



UNIVERSITÀ
DEGLI STUDI
FIRENZE

DINFO
DIPARTIMENTO DI
INGEGNERIA
DELL'INFORMAZIONE

DISIT
DISTRIBUTED SYSTEMS
AND INTERNET
TECHNOLOGIES LAB

Smart Cities



Piattaforma Km4City

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

Paolo Nesi, paolo.nesi@unifi.it

www.Km4City.org

<http://www.disit.org/7139>





OPENDATA








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SENTIENT CITY CONTROL ROOM

BACK OFFICE AND DEV TOOLS

APP

WEBAPP

INFO AND DOCS



KM4CITY

Open Urban Platform for a Sentient Smart City

Km4City platform is a Smart City tools for implementing the city vision, monitoring the city evolution, diffusely providing new services for improving quality of life of city users, for the city economic grow; stimulating city users; since an attractive city is a 'city that produces' in which users are happy and proud.

www.Km4City.org



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Km4City Roadmap



12/2017
WEEE
2017-2020

- waste
- Territorial areas and paths
- Health, Bike sharing
- Statistics, Energy, ICT, ...
- E-vehicles

6/2017

- Risk analysis
- Environmental, water
- Data Licensing models
- Energy Meters
- Fi-Ware compliant



- IOT/IOE
- Monitoring
- Smart City IOT integration
- Living Lab



- Smart City vs IOT, Industria 4.0

6/2018

SMARTCITY
EXPO WORLD CONGRESS

11/2018

2021

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>

2014

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

2015

Km4City 1.4

- Embed
- More API
- iBeacon

RESilience management guidelines and Operationalization applied to Urban Transport Environment

Km4City 1.5

- SmartDS
- Km4City App

RESOLUTE H2020
2015-2018 - Started

<http://www.sii-mobility.org>

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

GHOST SIR
2016-2019 - Started

GHOST
Enriching the smart city with innovative citizenship and technology

Transport systems
Mobility, parking



Public Services
Govern, events, ...



Sensors, IOT
Cameras, ...



Environment,
Water, energy



Shops, services,
operators



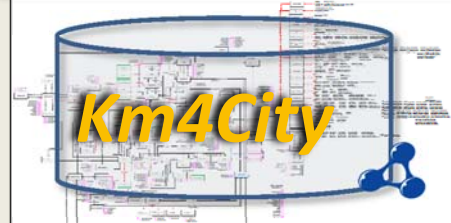
Social Media
WiFi, network



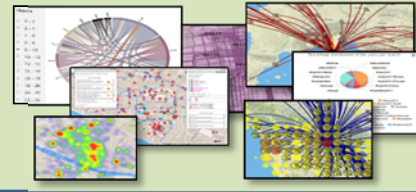
Static, Slow and Real Time data flows

Km4City Smart City Engine

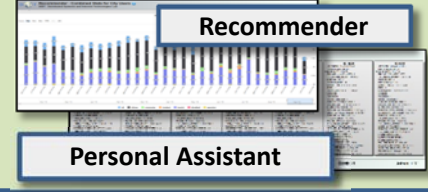
DISCES -- Distributed and parallel architecture on Cloud



Big Data Analytics



Smartening Tools



Development Tools



Km4City Smart City API

City Operators and Decision Makers

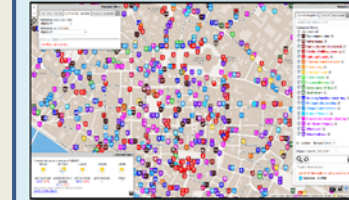
Dashboards



Smart Decision Support



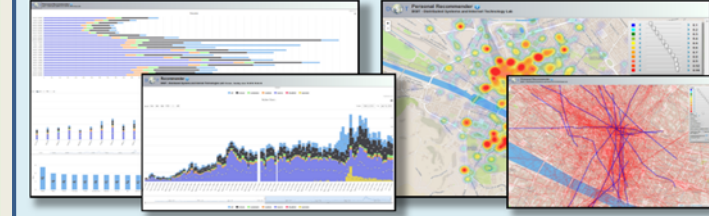
ServiceMap browser



Twitter Vigilance



Analyzers of City User Behavior



Tools for Final Users

Mobile e Web Apps



**Present data on
Tuscany Region
January 2018**

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 Public 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 Transport Pub Lines: 1-2 up per day, time-path
- >210 parking lots 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
- 22 Environmental data: 20 updates X day X sensor
- 39 Bike Sharing data: Pisa and Siena
- 12 Pollination data
- 140 recharging stations
- Smart benches, waste mng, irrigators, lighting,...
- Florence ent.events: about 60 new events X day
- Different kinds of Florence traffic events,
- [1600 Fuel stations: 1 update X day X station]
- 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 sensors



- Nascondi Menu

Previs

Giovedì	Venerdì	Sabato
poco nuvoloso 23°C / 27°C	poco nuvoloso 20°C / 33°C	velato

- Nascondi Menu

- Nascondi Menu

Servizi Regolari | Servizi Trasversali

search text into service

Categorie Servizi

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

N. risultati: Nessun Limite

Raggio ricerca 100 metri

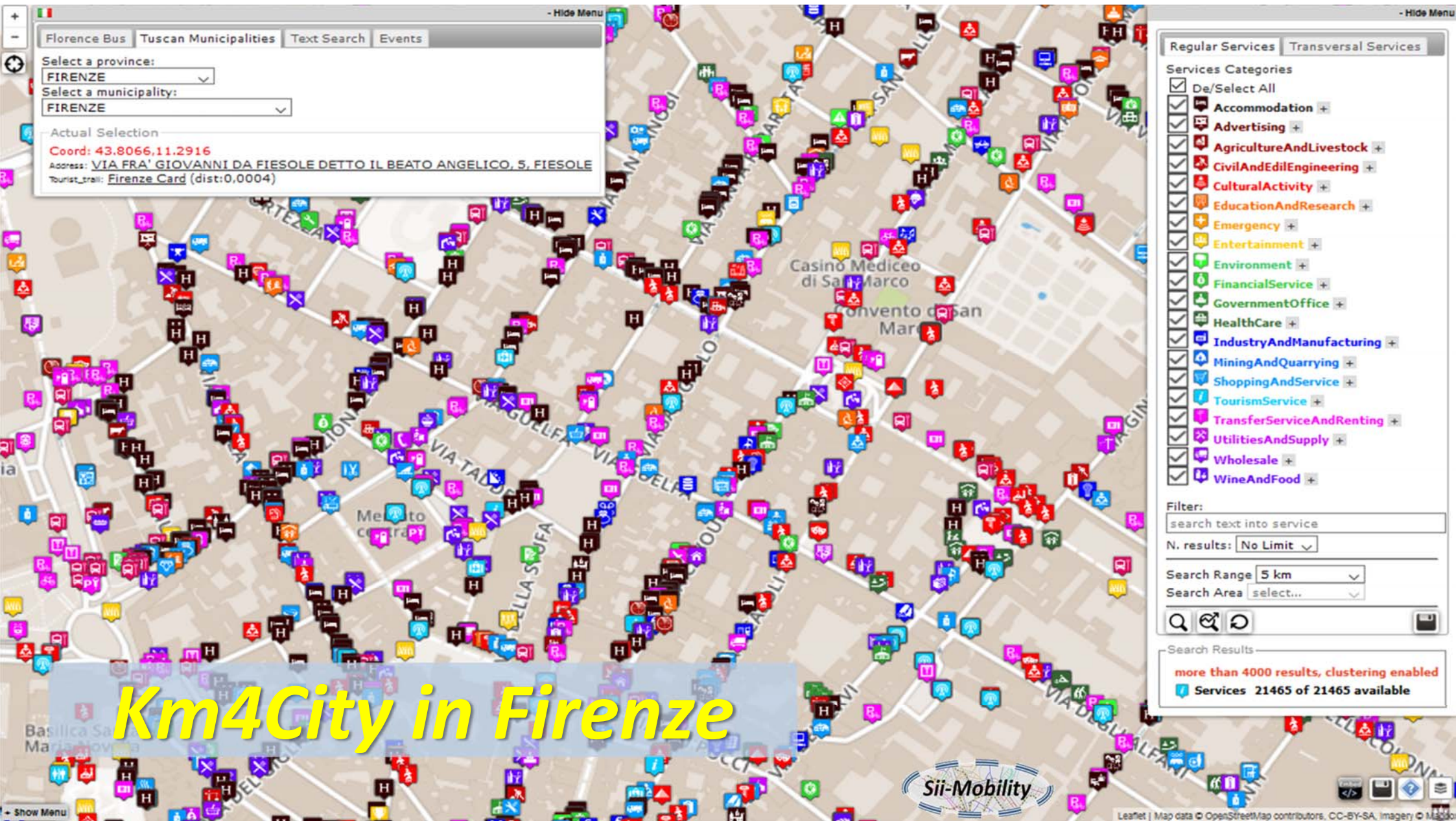
Risultati della ricerca

più di 4000 risultati, attivato clustering

Services 16858



<http://servicemap.km4city.org>



Florence Bus Tuscan Municipalities Text Search Events

Select a province:
FIRENZE

Select a municipality:
FIRENZE

Actual Selection
Coord: 43.8066,11.2916
Address: VIA FRA' GIOVANNI DA FIESOLE DETTO IL BEATO ANGELICO, 5, FIESOLE
Tourist_trail: Firenze Card (dist:0,0004)

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

more than 4000 results, clustering enabled

Services 21465 of 21465 available

Km4City in Firenze



Hide Menu

Florence Bus Tuscan Municipalities Text Search Events

Select an agency:
Ataf&Linea

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: Sorgane Piazza Rodolico

TPL STOP: Sorgane Piazza Rodolico

Ataf&Linea

LINKED OPEN GRAPH

Lines:
24

Display 10 Bus per page

Search:

Time	Line	Direction
06:00:00 2016-11-10	24	Grassina
06:10:00 2016-11-10	24	Sorgane Piazza Rodolico
06:15:00 2016-11-10	24	Osteria Nuova
06:20:00 2016-11-10	24	Grassina
06:42:00 2016-11-10	24	Sorgane Piazza Rodolico

Showing page 1 of 7

Real-time data currently not available

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: 10

Search Range 100 mt

Search Area select...

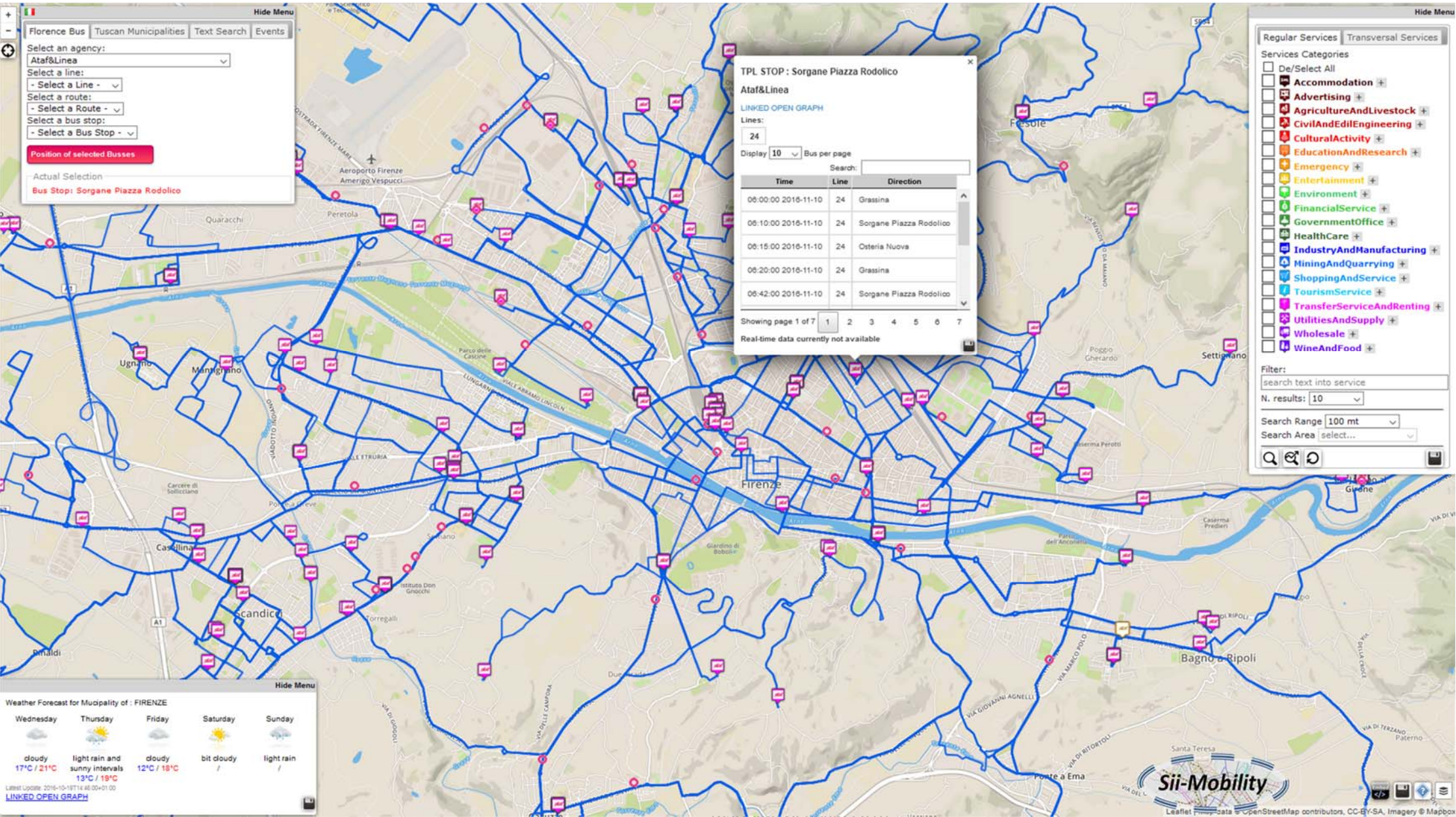
Hide Menu

Weather Forecast for Municipality of : FIRENZE

Wednesday	Thursday	Friday	Saturday	Sunday
cloudy 17°C / 21°C	light rain and sunny intervals 12°C / 18°C	cloudy 12°C / 18°C	bit cloudy	light rain

Latest Update: 2016-10-19T14:46:00+01:00

LINKED OPEN GRAPH





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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)

Regular Services | Transversal Services

Services Categories

- De/Select All
- Area
- DigitalLocation
- HappeningNow
- Path
- Cycle_paths
- Tourist_trail
- Tramline

