIA VITTORIO ALFIERI | 2016-10-10 18:01:08 | 10 | 74 | 195 |
| <input type="checkbox"/> | VIA DEL CAMPUCCIO | 2016-10-10 18:01:08 | 60 | 13 | 2157 |
| <input type="checkbox"/> | VIA DEI BENCI | 2016-10-10 18:01:08 | 22 | 59 | 2679 |
| <input type="checkbox"/> | PIAZZALE DI PORTA ROMANA | 2016-10-10 18:01:08 | 64 | 8 | 1361 |

Assessing Risk

- hydraulic
- Seismic

Relevant Services

Min asset value:

| <input checked="" type="checkbox"/> | Service | Street | Type | Value |
|-------------------------------------|--------------------------------|---------------------------------|-----------------|-------|
| <input checked="" type="checkbox"/> | villa delle terme case di cura | VIALE MAZZINI GIUSEPPE, FIRENZE | Public | 100 |
| <input checked="" type="checkbox"/> | villa dei pini srl | VIA FOSCOLO UGO, FIRENZE | Public | 100 |
| <input checked="" type="checkbox"/> | Poggio Sacco | VIA INCONTRI, FIRENZE | Public_hospital | 100 |



Using and Contributing to Km4City





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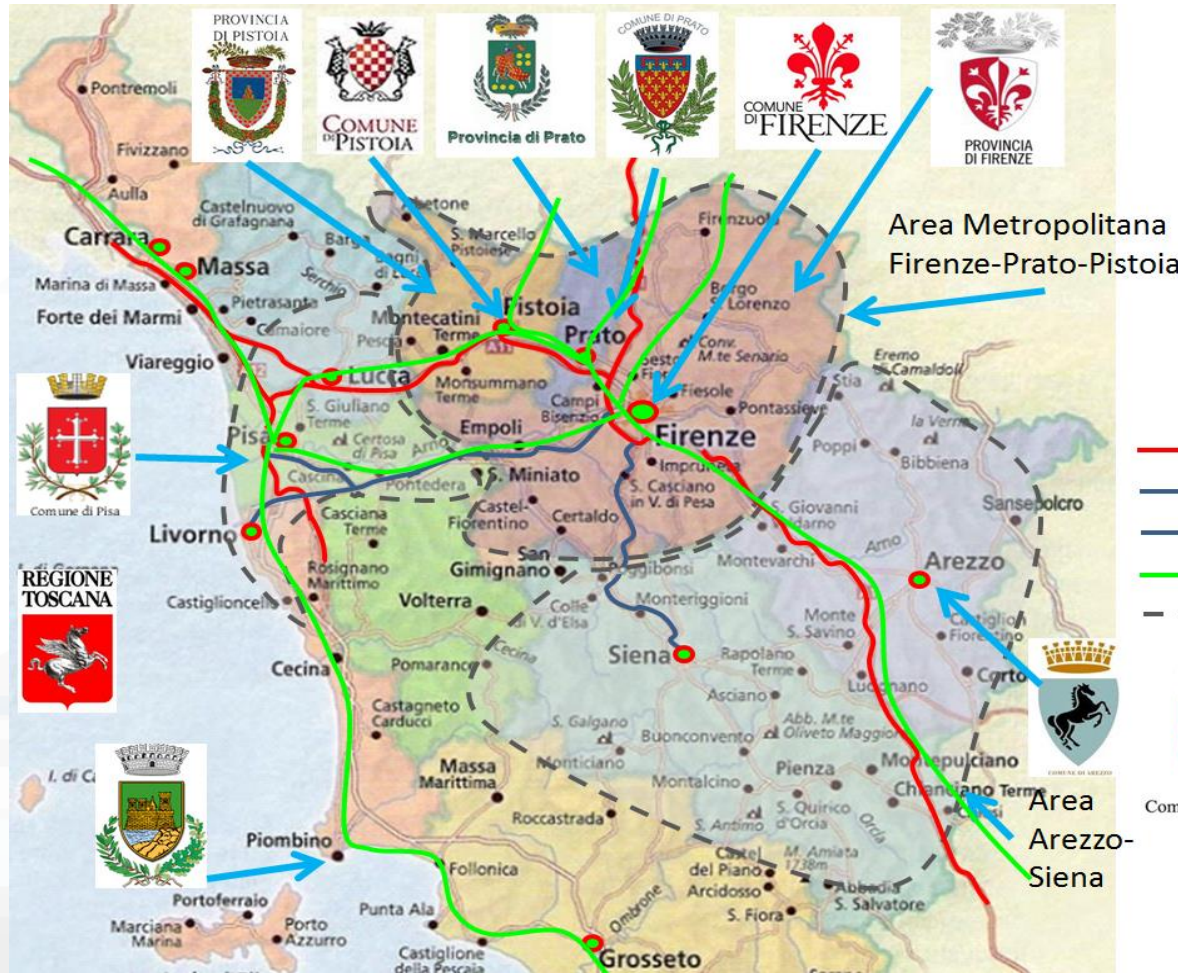
DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB
<http://www.disit.org>

