



UNIVERSITÀ  
DEGLI STUDI  
FIRENZE

**DINFO**  
DIPARTIMENTO DI  
INGEGNERIA  
DELL'INFORMAZIONE

**DISIT**  
DISTRIBUTED SYSTEMS  
AND INTERNET  
TECHNOLOGIES LAB

**(Orientamento 2016)**

**Distributed Data Intelligence and Technologies Lab**  
**Distributed Systems and Internet Technologies Lab**

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

[paolo.nesi@unifi.it](mailto:paolo.nesi@unifi.it) , <http://www.disit.dinfo.unifi.it/nesi/>

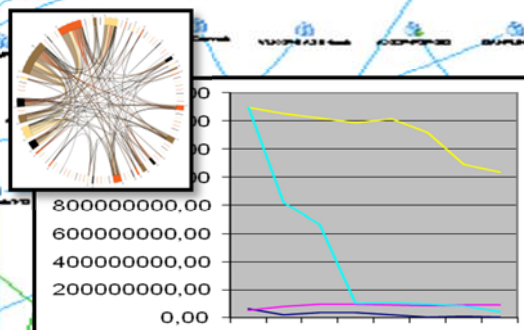
# Overview delle slide

- **Argomenti di Ricerca** 
- Collaborazioni con imprese e Centri di Ricerca
- Tesi ed Elaborati
- CDL Magistrale
- Altri Corsi