Filter:

search text into service

N. results for each: No Limit

Search Range: visible areas

Search Results: Services 228 of 228 available

Risultati

Percorsi Ciclabili_309	Tipo: Ciclopercorsi	Distanza: 172 m
Percorsi Ciclabili_305	Tipo: Ciclopercorsi	Distanza: 181 m

Risultati

Arena Esterno Notte Poggio	Tipo: Cinema	Distanza: 351 m
Auditorium Flag	Tipo: Teatro	Distanza: 351 m

serviceapp.disit.org/WebAppGrafo/mappa.jsp#close

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

DISIT lab, Gennaio 2018



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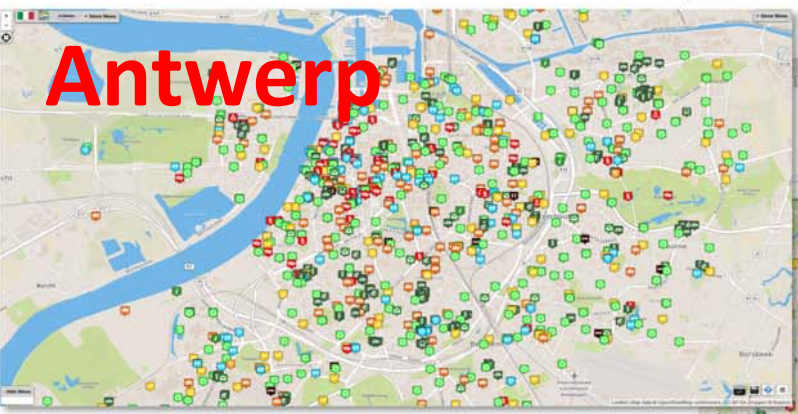
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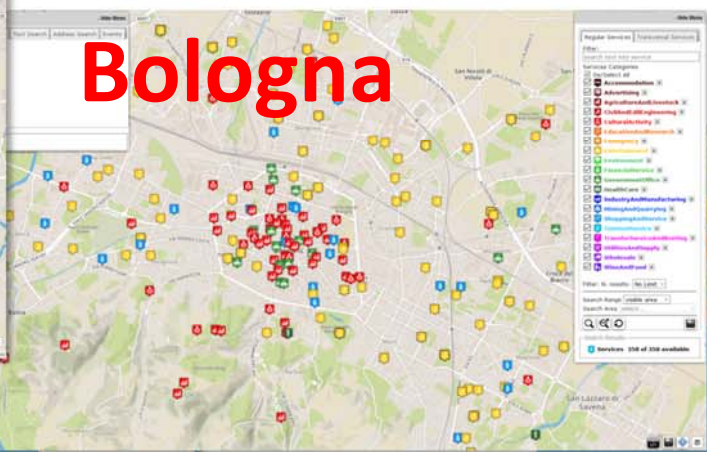
Km4City in ...



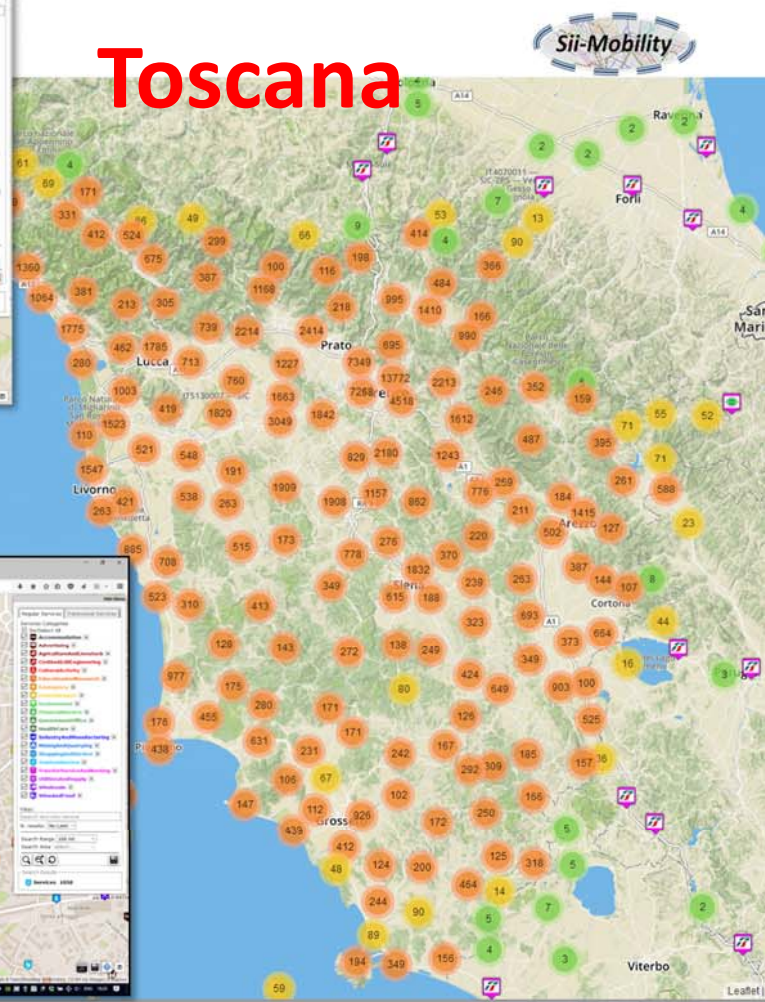
Antwerp



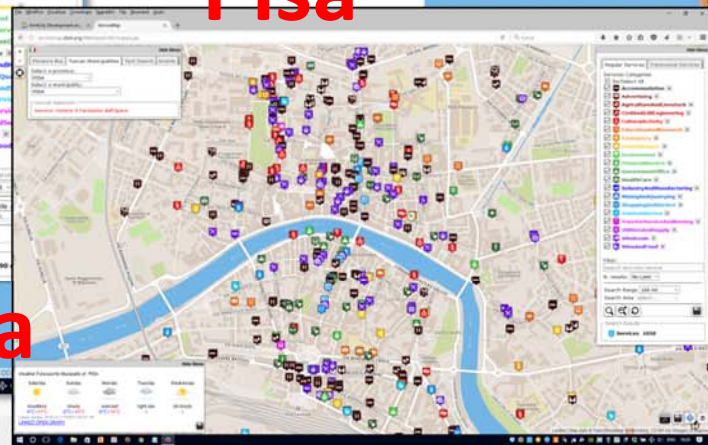
Bologna



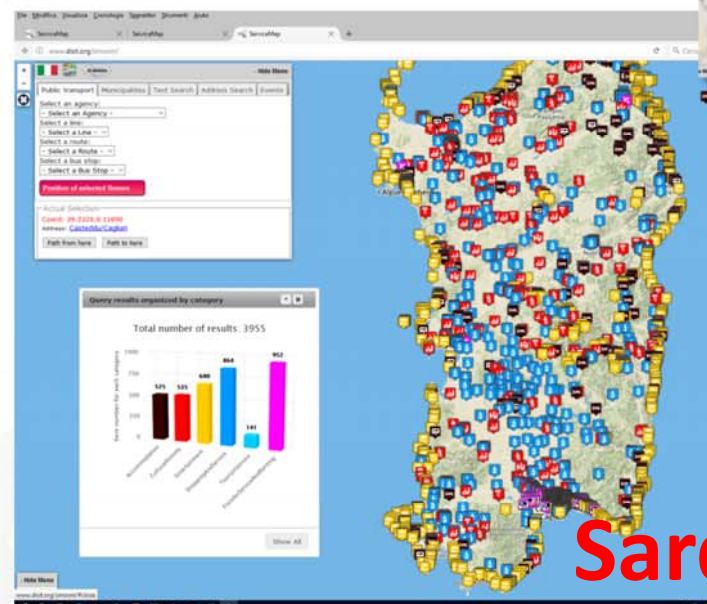
Toscana



Pisa



Sardegna



• **Search all services in the area**

Dashboard for all

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



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DISIT lab, Gennaio 2018

Sentient City Control Room

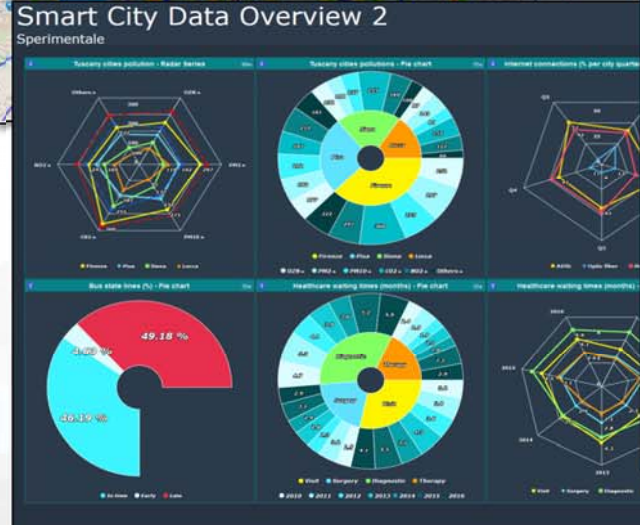
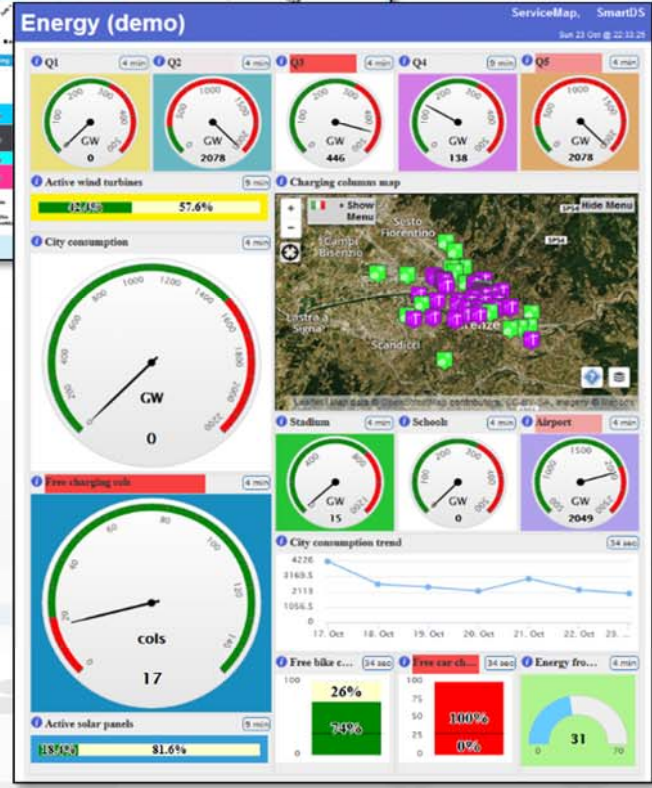
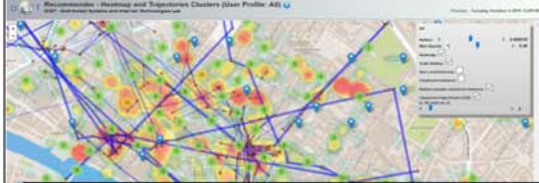
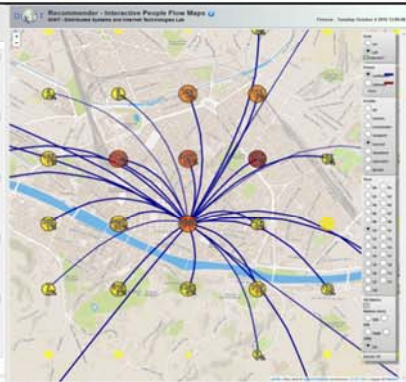


DISIT lab, 15 August 2017

Smart City Dashboard



Horizon 2020
European Union Funding
for Research & Innovation



Florence data overview

A table based overview over city main data

Wed 18 Jan @ 19:19:10

Substance	CO2+	PM2.5	PM10+	CO2+	NO2+	PM10	Wind speed (km/h)	Direction	Temperature (°C)	Humidity (%)	Rain today (mm)	Pressure (hPa)	Fire / Alarm	Quality (%)	Cost (%)	Availability time (%)	Emergency handling (%)
Q1	128	41	181	36	4	50	N	13	9	922	0	922	Water	92	87	95	82
Q2	33	75	66	123	63	85	NE	17	0	876	0	876	Public transportation	76	76	31	11
Q3	225	151	164	195	211	78	E	4	22	1022	0	1022	Public safety	77	64	58	62
Q4	174	231	87	122	93	42	S	6	0	913	0	913	Health management	48	43	31	15
Q5	79	87	73	27	65	181	N	7.2	23	0	0	0	Welfare	63	51	39	36
Q6						93	O	3	19	0	0	0	Public administration	58	16	18	22

Category	Total artworks	Overights	Day shows	Free	Full	Winter	Spring	Summer	Autumn
Alphons	56	36	20	7	23	6	10	4	10
John	122	81	41	4	16	3	7	6	4
Car	215	133	82	6	18	15	100	50	35
Bus	157	110	47	0	0	0	0	0	0
Cruiser	0	0	0	7	7	2	6	2	4
Real	0	0	0	35	15	10	22	9	9
	0	0	0	30	42	8	25	30	9
Total	550	360	190	20	192	55	104	27	26