Sii-Mobility

<http://www.Sii-Mobility.org>



- Experimentations and validation in Tuscany
- Integration with present central station and subsystems
- DISIT lab, Università di Firenze, is the tech-scientific coordinator



- ataf
- tiemme
- BUSITALIA
- atam
- CTT
- Comune di Perugia
- COMUNE DI NAPOLI

*ECM; Swarco Mizar;
Inventi In20; Geoin;
QuestIT; Softec; T.I.M.E.;
LiberoLogico; MIDRA
(autostrade, motorola);
ATAF; Tiemme; CTT
Nord; BUSITALIA;
A.T.A.M.; Effective
Knowledge; eWings;
Argos Engineering; Elfi;
Calamai & Agresti;
Project; Negentis*



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AND INTERNET
TECHNOLOGIES LAB

Sii-Mobility



<http://www.Sii-Mobility.org>

Commenti dei cittadini,
Social Media



AVM trasporto
Pubblico



Sensori,
sistema monitoraggio

Merci



Sensori su
trasporto Privato

Sensori
Parcheggi



Monitoraggio
traffico, autostrade



Rete
Ferroviaria

Parametri
ambientali

Servizi ed
enti



Ordinanze: eventi,
lavori pubblici, ..



Emergenze,
polizia, 118



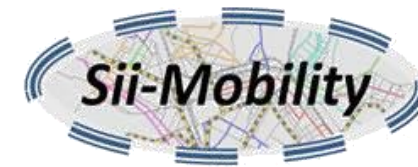
Infomobility



Varchi
Telematici, ZTL



General Objectives



□ <http://www.Sii-Mobility.org>

- Reduce the social costs of mobility
 - minor inconvenience,
 - greater efficiency,
 - greater sensitivity to the needs of the citizen,
 - lower emissions,
 - better environmental conditions;
 - info-training programs to help city user in getting virtuous habits;
 - reduce transportation costs and travel times for users, for operators and administrations,
 - optimization solutions.
- **Testing on municipalities and provinces of Tuscany**
- **Contribute to the improvement of national and international standards**
- **simplify the use of mobility systems**
 - innovative sensors for AVM and private transport on the territory
 - integrated systems for payment and identification
 - driving / offline routing solutions
 - connect the drive, smart drive or walk
 - Integration of data from operators and different type sources
 - advanced management of resources measurement of flows realization of sensors, actuators

Principali Delibere su Sii-Mobility



| PA | Tipo di atto |
|----------------------|---|
| Provincia di Prato | Delibera di Giunta n.267 del 30.10.2012 |
| Comune di Prato | Delibera di Giunta n.474 del 30.10.2012 |
| Provincia di Firenze | Delibera di Giunta n.147 del 06.11.2012 |
| Comune di Firenze | Delibera di Giunta n.403 del 06.11.2012 |
| Provincia di Pistoia | Delibera di Giunta n.156 del 08.11.2012 |
| Comune di Pistoia | Delibera di Giunta n.321 del 08.11.2012 |
| Comune di Pisa | Delibera di Giunta n.203 del 06.11.2012 |
| Comune di Arezzo | Delibera di Giunta n.498 del 07.11.2012 |
| Regione Toscana | Delibera di Giunta n.249 del 15.04.2013 |