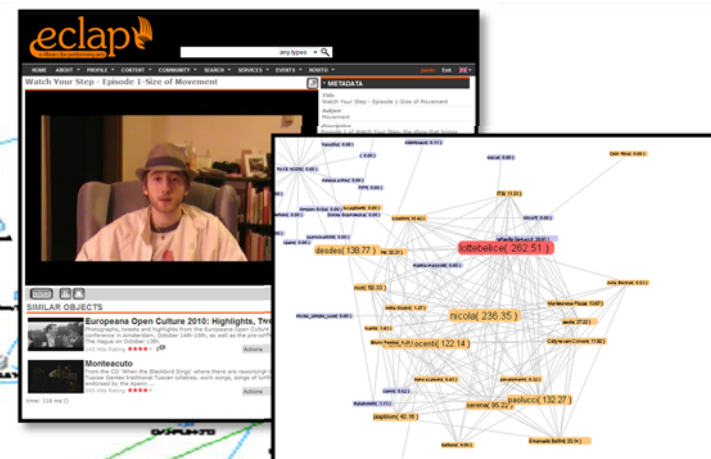


<http://www.disit.dinfo.unifi.it>

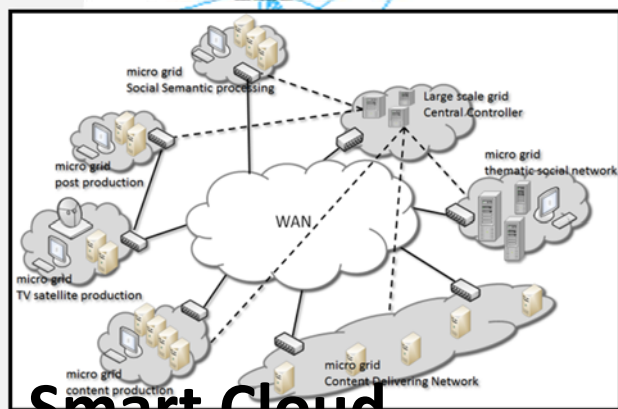
## Text and Web Mining



## Data Analytics Big data



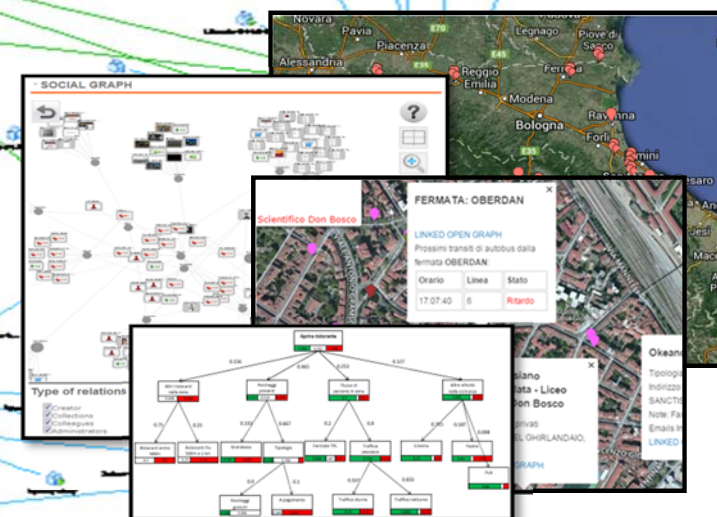
## Social Media, e-learning



## Smart Cloud Computing

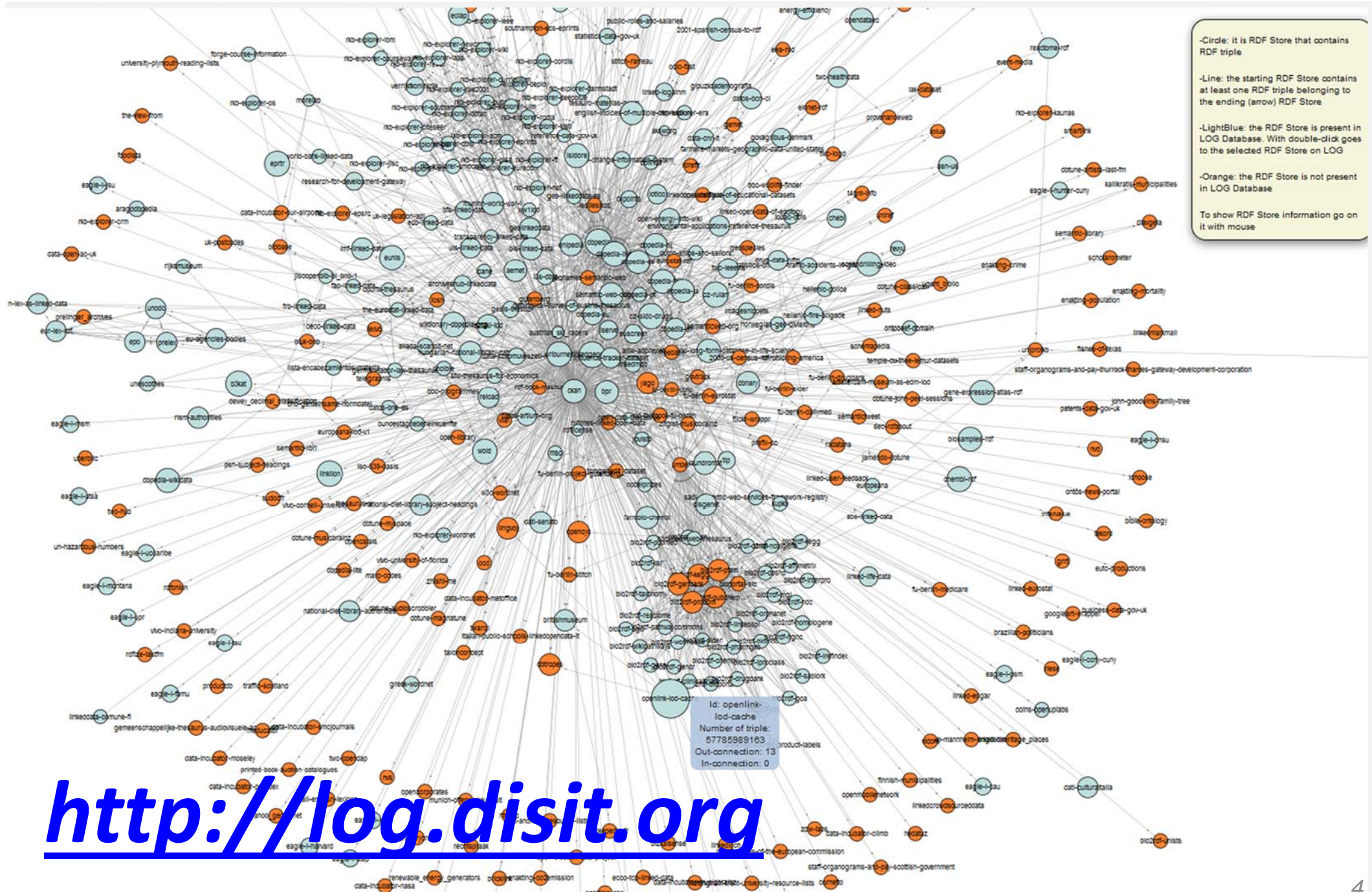


## Mobile Computing



## Smart Cities







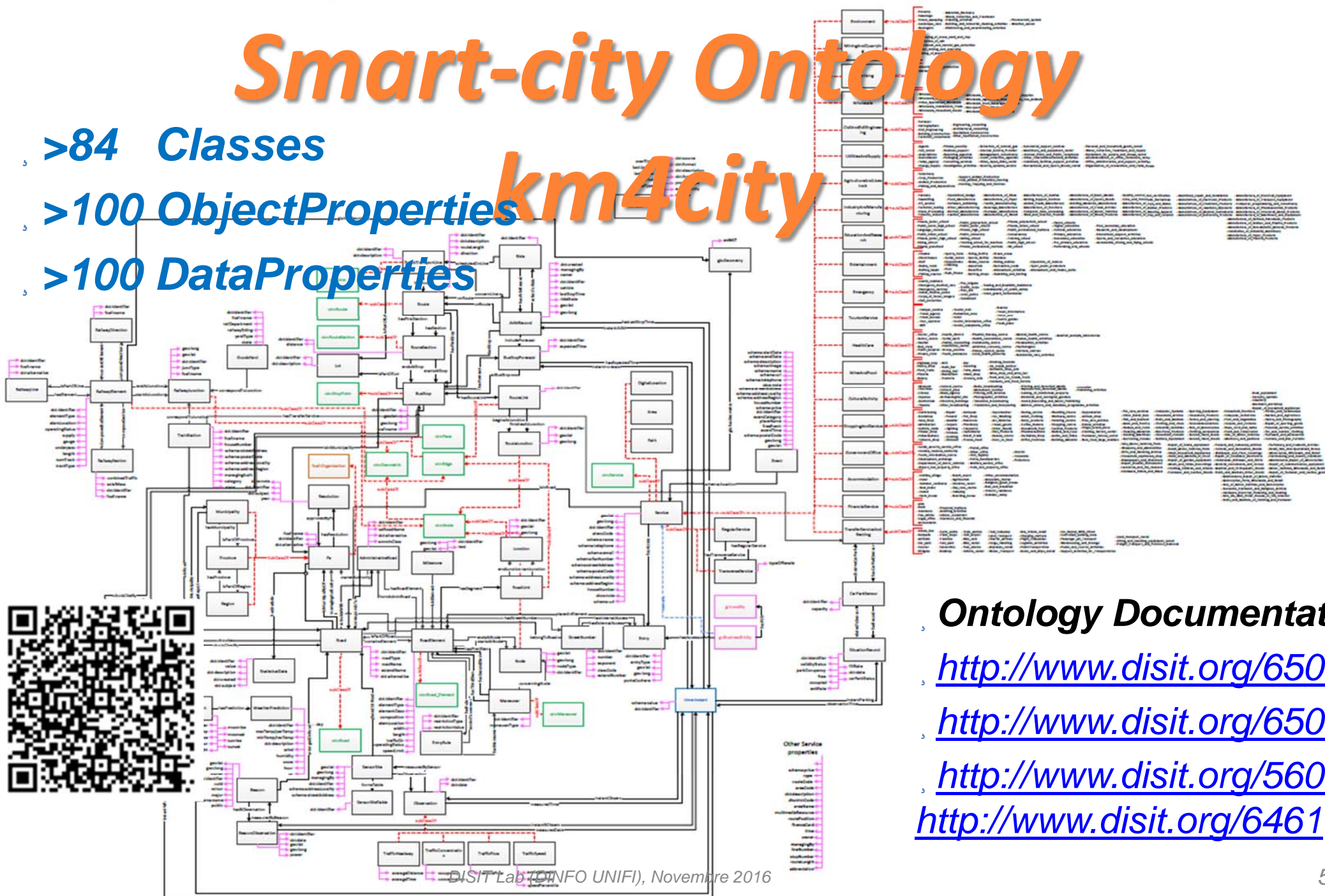
# Smart-city Ontology

>84 Classes

>100 ObjectProperties

>100 DataProperties

km4city



Ontology Documentation

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

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

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

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





# Km4City in Tuscany Area

**Road Graph (Tuscany region)**

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

**Services (20 cat, 512 cat.)**

- 16 Pub. Transport Operators
- 21.280 Bus stops & 1081 bus lines
- 210 Parking areas
- 796 Traffic Sensors
- more than 2000 IOT sensors
- Info on: points, paths, areas, etc.

**Dynamic/real-time**

- bus lines: 144 updates X day X line
- parking status: 76 updates X day X sensor
- traffic Sensors: 288 updates X day X sensor
- weather: 2 updates X day for 285 areas
- events: about 60 new events X day
- Wi-Fi: > 350.000 measures X day
- mobiles: > 50.000 measures X day
- more than 35.000 distinct users X day

From 600.000 to 4.5 M Tweets X day

**Previsioni Mete per il comune di FIRENZE:**

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

Ultimo Aggiornamento: 2015-09-15T09:07:00+02:00  
[LINKED OPEN GRAPH](#)