DISIT lab, Gennaio 2018

Click POI of interest below

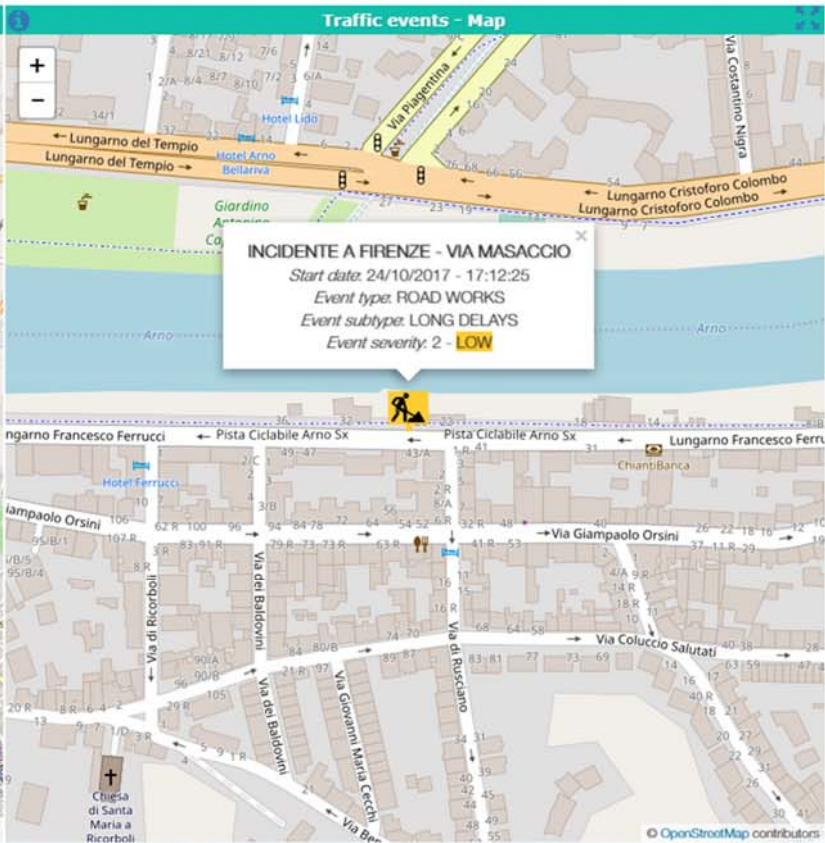
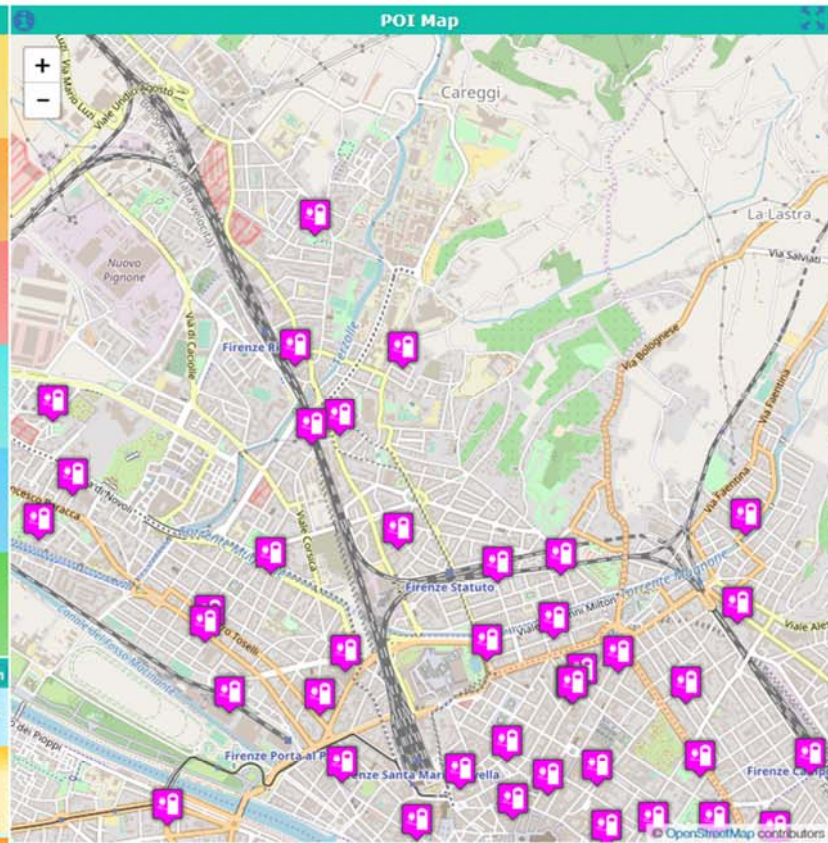
- (1)** Fast recharging stations
- (2)** Cicle paths
- (4)** Public transport paths (F)
- (6)** Restricted traffic areas
- (8)** Parking status
- (7)** Variable Message Signs (F)

Traffic events 18m

(5) INCIDENTE A FIRENZE - VIA MASACCIO
LONG DELAYS
24/10/2017 17:12:25 2 ON MAP

INCIDENTE A FIRENZE - VIA MASACCIO
ACCIDENTI (s)
24/10/2017 20:44:29 5

INCIDENTE A FIRENZE - VIA GARFAGNANA
ACCIDENTI (s)
25/10/2017 11:50:29 8



First aids overview - Tuscany

Service status of main first aids

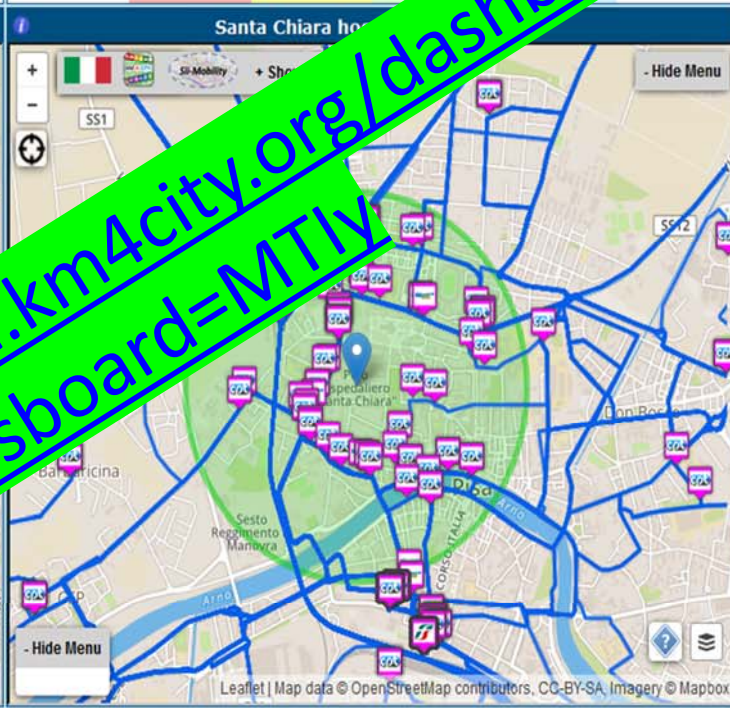
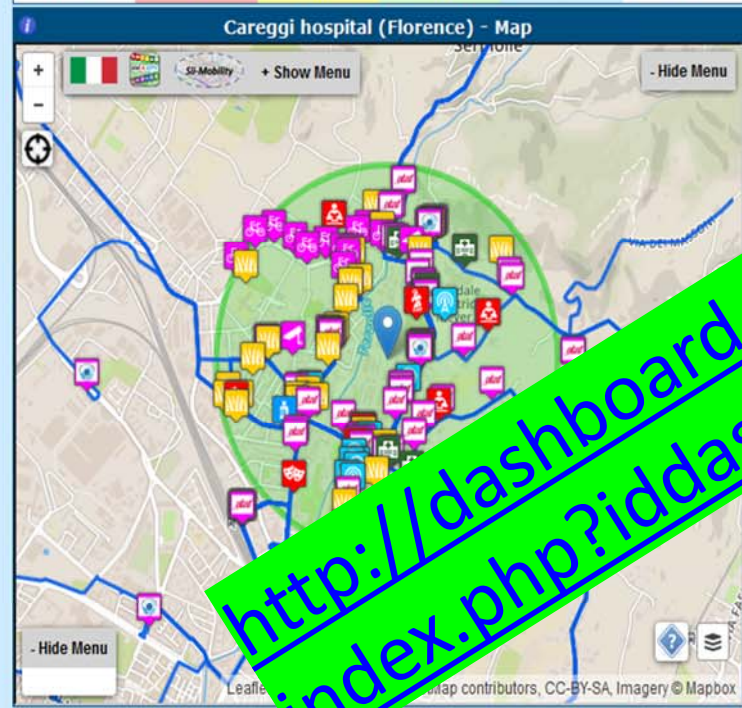


Day @ 11:00:34

Careggi hospital (Florence) - Details					
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					
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					
Priority\Hospital	Red code	Yellow code	Green code	Blue code	White code
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



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
Totals	2	26	14	5	0

<http://dashboard.km4city.org/dashboardSmartCity/view/index.php?iddashboard=MTIV>

ESB

Alarms

- TEST - ALLUVIONE MUGNONE MAJOR
- ALLUVIONE ARNO COVERCIANO CRITICAL
- ALLUVIONE ARNO VIA PIETROLO MAJOR
- TEST - SCORTRI ALLO STADIO CRITICAL

Traffic events

- SEVERE ACCIDENT(S) SERIOUS ACCIDENT(S)
- ROAD WORKS ROADWORKS
- ORD 2017-001302 - SP NA 47 APTALTO VALDARNOA7PST
- RESTRICTIONS
- INTERVENTO URGENTE PUBBLICOGUA CLOSED AHEAD

Evacuation plans

- PLAN N. 1497263867 IN PROGRESS
- PLAN N. 2000000000 PROPOSED
- PLAN N. 1497604404 PROPOSED

Tram position

- TRAM1
- TRAM2

Network Analysis

- FMS495
- INDORAL2801
- INDORAL2802
- INDORAL2803
- INDORAL2804
- INDORAL2805
- INDORAL2806
- INDORAL2807
- INDORAL2808
- INDORAL2809
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- INDORAL2897
- INDORAL2898
- INDORAL2899
- INDORAL2900

Environment

PROFEZIONE CIVILE

GENERAL METEO

22 C°

221

24 C°

20 %

RISCHIO IDRAULICO

RISCHIO TEMPORALI

RISCHIO IDROGEOLOGICO

RISCHIO NEVE

RISCHIO GRANDINE

RISCHIO VENTO

RISCHIO MAREGGIATE

Pluv. Firen...

Pluviometro Florence City - Last 24h

Hydromete...

Hydrometer Arno Nave di Rossano - Last 24h

M.S.Z.L.

Hydromete...

Hydrometer Arno Florence Uffizi - Last 24h

M.S.Z.L.

Hydromete...

Hydrometer Mugnone Ponte alle Vespe - Last 24h

M.S.Z.L.

Mobility

Bus Lines Status

ULTIMO AGGIORNAMENTO: 2017-06-21 12:38:53

Underpass Viale Mariti Aperto

Underpass Viale Talenti closed

Underpass Fortezza Aperto

ESB events

Fortezza Fi...

Mercato Ce...

Resources

Planned events

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

2016-12-01 to 2017-07-02

VIA CAMILLO CAVALOTTI 3

ESPLORATE LE BIBLIOTECHE DELL'UNIVERSITÀ DI FIRENZE IN

2017-02-15 to 2017-06-23

PIAZZA DI SAN LORENZO 9

BIBLIOTECHE DELL'UNIVERSITÀ DI FIRENZE IN MOSTRA - PROR

2017-02-15 to 2017-09-28

Ambulance...

Ambulance...

Voluntiers

20 num.

33 num.

Florence main first aids status

Red code	Yellow code	Green code	Blue code	White code
1	7	14	1	0
PS SANTA MARIA NUOVA				
PS SAN GIOVANNI DE' DIO TORRELLI	2	10	24	2
PS SANTA MARIA ANNUNZIATA	10	27		

TRENDS QUOTES

#FIRENZE

#NEWS #FIRENZE

#FIRENZE #RIFIUTI

#UFFIZI

#PONTEVEGGIO

#BARGELLO

#AEROPORTO #FIRENZE

#DUOMO #FIRENZE

#VIAGGI #FIRENZE

#GRONACA #FIRENZE

#MUSEOFIRENZE

@COMUNEFI

#NAZIONE_FIRENZE

@PROTIVCOMUNEFI

@UN_FIRENZE

#HUBFIRENZE

@NOVEDAFIRENZE

@SILTUS

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

08:10:00 to 2017-06-21 12:35:00

Channel statistics

Channel: Firenze

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

Data processed from 2015-06-22 to 2017-03-24

Sentiments trends in channel: Firenze

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

From: May 21, 2017 To: Jun 21, 2017

Most Significant Tweets for Sentiment

Last tweets per channel: Firenze

Daily number of tweets/reweets for channel: Firenze

Firenze Wi-Fi - Access Points Clusters Coverage Map

Firenze - Wednesday June 21 2017 12:43:12

Firenze Wi-Fi - APs Streaming Realtime

Firenze - Wednesday June 21 2017 12:43:12

<http://dashboard.km4city.org/dashboardSmartCity/view/index.php?iddashboard=MT15>

Smart City Control Room Console

Entry point for REPLICATE dashboards



Tue 21 Nov 19:30:36

Energy

Environment

Mobility and Transport

Social

4 in one UHD

Energy Pilot

Environment and Weather

Mobility and Transport

Web and Social

4 in one UHD (2)

Data Aggregation and Data Analytics
SIT Lab

RealTime Sensors via ServiceMap3D

Resilience Management

Resilience Dashboard by RESOLUTE

<http://www.disit.org/dashboardSmartCity/view/index.php?idashboard=MTY1>

Big Data Analytics



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DISIT lab, Gennaio 2018

What is enabling and providing smart services

- Smart Parking, in Tuscany
- Smart First Aid in Tuscany
- Smart Fuel pricing in Tuscany
- Smart search for POI and public transport srv.
- Public Transportation in Tuscany
- Routing in Tuscany
- Social Media Monitoring and acting
- Traffic events and Resilience in Florence
- Bike Sharing in Pisa and Siena
- Recharge stations for e-vehicles
- Entertainment Events in Florence
- Traffic Sensors in Tuscany
- Weather forecast/condition in Tuscany
- Pollution and Pollination in Tuscany
- People Monitoring Assessment in the City, in Florence via Wi-Fi
- People Monitoring, in Tuscany via App

All Point of Interests, cultural activities, IOT, ...
Over than 1.2 Million of complex events per day!