□ <http://www.Sii-Mobility.org>



<http://www.resolute-eu.org>

- Develop European Resilience Management Guidelines (ERMG)
 - Develop a conceptual framework for creating/maintaining Urban Transport Systems
- Enhance resilience through improved support of human decision making processes, particularly by training professionals and civil users on the ERMG and the RESOLUTE system
- Operationalize and validate the ERMG by implementing the RESOLUTE Collaborative Resilience Assessment and Management Support Systems (CRAMSS) for Urban Transport Systems addressing Road and Urban Rail Infrastructures
 - Pilots in Florence and Athens
- Adoption of the ERMG at EU and Associated Countries level

| | | |
|---|----------|----|
| University of Florence: DISIT lab DINFO (Proj coordinator), DISIA and DST | UNIFI | IT |
| THALES | THALES | IT |
| ATTIKOMetro | ATTIKO | GR |
| Comune di Firenze | CDF | IT |
| Centre for Research and Technology Hellas | CERTH | GR |
| Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V. | FHG | DE |
| HUMANIST | HUMANIST | FR |
| SWARCO Mizar | SWMIZ | IT |
| Associação para o Desenvolvimento da Investigação no Instituto Superior de Gestão | ADI-ISG | PT |
| <i>Consorzio Milano Ricerche</i> | CMR | IT |



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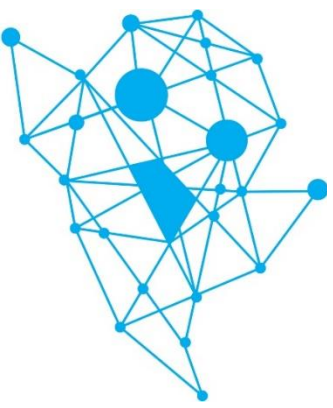
Horizon 2020
European Union Funding
for Research & Innovation

REnaissance of PLaces
with Innovative Citizenship
And TEchnology

<http://replicate-project.eu/>

- demonstrate Smart City technologies in energy, transport and ICT in districts in:
 - San Sebastian, Florence and Bristol,
 - follower cities of Essen, Nilufer and Lausanne
- Cities are the customer: considering local specificities
- Solutions must be replicable, interoperable and scalable.
 - Integrated Infrastructure: deployment of ICT architecture, from internet of things to applications
 - Low energy districts
 - Urban mobility: sustainable and smart urban services