**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 +

Risultati della ricerca

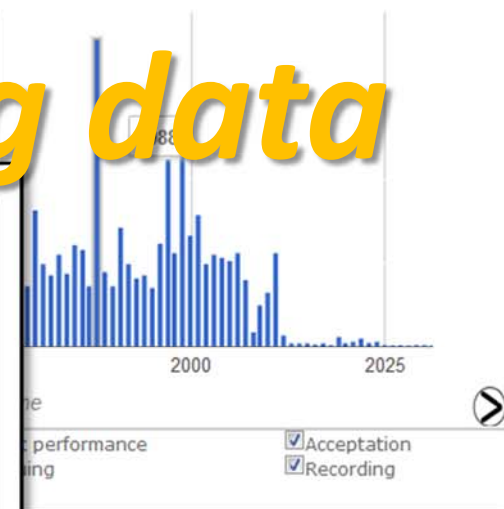
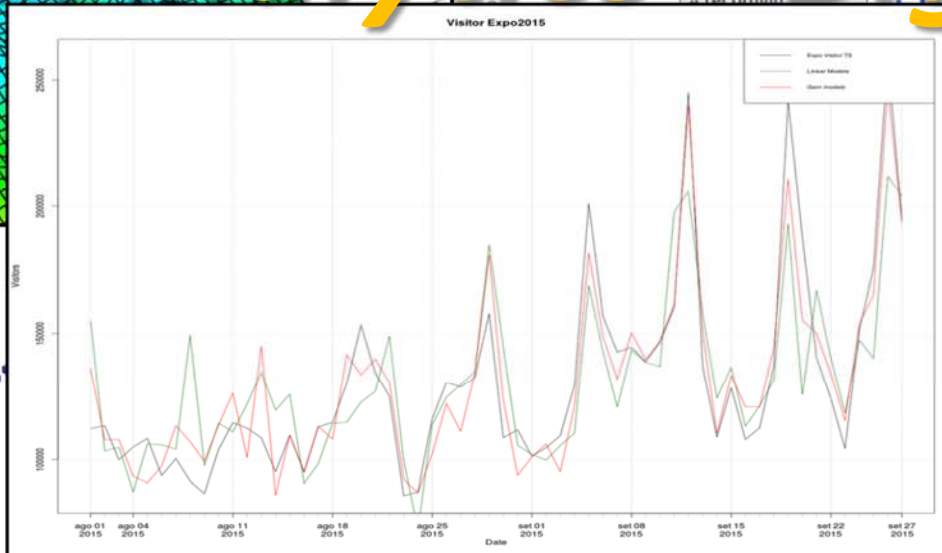
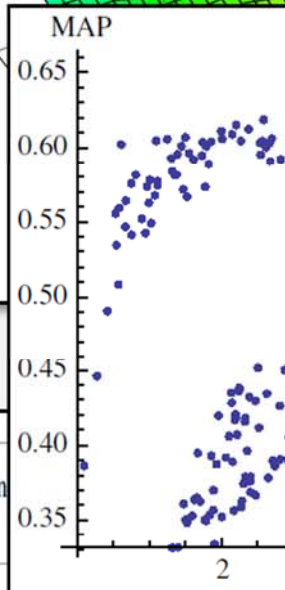
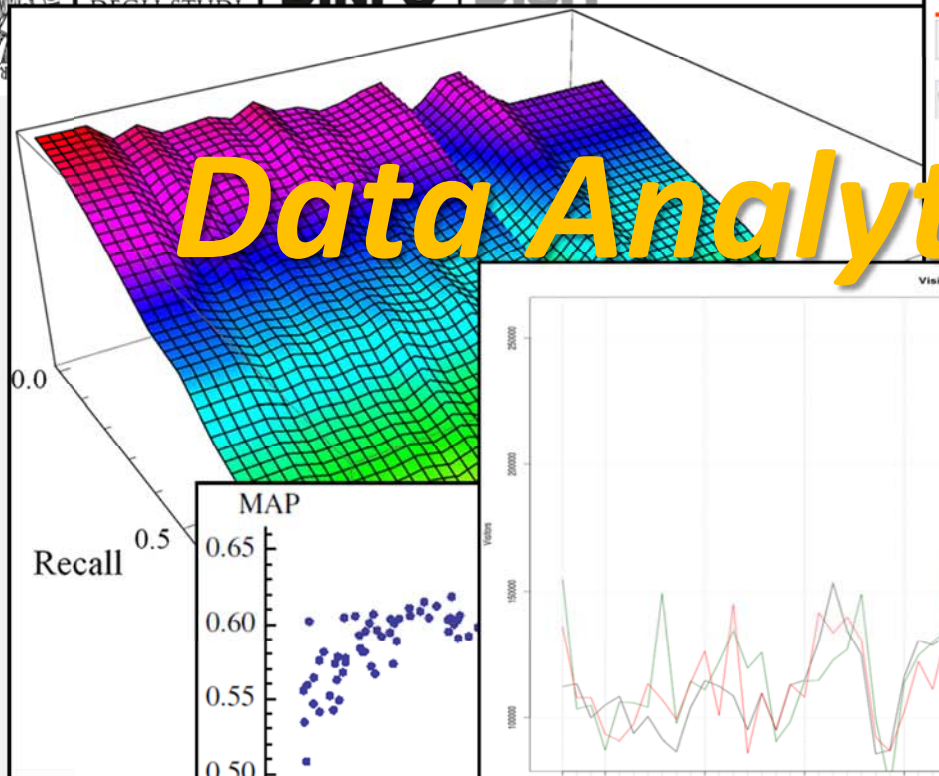
più di 4000 risultati, attivato clustering