<http://servicemap.km4city.org>



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Km4CityMobile App



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

FIRENZE

ESERCITAZIONE MUGNONE 2016

MODALITÀ 2016
28 maggio 2016

Sardegna Mugnone 2016
28 maggio 2016
08:00-12:00

Regione Toscana

Suggerimenti

Post

Piazza Santissima 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

web application
<http://www.km4city.org>

Tutta la posta in un unico posto

Calendario Posta

Sereno 3° 11°
Microsoft Edge Roma

NETFLIX

FIRENZE

Xbox

Anteprima Sk... Tuneln Radio Twitter

80&A

DISPONIBILE SU
 Google play

Scarica da
 App Store

Scarica da
 Windows Store



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Km4City APP



- **Mobility**

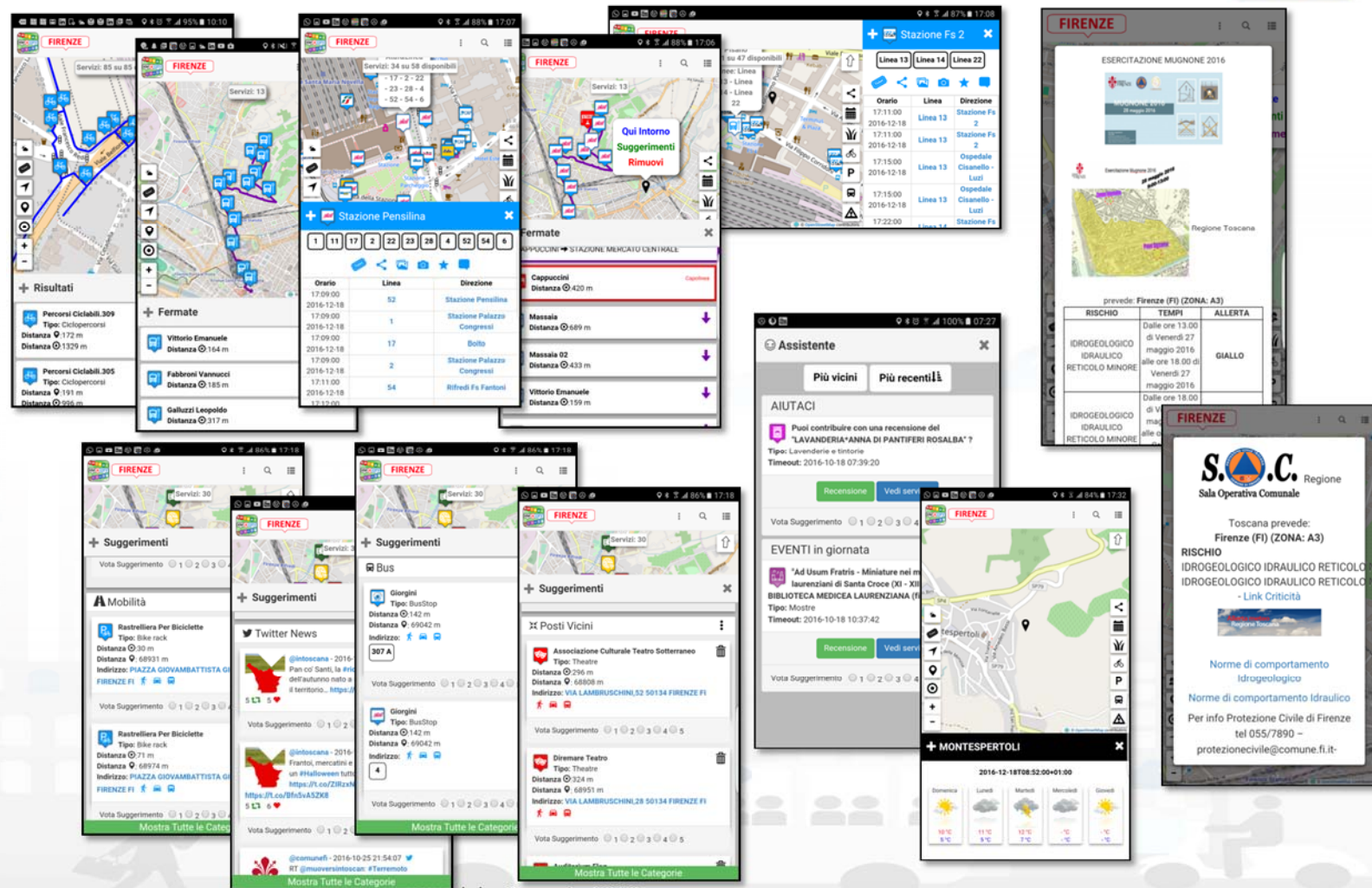
- Paths and stops, time
- Parking + prediction
- Ticketing
- Flow + prediction
- Navigation
- Connection with devices
- XXX Sharing

- **Personal Assistant**

- Info, Engagement
- Help, Civil protection

- **Suggestions:**

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



Free Parking PREDICTIONS



Careggi car park

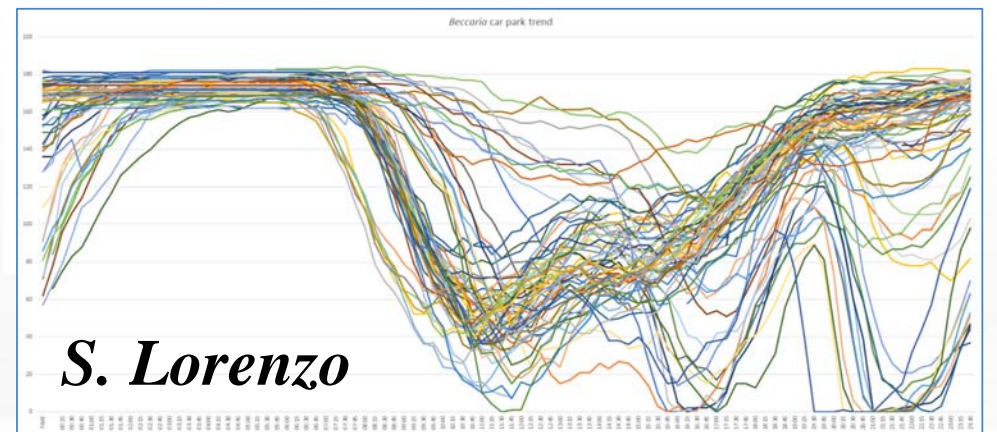
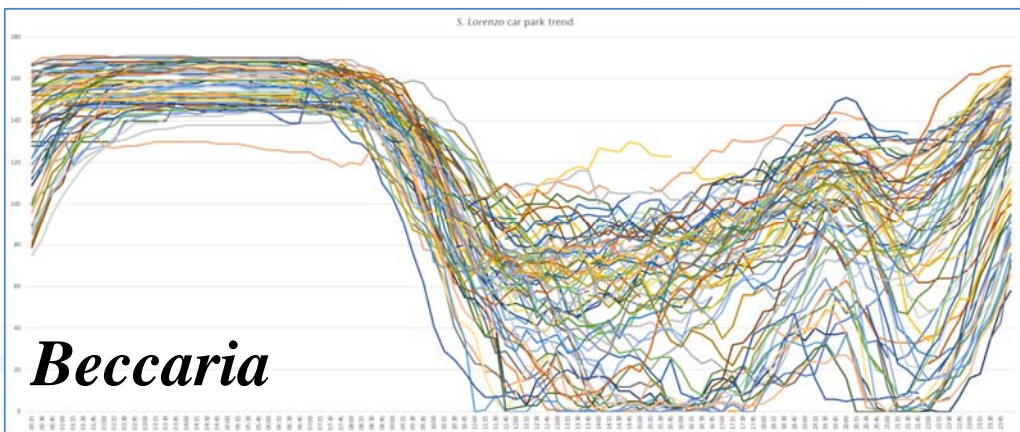
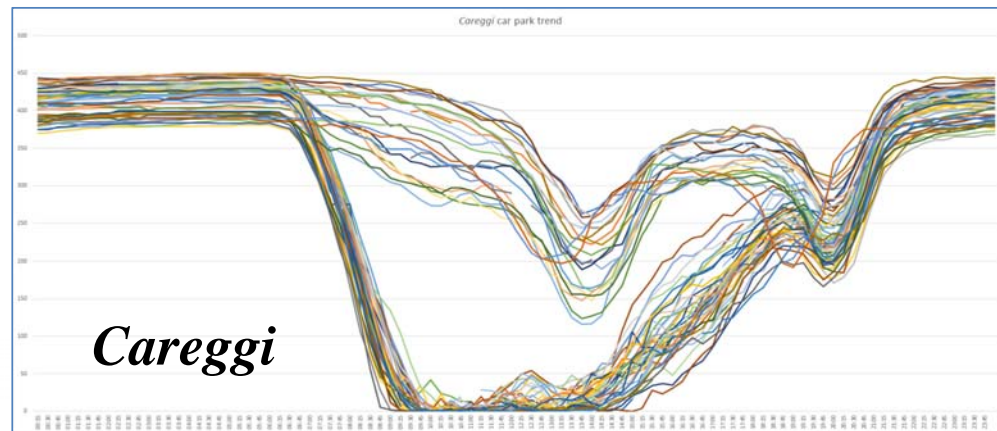
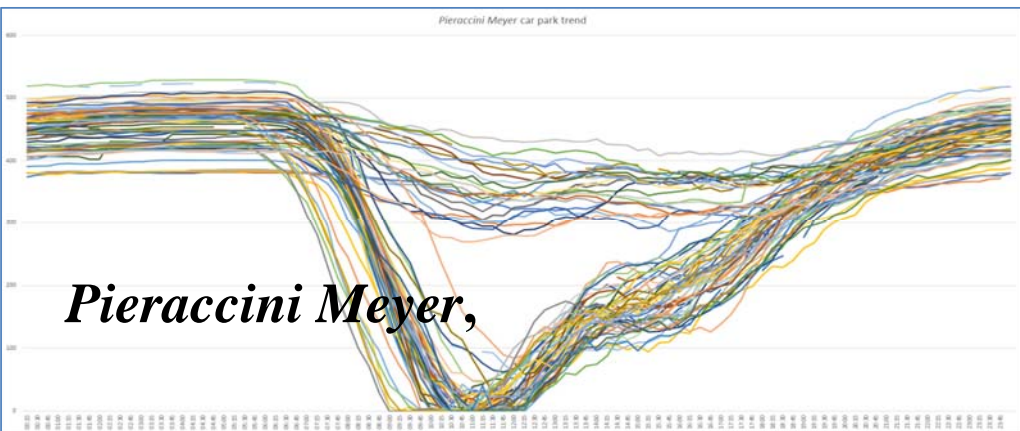
Model features	BRNN model results		
	R-squared	RMSE	MASE
Baseline	0.974	24	1.87
Baseline + Weather	0.975	24	1.75
Baseline + Traffic sensors	0.975	24	2.04
Baseline + Weather + Traffic sensors	0.975	24	1.87