- ❑1 (coordinator) FOMENTO DE SAN SEBASTIAN FSS SPAIN
- ❑2 AYUNTAMIENTO DE SAN SEBASTIAN SAN SEBASTIAN SPAIN
- ❑3 COMUNE DI FLORENCE FLORENCE ITALY
- ❑4 BRISTOL COUNCIL BRISTOL UNITED KINGDOM
- ❑5 STADT ESSEN ESSEN GERMANY
- ❑6 NILUFER BELEDIYESI NILUFER TURKEY
- ❑7 VILLE DE LAUSANNE LAUSANNE SWITZERLAND
- ❑8 IKUSI ANGEL IGLESIAS, S.A. IKUSI SPAIN
- ❑9 ENDESA ENERGÍA, S.A. ENDESA SPAIN
- ❑10 EUROHELP CONSULTING, S.L. EUROHELP SPAIN
- ❑11 ILUMINACION INTELIGENTE LUIX, S.L. LUIX SPAIN
- ❑12 FUNDACION TECNALIA RESEARCH & INNOVATION TECNALIA SPAIN
- ❑13 EUSKALTEL, S.A. EUSKALTEL SPAIN
- ❑14 COMPAÑÍA DEL TRANVÍA DE SAN SEBASTIÁN DBUS SPAIN
- ❑15 CONSIGLIO NAZIONALE DELLE RICERCHE CNR ITALY
- ❑16 ENEL DISTRIBUZIONE, SPA ENEL ITALY
- ❑17 MATHEMA, SRL MATHEMA ITALY
- ❑18 SPES CONSULTING SPES ITALY
- ❑19 TELECOM ITALIA, SPA TELECOM ITALY
- ❑20 UNIVERSITA DEGLI STUDI DI FLORENCE UNIFI ITALY: DINFO.DISIT Lab and DIEF
- ❑21 THALES ITALIA, SPA THALES ITALY
- ❑22 ZABALA INNOVATION CONSULTING ZABALA SPAIN
- ❑23 TECHNOMAR TECHNOMAR GERMANY
- ❑24 UNIVERSITY OF BRISTOL UOB UNITED KINGDOM
- ❑25 UNIVERSITY OF OXFORD UOXF UNITED KINGDOM
- ❑26 BRISTOL IS OPEN, LTD BIO UNITED KINGDOM
- ❑27 ZEETTA NETWORKS ZEETTA UNITED KINGDOM
- ❑28 KNOWLE WEST MEDIA CENTRE, LGB KWMC UNITED KINGDOM
- ❑29 TOSHIBA RESEARCH EUROPE, LTD TREL UNITED KINGDOM
- ❑30 ROUTE MONKEY, LTD ROUTE MONKEY UNITED KINGDOM
- ❑31 ESOTERIX SYSTMES, LTD ESOTERIX UNITED KINGDOM
- ❑32 NEC LABORATORIES EUROPE, LTD NEC UNITED KINGDOM
- ❑33 COMMONWHEELS CAR CLUB CIC CO-WHEELS UNITED KINGDOM
- ❑34 UNIVERSITY OF THE WEST OF ENGLAND UWE UNITED KINGDOM
- ❑35 ESADE BUSINESS SCHOOL ESADE SPAIN
- ❑36 SISTELEC SOLUCIONES DE TELECOMUNICACION, S.L. SISTELEC SPAIN



Governing the smart city: a gOvernance-centred approach to Smart urbanism – GHOST



General Objectives

- Offer a comprehensive framework for measuring and reassessing urban smart development and related rankings
- Critical assessment of Smart City ranking index existence
- Definition of an enabling technology supporting the action plans for strengthening multi-level place-based governance, applied in the tourism context
- Definition of strategies for good smart governance, with the purpose of providing recommendations to start or implement an institutional and development process leading towards smart city governance.

Partners:

University of Cagliari (Coordinator) DICAAR and DMI

University of Florence SAGAS and DISIT

University of Turin ESOMAS

University of Sassari DADU

Under the patronage of the Municipality of Cagliari



Duration: 23/09/2015 - 23/09/2018

<http://sites.unica.it/ghost>

Info and Documents

<http://www.km4city.org/?infoDocs>

<http://www.disit.org>



Acknowledgement

- Thanks to the European Commission for founding. All slides reporting logo of **RESOLUTE H2020** are representing tools and research founded by European Commission for the RESOLUTE project. **RESOLUTE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 653460).
- Thanks to the European Commission for founding. All slides reporting logo of **REPLICATE H2020** are representing tools and research founded by European Commission for the REPLICATE project. **REPLICATE** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme (grant agreement n° 691735).
- Thanks to the MIUR for co-founding and to the University of Florence and companies involved. All slides reporting logo of **Sii-Mobility** are representing tools and research founded by MIUR for the Sii-Mobility SCN MIUR project.
- **Km4City** is an open technology exploited by those projects and line of research of DISIT Lab. Some of the innovative solutions and research issues developed into the above mentioned projects are also compliant and contributing to the Km4City approach and thus are contributing to the open Km4City model of DISIT lab.





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Km4City overview & start working on it

<http://www.disit.org/km4city>

www.Km4City.org

Paolo Nesi, paolo.nesi@unifi.it