Services 16858

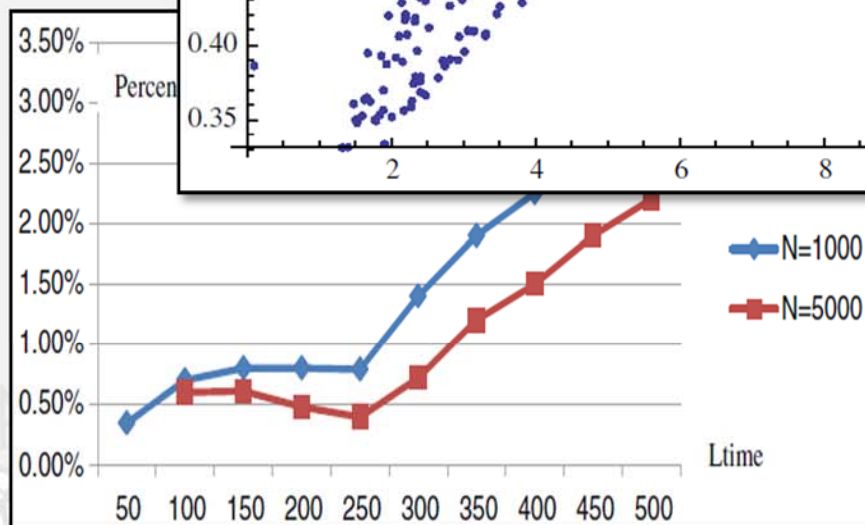
<http://servicemap.km4city.org>



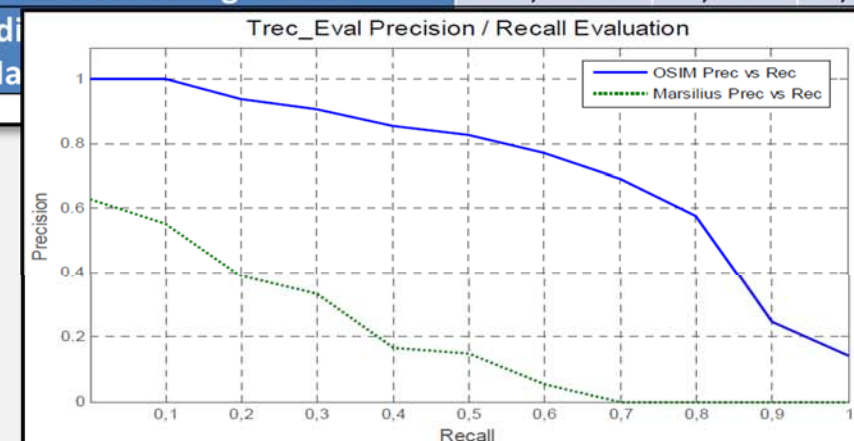
# Data Analytics - Big data



	Precision	Recall	F1
n	1,00	0,69	0,820
+	0,985	0,722	0,833
	0,927	0,508	0,656
	0,968	0,674	0,794
	1,000	0,472	0,642



Link discovering - Leveisthein  
Link discovering - Dice  
Link discovering - Jaccard  
Link discovering on data