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





Free Parking space trends



12 parking areas in Florence

DISIT lab, Gennaio 2018

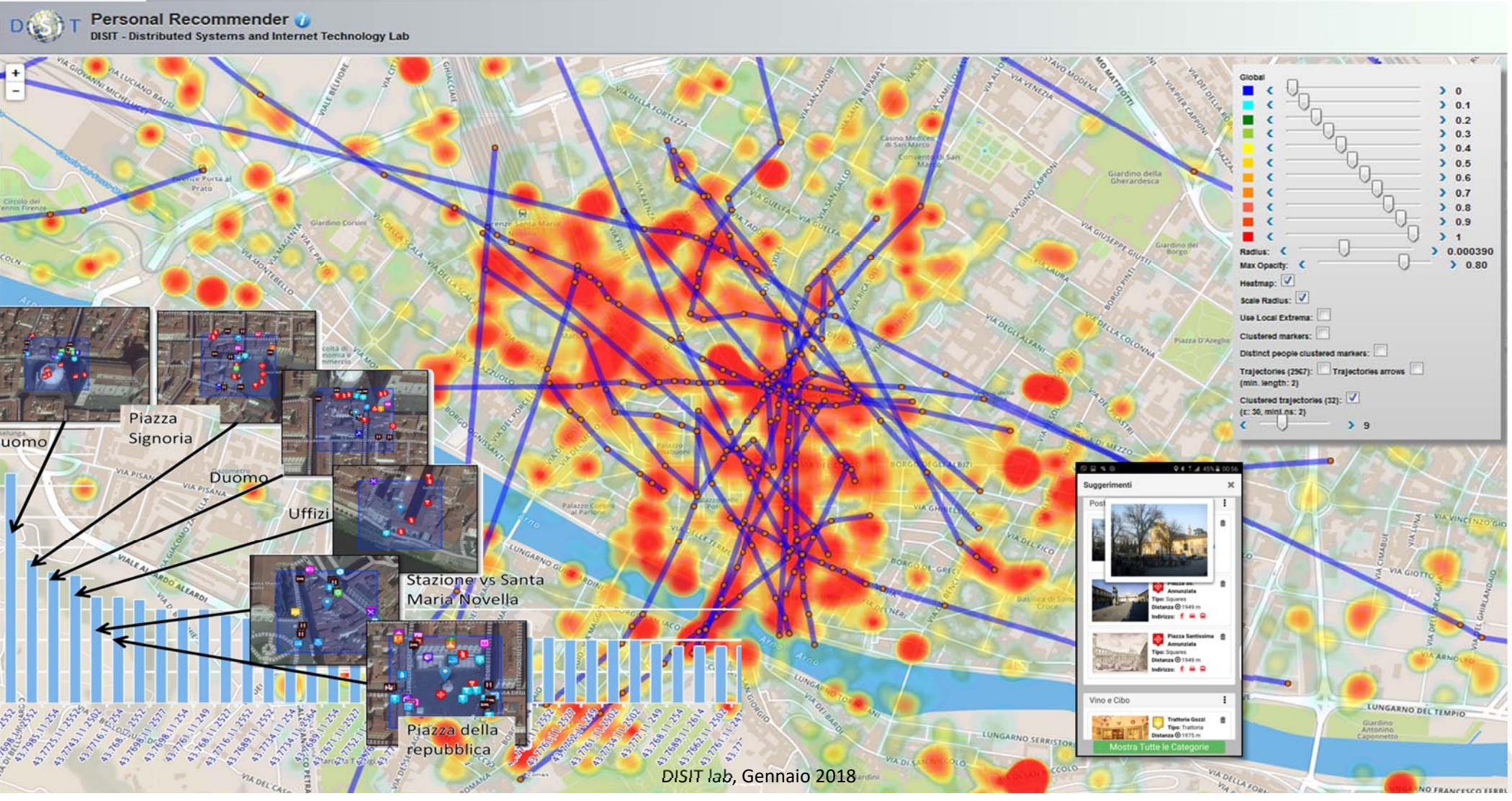


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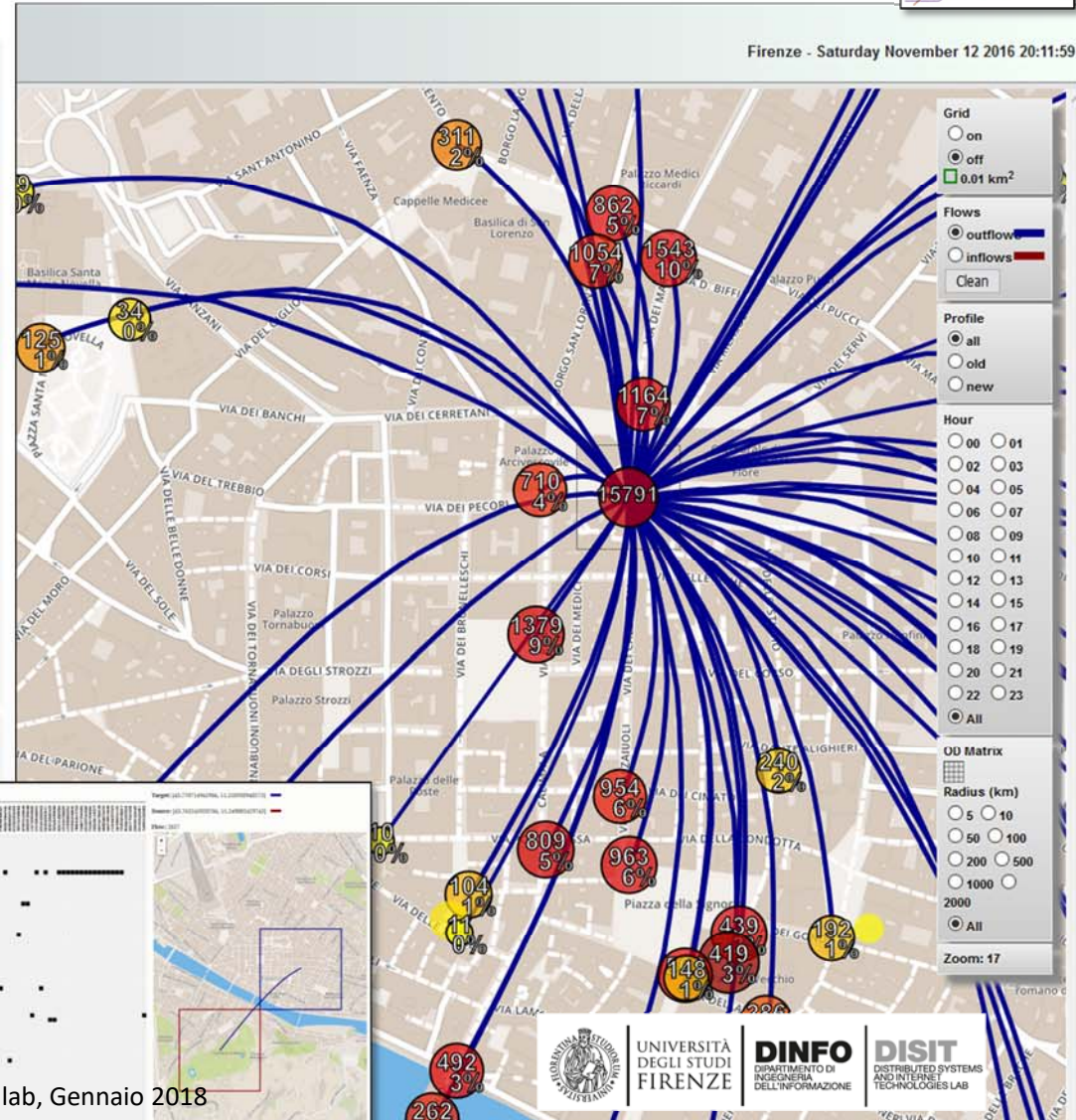
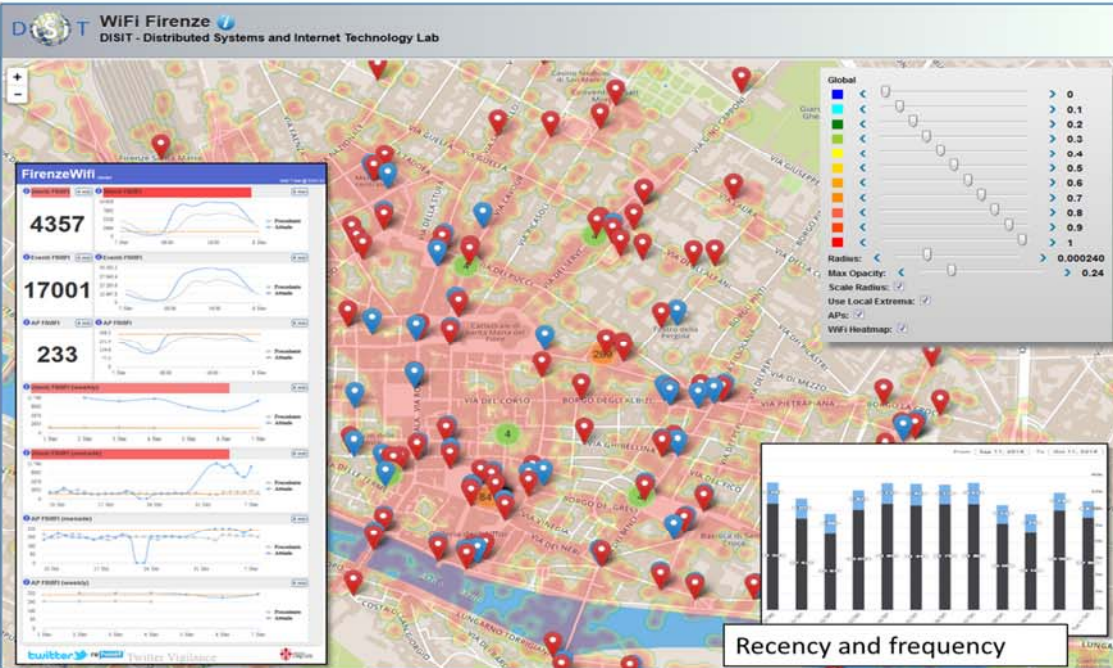
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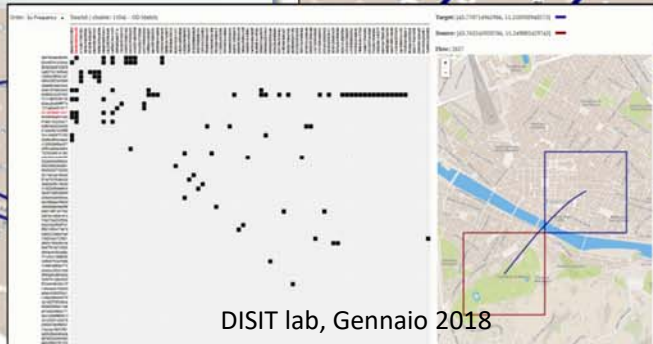
User Behavior Analyzer



Origin Destination Matrix Estimation



Wi-Fi based

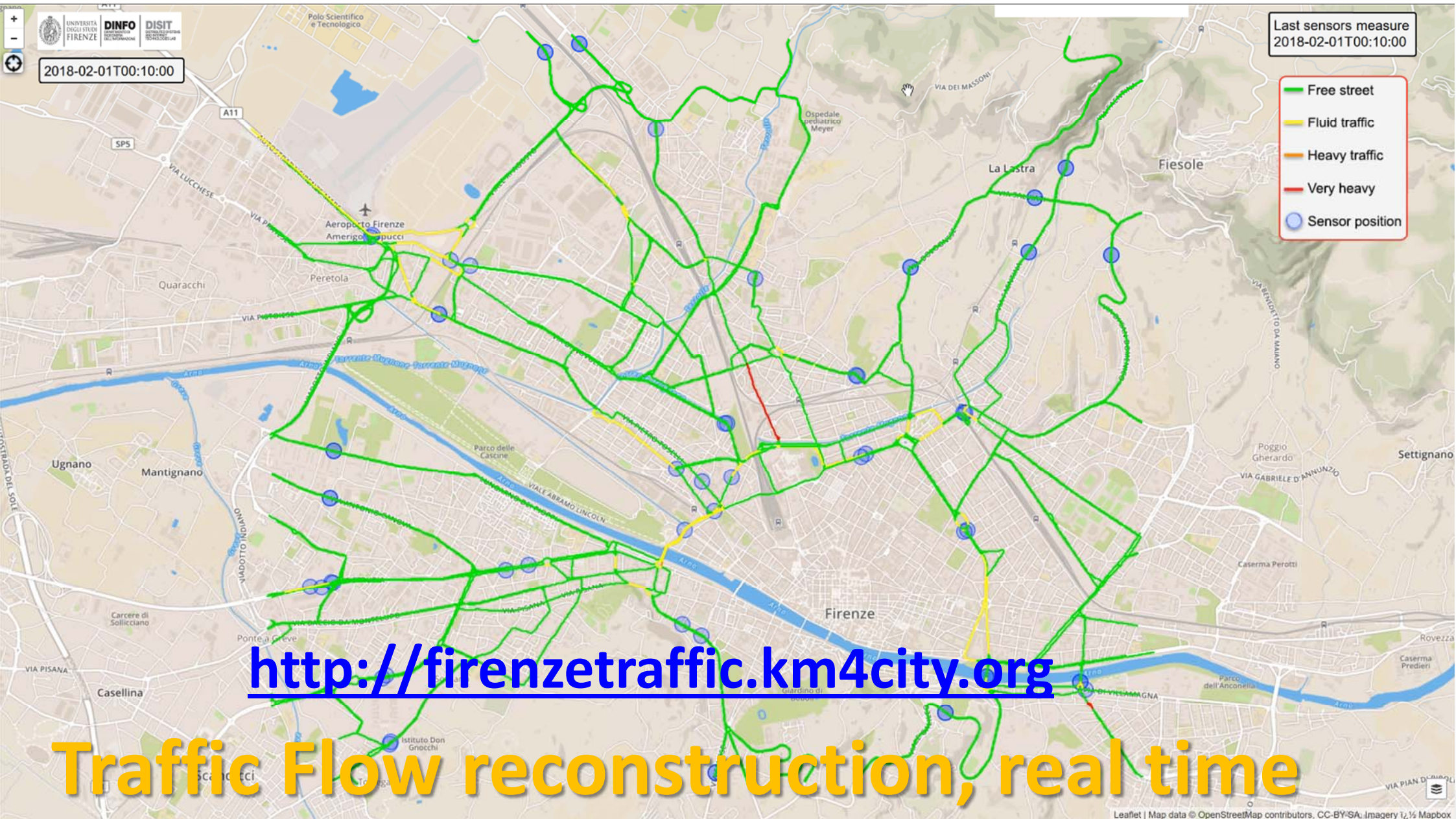


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Traffic Flow Tools

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

The collage illustrates various traffic flow tools and data visualizations. It features a map of Tuscany with red circular markers indicating specific locations. A 3D visualization shows a city with blue vertical bars representing traffic flow. A detailed map of Pisa shows red circular markers. A software interface screenshot displays a search bar and a list of service categories, including Regular Services and Transversal Services.



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2018-02-01T00:10:00

Last sensors measure
2018-02-01T00:10:00

- Free street
- Fluid traffic
- Heavy traffic
- Very heavy
- Sensor position

<http://firenzetraffic.km4city.org>

Traffic Flow reconstruction, real time



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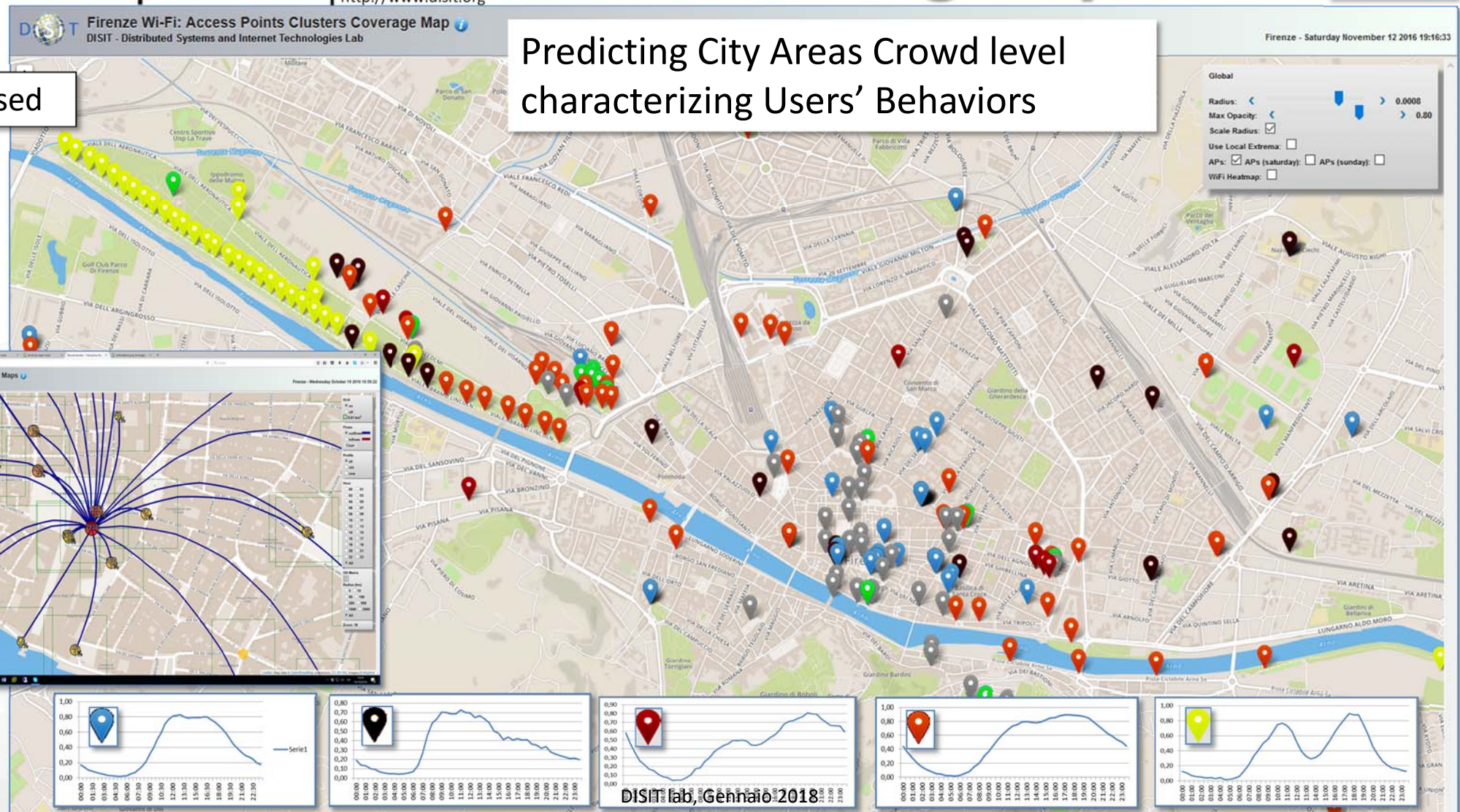
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Characterizing City Areas



Wi-Fi based

Predicting City Areas Crowd level
characterizing Users' Behaviors

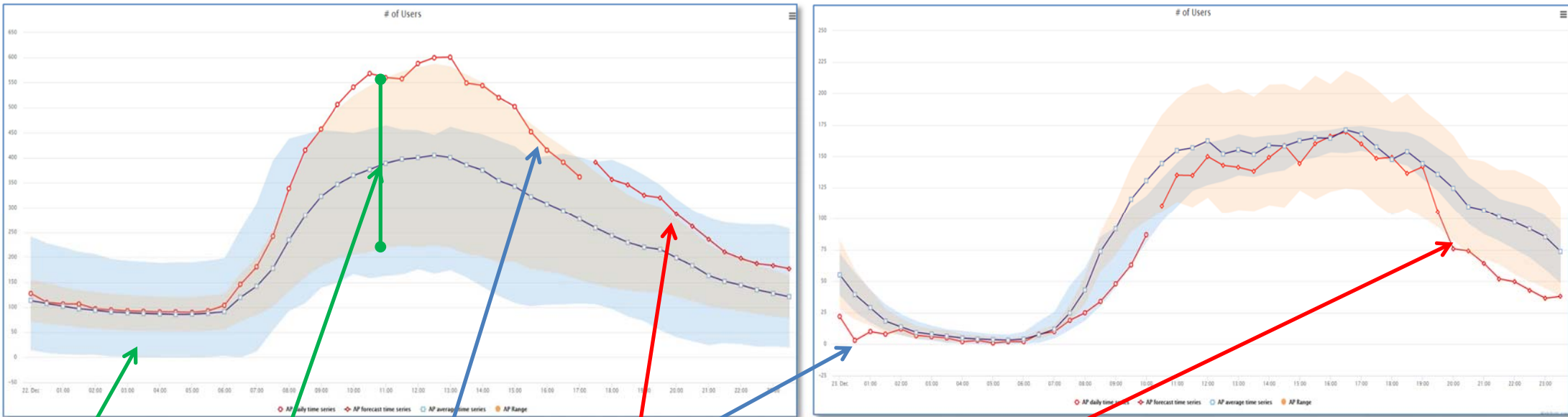


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Prediction and identification of anomalies



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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Routing Multimodale

The screenshot displays the KM4CITY multimodal routing application interface. The main map shows a route through Florence, Italy, starting from Piazza delle Cure and ending at Via Bruno Buozzi. The route is marked with bus stop icons and a red line. The interface includes a search panel on the left with filters for public transport, municipalities, text search, address search, and events. The search panel also shows the actual selection: Coord: 43.7560, 11.1914, Address: VIA BRUNO BUOZZI, 1/A, SCANDICCI. The search panel also shows the path from here and path to here. The search panel also shows the path via public transport and the start date and time: 2018-02-10 04:20. The search panel also shows the search path. The search panel also shows the found 2 paths (in 1.797s) with a length of 11198m and arrival time of 06:52:46 (02:31:55). The search panel also shows a list of 10 bus routes with their respective distances and arrival times.

Public transport | Municipalities | Text Search | Address 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
Coord: 43.7560, 11.1914
Address: VIA BRUNO BUOZZI, 1/A, SCANDICCI

Path from here | Path to here

Path
From: PIAZZA DELLE CURE, 22, FIRENZE
To: VIA BRUNO BUOZZI, 1/A, SCANDICCI
Route via: public_transport

Start date&time: 2018-02-10 04:20

Search Path

Found 2 paths (in 1.797s)

Length: 11198m arrival time:06:52:46 (02:31:55)

1. Piazza delle Cure 27m (04:20:00)
2. Viale dei Mille 249m (04:20:21)
3. Via Dogali 12m (04:23:38)
4. nd 134m (04:23:47)
5. 17 - Mille Pacinotti - Stazione Scalette 3115m (05:39:00)
6. 6 - Stazione Scalette - Pier Della Francesca Pisana 4166m (06:14:00)
7. Piazza Pier della Francesca 31m (06:27:00)
8. Via Antonio del Pollaiuolo 12m (06:27:25)
9. nd 35m (06:27:34)
10. Via Silvio Pellico 43m (06:27:50)

Regular Services | Transversal Services

Filter:
search text into service

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: N. results: 100

Search Range 100 mt

Search Area select...

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

<http://servicemap.km4city.org>



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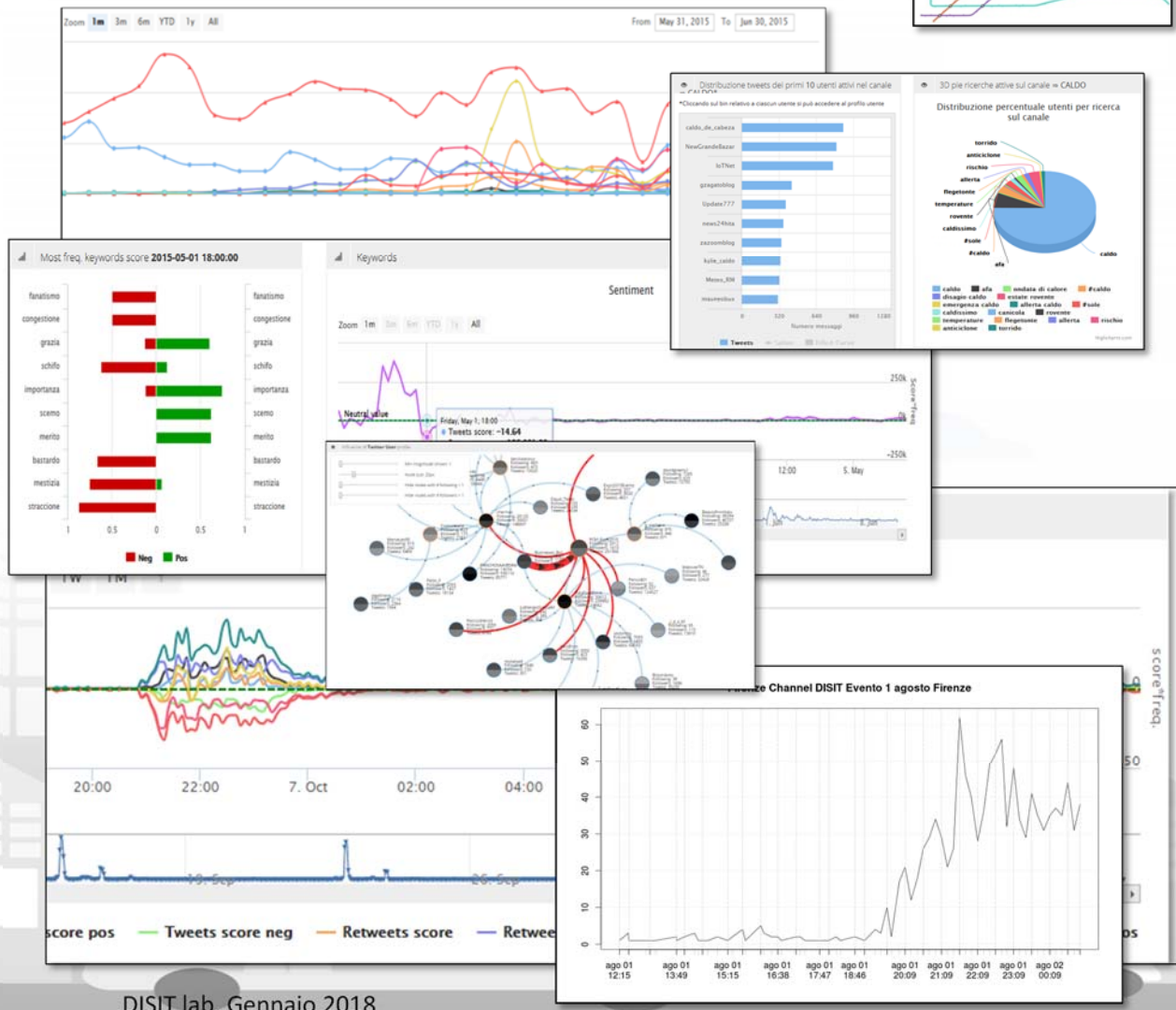
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Twitter Vigilance



- <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



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Twitter Vigilance su Firenze (sperimentale)

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

Channel active from 2009-02-27 to today

Data processed from 2015-05-22 to 2016-12-02

Search related to channel **Firenze**

Zoom 1m 3m 6m YTD 1y All

26. Nov 30. Nov 4. Dec 8. Dec 12. Dec 16. Dec 20. Dec 24. Dec

- #Accademia
- #Aeroporto #Firenze
- #Aeroporto #Firenze
- #bargello
- #expo2015 #Firenze
- #fiorentina
- #firenze
- #Florence #smartcity
- #fodd
- #ODDIT15 #Firenze
- #opendata firenze
- #pontevecchio
- #uffizi
- @acfflorentina
- @BandieraiUffizi
- @Biblio_ComuneFi
- @bncfirenze
- @comunefi
- @DarioNardella aeroporto
- @DiscoverTuscany
- @emergency_fi
- @firenzedigitale
- @firenzesulweb
- @FirenzeTNews
- @museofirenze
- @museonovecento
- @Nazione_Firenze
- @NicolodiDaria
- @novedafirenze
- @opentoscana
- @Pitti_Immagine
- @PoloMusealeFi
- @ProtCivComuneFi
- @prov_FI_PC
- @santacroceopera
- @STEEPproject
- @storianaturale
- @UNL_FIRENZE
- aeroporto firenze
- aeroporto firenze
- Firenze
- firenze terremoto
- firenzesulweb
- Firenze
- from:PUNL_FIRENZE
- lungarno
- medicea
- palazzopitti
- palazzostruzzi
- ProtCivComuneFi
- smartcity firenze
- torrigiani
- uffizi
- voragine
- Events

Daily number of tweets/retweets for channel: **Firenze**

Zoom 1m 3m 6m YTD 1y All

24... 26. Nov 28. Nov 30. Nov 2. Dec 4. Dec 6. Dec 8. Dec 10. Dec 12. Dec 14. Dec 16. Dec 18. Dec 20. Dec 22. Dec 24...

ReTweets Tweets Events

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

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

Sentiment trends in channel **Firenze**

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

07:30 07:45 08:00 08:15 08:30 08:45 09:00 09:15 09:30 09:45 10:00 10:15

Most Significant Tweets for Sentiment in the period

- @forealriesdaye - 2016-12-24 10:25:39
@Ahno_its_arno meh, I've only had average curry there
0 0 Sent. Score: 0.166667
- @esercizistorici - 2016-12-24 10:30:01
Stannoite Concerto di Natale di Peter Guth
@ORT_Toscana in collaborazione con Conservatorio 'L.Cherubini' di Firenze...
https://t.co/uFeTp4wG1y
0 0 Sent. Score: 0
- @infointerno - 2016-12-24 10:30:05
Firenze, un piano per un Natale sicuro (055firenze) https://t.co/vpqDASEspI 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/cM84Gw65sO
0 0
- @MORINEMMANUELL2 - 2016-12-24 10:30:14
RT @NavyMat: Francesco #Salvati Carità,1543 #Manierisme Galleria degli Uffizi, Firenze @ChevernyM @mariairenali @piroBENEDETTO @Giusepp...
6 0
- @infointerno - 2016-12-24 10:30:12

Twitter Vigilance

TRENDS QUOTES

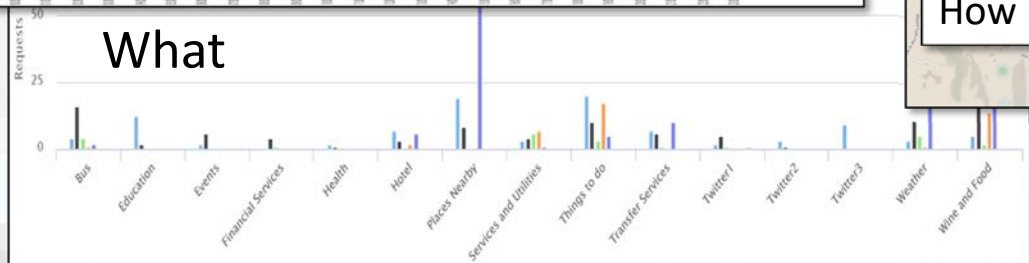
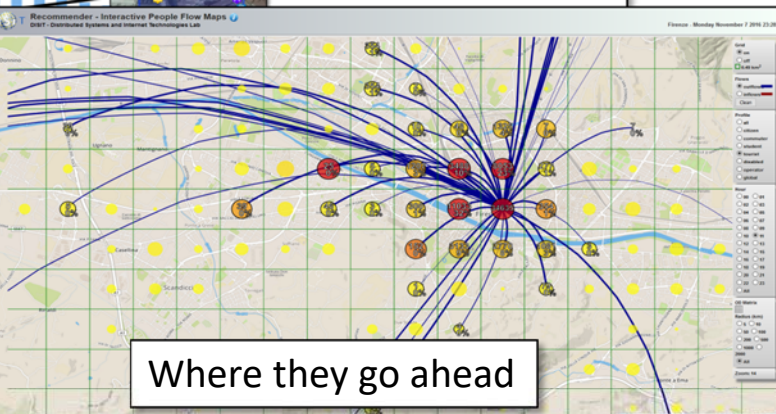
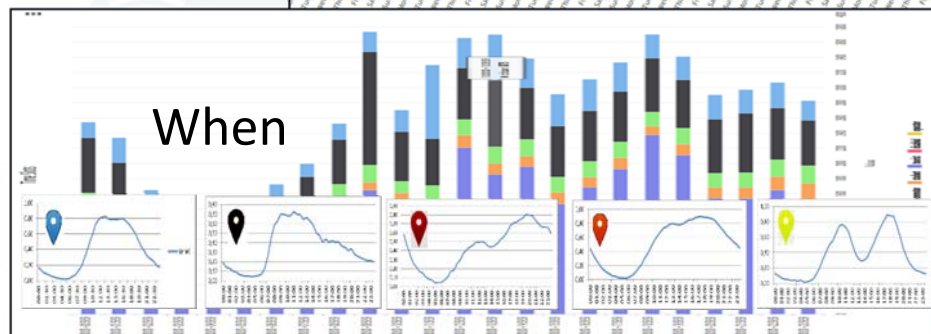
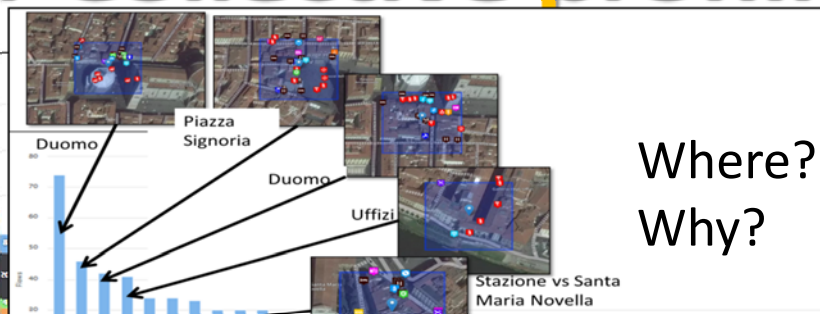
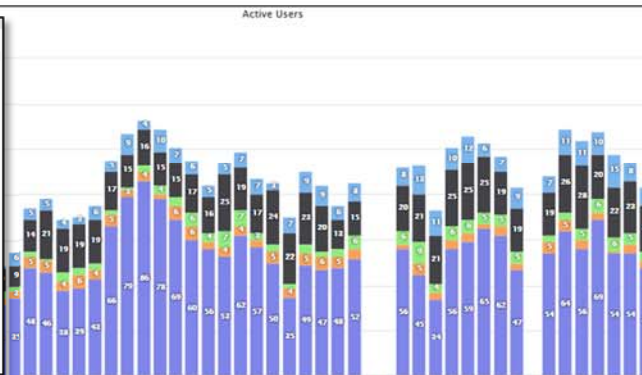
- @NICOLODIDARIA
- @COMUNEFI
- @ACFFIORENTINA
- @NAZIONE_FIRENZE
- @SANTACROCEOPERA
- @MUSEONOVECENTO
- @FIRENZEDIGITALE