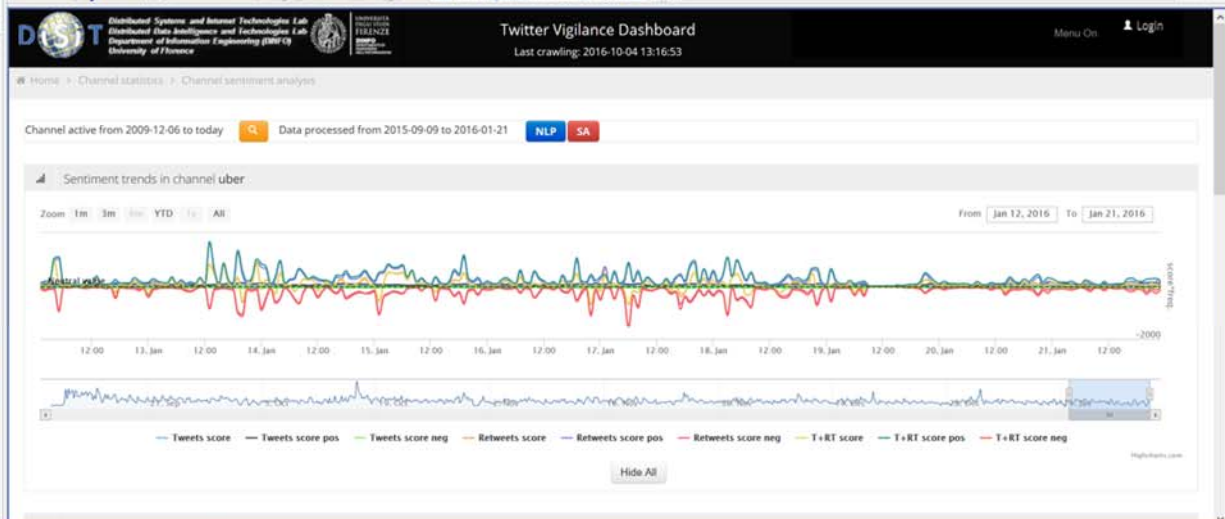
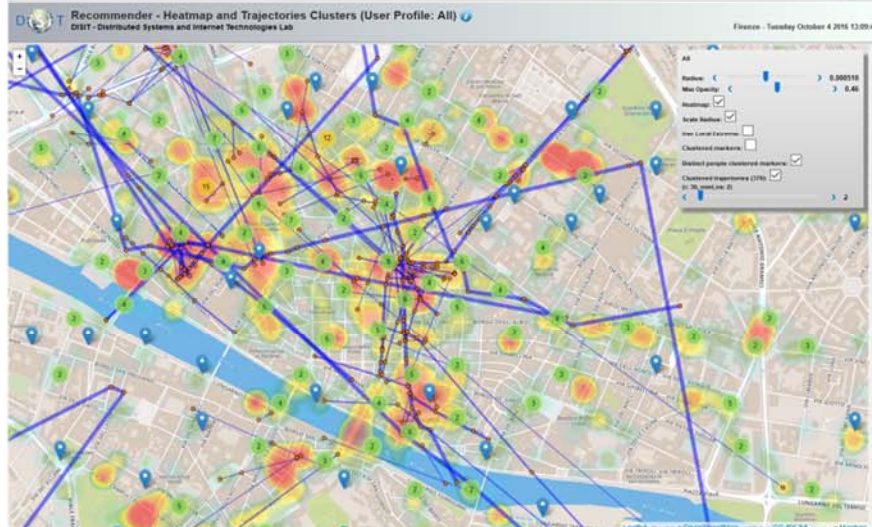
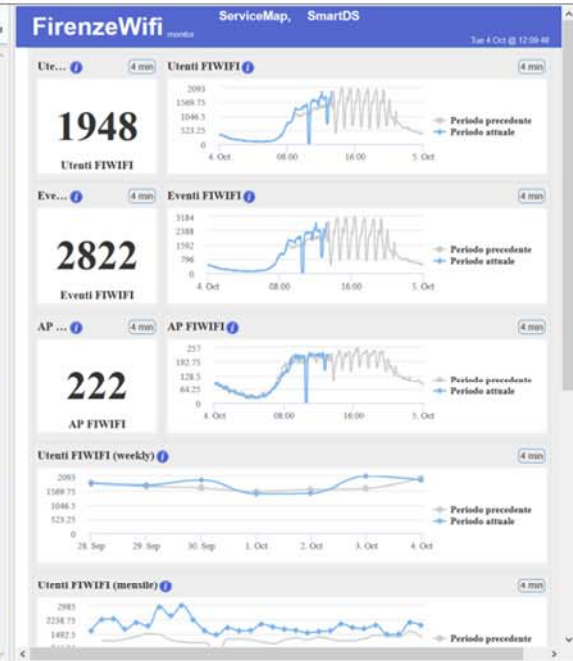
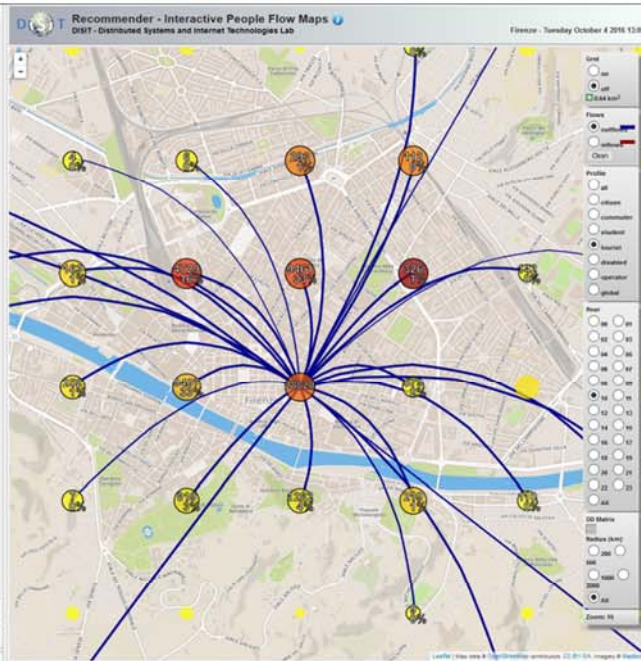
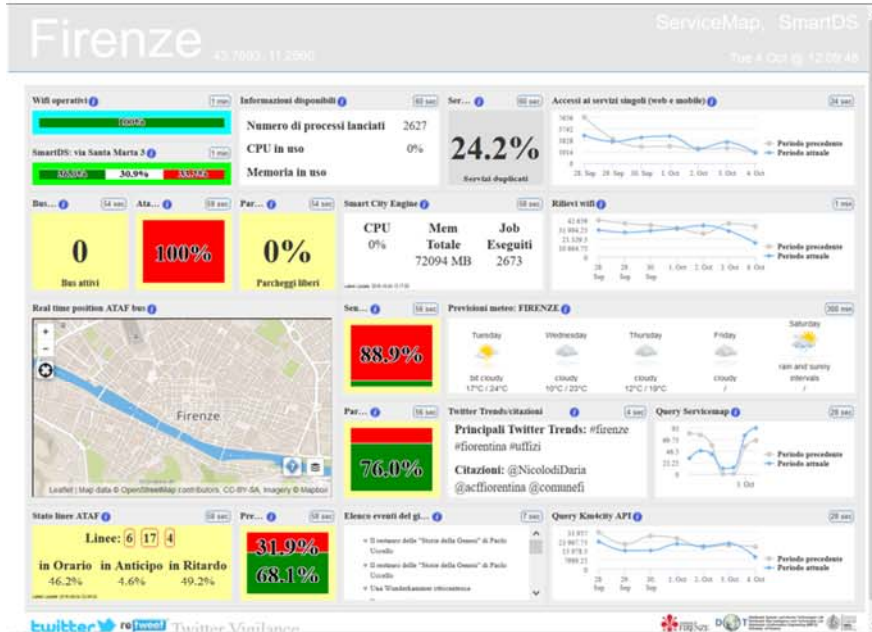


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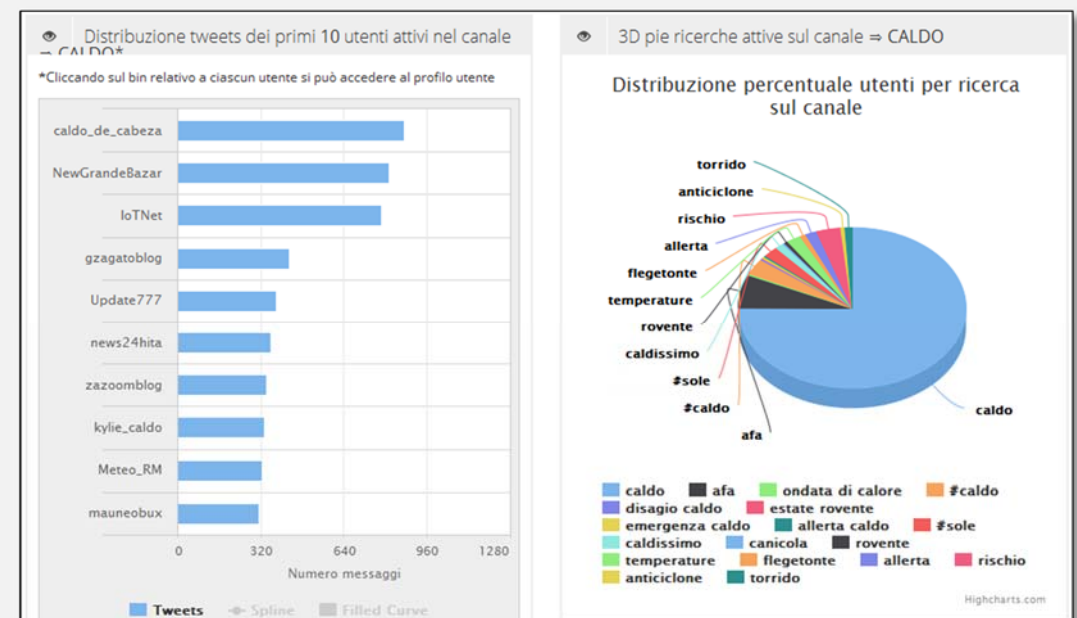
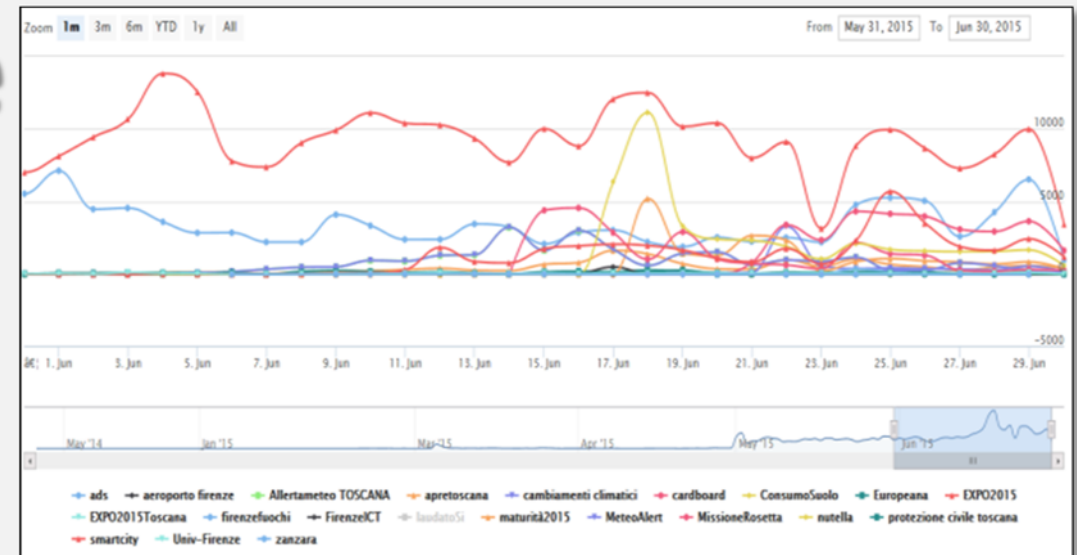
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<http://www.disit.org>

# Smart City Dashboard



# Twitter Vigilance

- <http://www.disit.org/tv>
- Citizens as sensors to assess
  - sentiment on services,
  - Response of consumers,
  - etc.
- Identify, assess and quantify ....
  - Critical conditions,
  - Information channel
  - Opinion leaders
  - communities