TRENDS QUOTES

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

We suggest to use Chrome browser for better experience

User Behavior Analyzer for Collective profiling





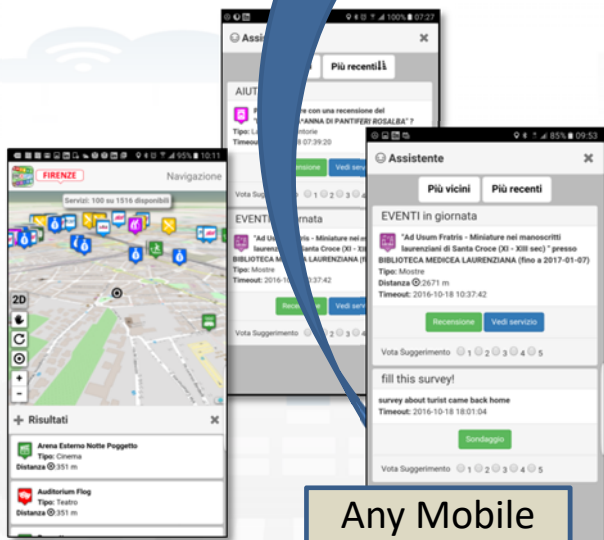
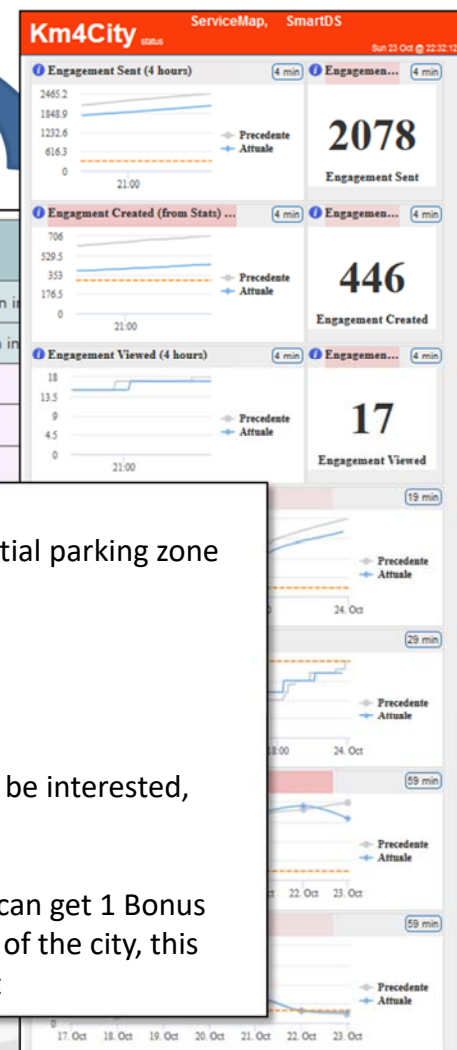
User influencing, engaging, monitoring & Follow Up



City & City Operators Strategy Editor



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 i
daily_event_en	ENGAGEMENT	1720 (2.12%)	70 (7.1%)	4.07%	Suggest (in english) an event currently on i
- 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%)			
- operator		0 (0%)			
- 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

Development

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



DISIT lab, 15 August 2017



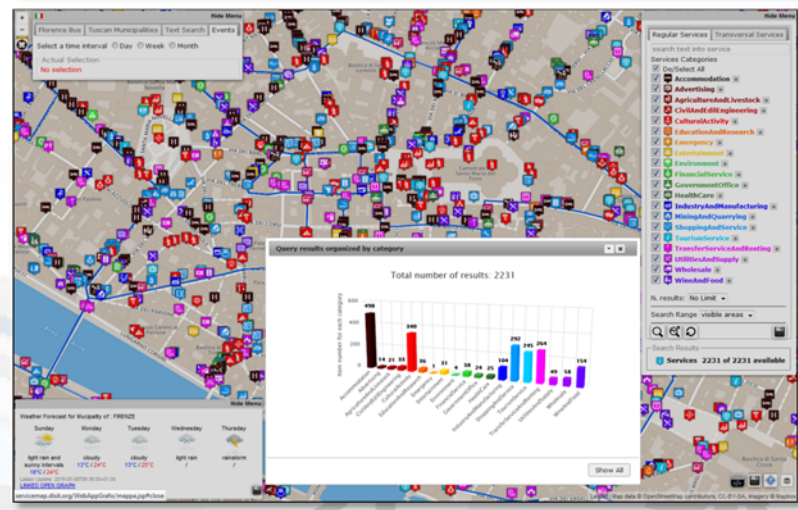
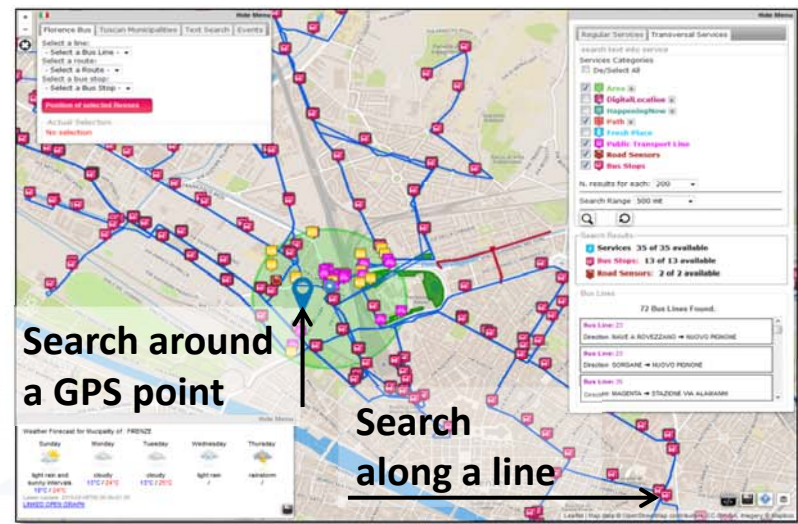
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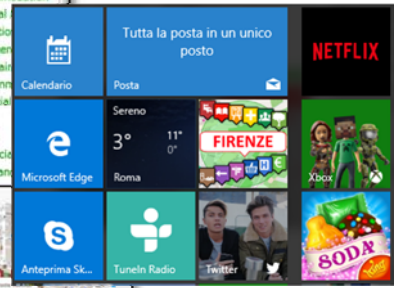
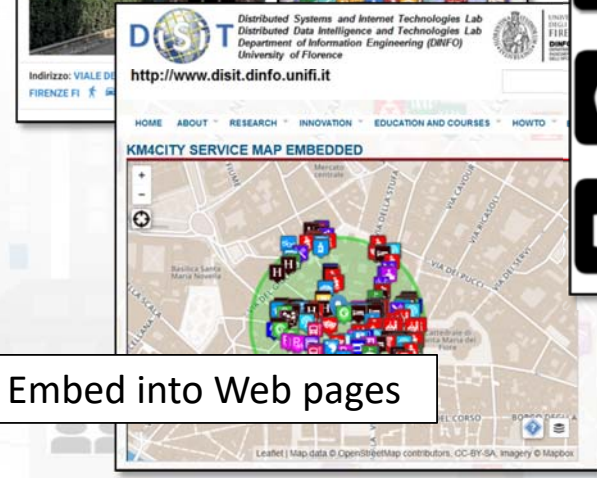
ServiceMap Dev Tool



Smart City API call generation



Embed into Web pages





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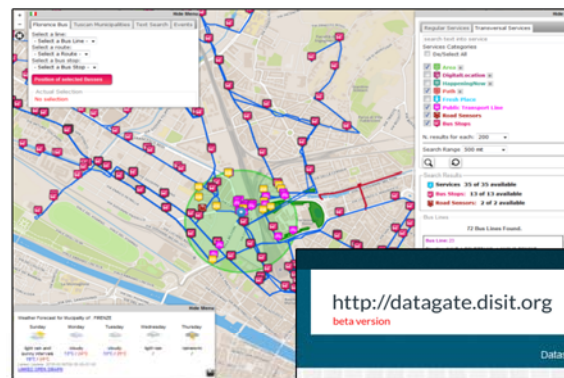
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Providing Development tools



- Generating API Call: ServiceMap
 - Navigating on maps
 - Navigating on the semantic model worldwide
- Loading Data via DataGate tool
- Creating Widgets: dashboard builders, ServiceMap3D, MicroApplications





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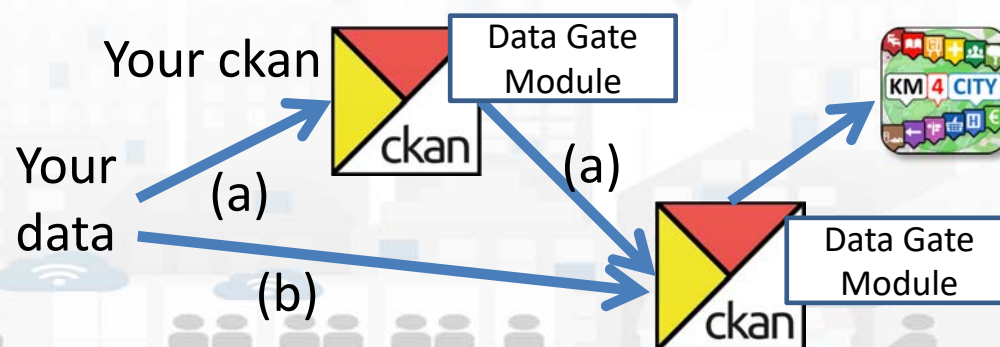
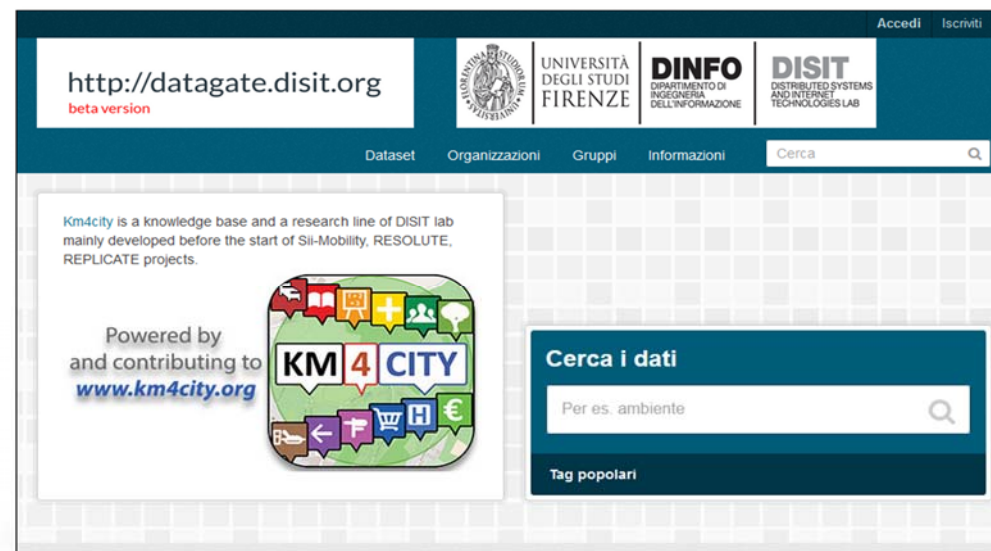
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<http://www.disit.org>

<http://DataGate.disit.org>



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>





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TECHNOLOGIES LAB
<http://www.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 Map It! Clear Map

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



Linked Open Graph

SiiMobility (by DISIT)

Examples:

- VIA_GIACOMO_MATTEOTTI
- Bagno_a_ripoli
- Florence

Choose a class:

Search for keyword

keyword:

uri: Request

Your data

sparql endpoint: (optional)

uri: Request

Status

Requests:

Remove Clear

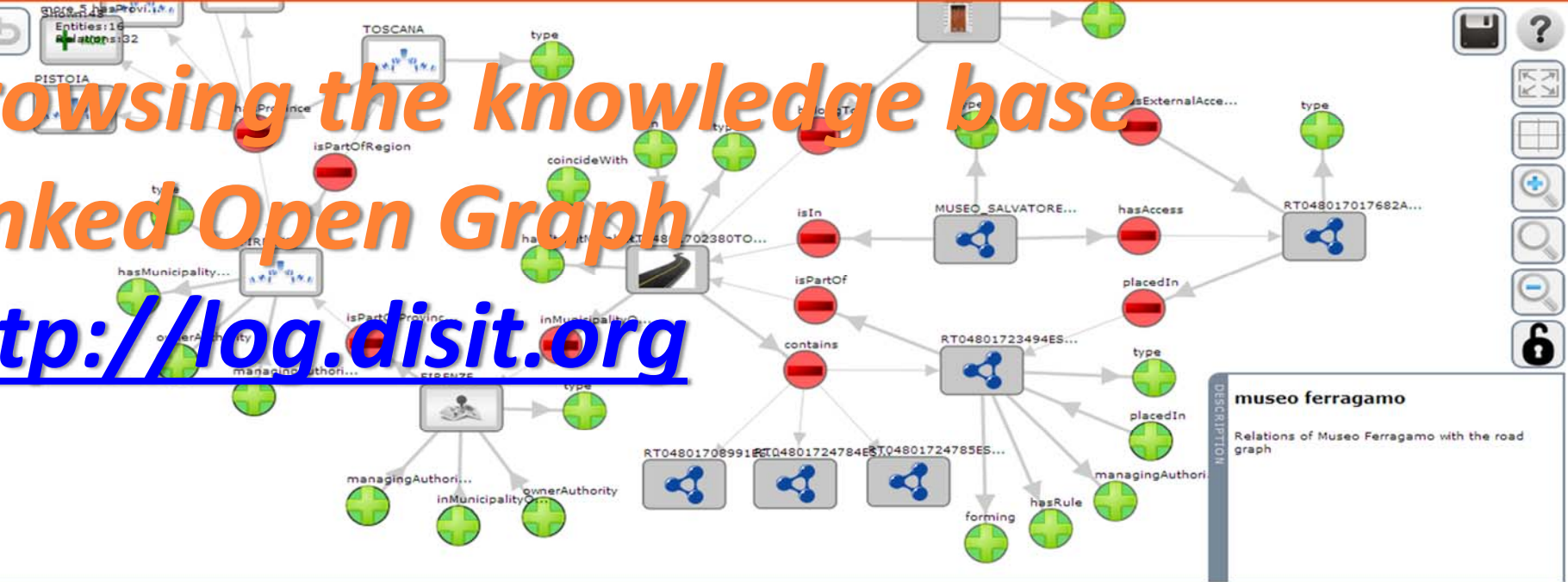
Type of relations

Select all Deselect all Invert Hide all inverse

<input checked="" type="checkbox"/> belongTo	<input checked="" type="checkbox"/> coincideWith
<input checked="" type="checkbox"/> contains	<input checked="" type="checkbox"/> depiction
<input type="checkbox"/> ends	<input checked="" type="checkbox"/> forming
<input type="checkbox"/> has	<input checked="" type="checkbox"/> hasAccess
<input checked="" type="checkbox"/> hasExternalAccess	<input checked="" type="checkbox"/> hasMunicipality
<input checked="" type="checkbox"/> hasProvince	<input checked="" type="checkbox"/> hasRule
<input checked="" type="checkbox"/> hasStreetNumber	<input checked="" type="checkbox"/> inMunicipalityOf
<input checked="" type="checkbox"/> isIn	<input checked="" type="checkbox"/> isPartOf
<input checked="" type="checkbox"/> isPartOfProvince	<input checked="" type="checkbox"/> isPartOfRegion
<input checked="" type="checkbox"/> managingAuthority	<input checked="" type="checkbox"/> ownerAuthority
<input checked="" type="checkbox"/> placedIn	<input type="checkbox"/> sameAs
<input checked="" type="checkbox"/> seeAlso	<input type="checkbox"/> starts

Linked Open Graph

Browsing the knowledge base
 Linked Open Graph
<http://log.disit.org>



Navigation icons: Save, Help, Full Screen, Grid, Zoom In, Zoom Out, Home, Lock

museo ferragamo

Relations of Museo Ferragamo with the road graph



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<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**

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

```

Samples SPARQL Properties Classes Prefixes

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; Cancel; Query Results; Visualize; Load

#	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

Trasporti a Firenze

Trasporti + San Marco Rettorato

Servizi: 9 su 9 disponibili

San Marco Rettorato Ataf&Linea

Orario	Linea	Direzione
23:39:00	4	San Marco Rettorato
23:45:00	4	Cappuccini
00:24:00	4	San Marco Rettorato
00:30:00	4	Cappuccini
06:07:00	4	San Marco Rettorato
06:11:00	4	Cappuccini
06:27:00	4	San Marco Rettorato
06:32:00	4	Cappuccini
06:49:00	4	San Marco Rettorato
06:53:00	4	Cappuccini

Aggiorna Vedi Tutti

Cosa ne pensi del servizio?

Vota

★★★★★ 0

Commenta

previsioni

Fri 9 Feb Cloudy

Sat 10 Feb -3°C / 9°C Bit cloudy

Sun 11 Feb -3°C / 11°C Bit cloudy

Mon 12 Feb Temp N/A Light rain and sunny intervals

Tue 13 Feb Temp N/A Cloudy

Powered by LaMMA

4°C / 12°C

Cycling-

Risultati

Percorsi Ciclabili.148

Ciclopercorsi

167 m

Servizi: 1 su 1 disponibili



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Embedded Widgets



DESTINATION FLORENCE
Destination Official Partner del Comune di Firenze

Visitare Vivere Dormire Mangiare Tour Eventi Servizi Blog

COME MUOVERSI

Fermate bus Piste ciclabili Parcheggi Distributori

Powered by www.km4city.org

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>

vis| qualsiasi tipo| deep search

HOME ABOUT RESEARCH INNOVATION EDUCATION AND COURSES HOWTO EVENTS

Log in/Create account

Sort by Relevance Sort by Upload Sort by Update

RISULTATI DELLA RICERCA

(1-10 of 857 in 2723 ms)

DISIT in difficoltà per la neve nel 2010!
DSI DISIT nel 2010, problemi di neve!

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DINFO Dipartimento di Ingegneria dell'informazione

Informazioni sui mezzi di trasporto pubblico disponibili, per una mobilità sostenibile nell'ateneo fiorentino

Scegli il raggio di ricerca - Choose the search distance

Cerca 0 m 1 km 2 km

Vista iniziale First view Km4city WebApp Indicazioni stradali - Directions

Scegli altri servizi da visualizzare
Choose other services to show

- Rastrelliere bici - Bike racks
- Piste ciclabili - Cycle paths
- Strutture UNIFI - UNIFI Depts
- Linee Tpl - Bus routes

Clicca sul nome della fermata qui sotto per avere il dettaglio delle linee

Click the stop name for more details on the routes

- Massaia 4
- Massaia 02 4
- Cappuccini 4
- Mercati 4
- Incontri 40

Rilevanza 0,35

ella conoscenza, anal...
dati e conoscenze mining,
gio naturale, intelligenza artificiale,

Rilevanza 0,3

alisi comparativa dei ...
tion system and besides it, the
e key issues such safety of the

Rilevanza 0,3

i di sistemi collaborat...
ti, e benefici per gli studenti del
digitali, DRM e CAS Parte 2:

Rilevanza 0,28

onica su Smart City: ci...
rastruttura elaboratori periferici
deduzione Processori Recitazione

Rilevanza 0,28

turismo e la formazio...
minerario, gestione delle
gestione dei dati;? strumenti per il

Rilevanza 0,28

Multiple SPARQL entry ...
essibili popolano il mondo linked
dati sta diventando ogni giorno

FILTRI DI RICERCA

CONTENUTI

- In primo piano
- Most Viewed (last 500)
- Most Viewed All (last 500)
- Ultimi caricati
- Più votati
- Risultati della Ricerca

CLASSIFICAZIONE

Lista dei termini

- application.fields (3425)
- content kind (962)
- models and systems (3014)
- project kind (809)
- research topics (7453)
- standard (501)

Ven 26 Gen Powered by LaMMA

Firenze

Nuvoloso 5°C / 10 °C

Sab 27 Gen 1°C / 14°C	Dom 28 Gen 1°C / 15°C	Lun 29 Gen Temp N/A	Mar 30 Gen Temp N/A
Sereno	Sereno	Nuvoloso	Coperto

Powered by www.km4city.org



DISIT Lab, Gennaio 2010



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Scenariious vs SmartCity API

- Search data: by text, near, along, etc...
 - Resolving text to GPS and formal city nodes model
- Empowering the city users
- Access to event information
- Supporting City Users in using Public Mobility
- Supporting City Users in using Private Mobility
- New Experience to access at Cultural and Touristic info
- New way to access at health services
- Access at Environmental information
- Profiled Suggestions to City Users
- Personal Assistant
- Sharing knowledge among cities



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<http://www.disit.org>

<http://www.disit.org/7109>



Magari siete interessati a lavorare al DISIT

BANDO: 2 POSTI ASSEGNISTA, STUDIO E SVILUPPO DI SOLUZIONI PER L'INTERNET DELLE COSE, IOT/IOE, PER VARI AMBITI APPLICATIVI

TITOLO: Studio e sviluppo di soluzioni per l'Internet delle cose, IOT/IOE, per vari ambiti applicativi (*in inglese*) Study and development of solutions for Internet of Thing/Everything for different applications scenarios

Il Bando e le istruzioni possono essere scaricate da

<https://titulus.unifi.it/albo/viewer?view=files%2F002633971-UNFICLE-9ea2d448-2dd3-41e8-a41b-912a8ccfb3-000.pdf>

Campo principale della ricerca ICT

Sottocampo della ricerca Sistemi distribuiti, IOT, Big data

Area CUN 09

Settore Scientifico Disciplinare ing/inf05

Descrizione sintetica in italiano

L'assegnato di ricerca ha come obiettivo lo studio e lo sviluppo di soluzioni distribuite basate su microservizi l'elaborazione dati in ambito internet of thing/everything, IOT/IOE. Lo studio sarà orientato allo sviluppo di soluzioni su architetture distribuite (hadoop, spark, GPU, cloud, nodeRED) per la gestione di processi e la raccolta dati su architetture parallele, con modelli di scaling su VM/cloud e container, processi big data di data mining (modelli predittivi e di identificazione di anomalie), soluzioni di machine learning. Il lavoro si svolge nel contesto dei progetti Snap4City/Select4Cities H2020 (<http://www.disit.org/7113>) (Su Helsinki e Antwerp), Coll@bora del MIUR, Sii-Mobility <http://www.sii-mobility.org> MIUR (su tutta la regione Toscana), <http://www.km4city.org> (su Venezia) e WEEE LIFE della EC (<http://www.disit.org/7114>) su Firenze, REPLICATE H2020 e RESOLUTE H2020 su Firenze. Molti di questi progetti sono in collaborazione con importanti partner nazionali ed internazionali come: Leonardo, Thales, ECM, SWARCO, TIM, ENEL, etc., e moltissimi centri di ricerca (ENEA, CNR, UNIMI, UNICA,) e pubbliche amministrazioni: Firenze, Helsinki, Compenaghen, Antwerp, Pisa, Venezia, Cagliari, etc.

L'assegnista si troverà ad avere compiti specifici che potrà sviluppare in modo autonomo e al contempo ad

Using and Contributing to Km4City



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DISIT lab, Gennaio 2018



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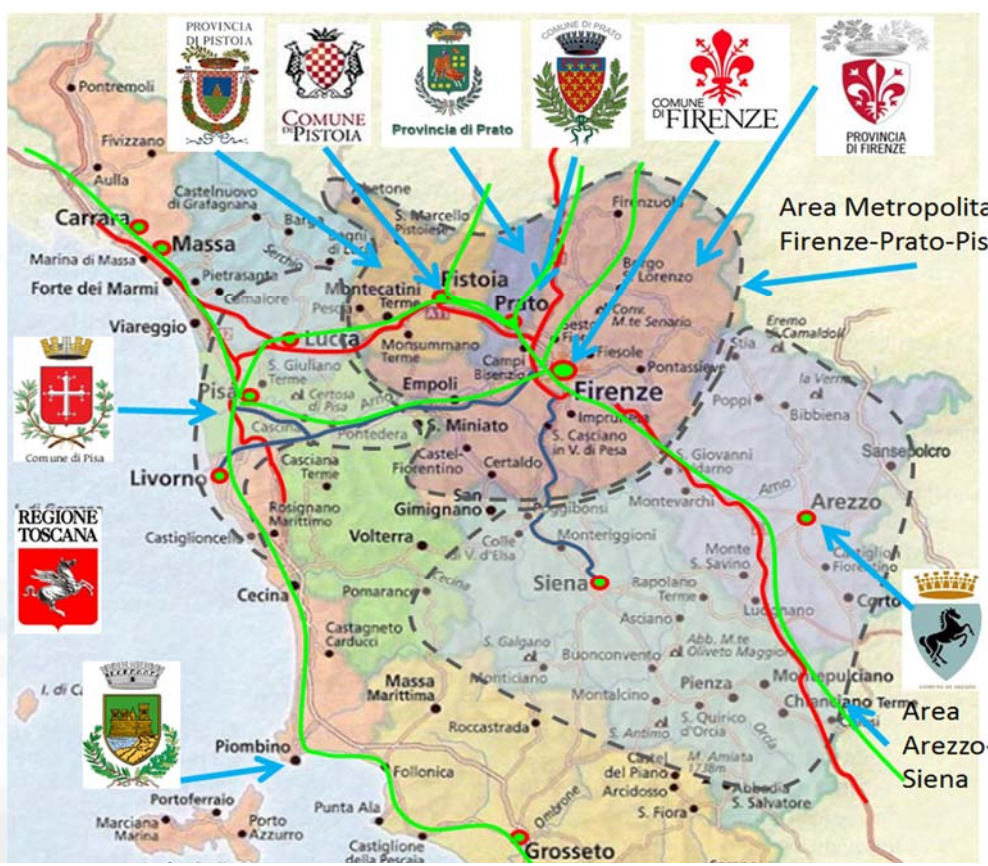
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Sii-Mobility

<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
- Autostrade
- SS Fi-Pi-Li
- SS Fi-Si
- Ferrovie (primarie)
- - Aree
- 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*



Horizon 2020
European Union Funding
for Research & Innovation

<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 DIF**
- 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 SYSTEMS, 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

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- Thanks to the European Commission for founding. All slides reporting logo of **REPLICATE H2020** are representing tools and research funded 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 program (grant agreement n° 691735).
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- Thanks to the European Commission for founding. All slides reporting logo of **Snap4City** <http://www.snap4city.org> of **Select4Cities H2020** are representing tools and research funded by European Commission for the **Select4Cities** project. **Select4Cities** has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program (grant agreement n° 688196)
- **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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Smart Cities



Piattaforma Km4City

<http://www.disit.org/km4city>
Paolo Nesi, paolo.nesi@unifi.it

www.Km4City.org

<http://www.disit.org/7139>





OPENDATA