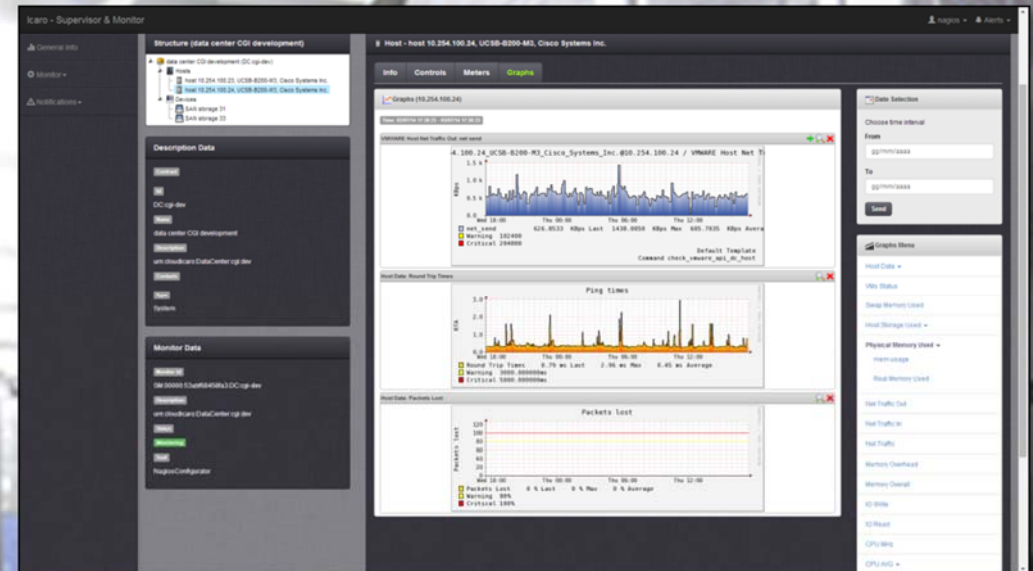
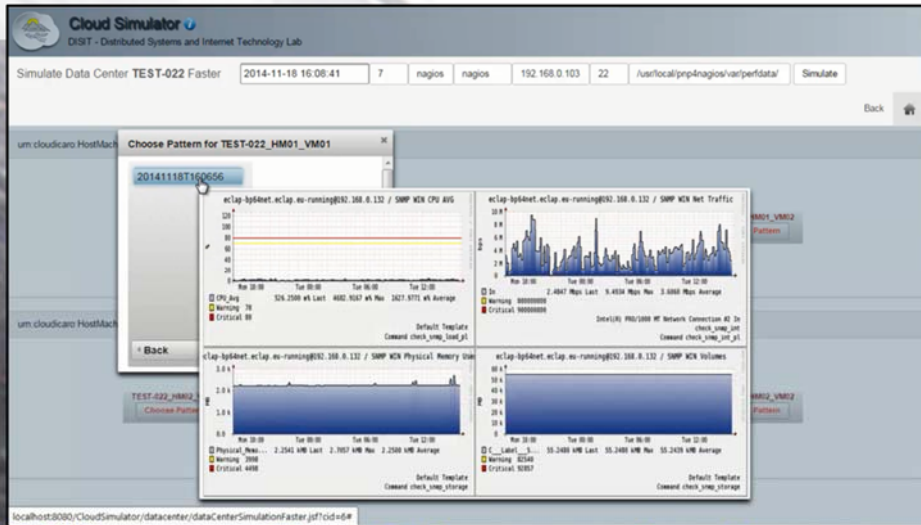
# Smart Cloud



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## Cloud Simulator Cloud Monitoring Cloud Management Progetti Regionali: ICARO



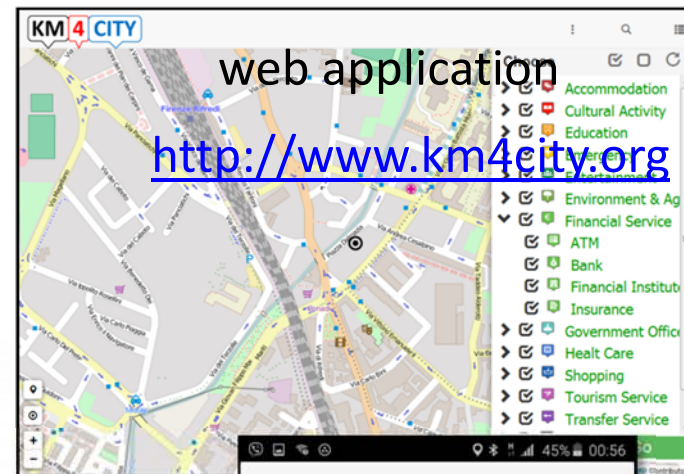
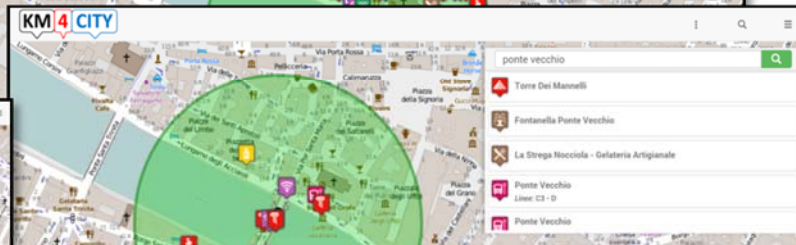
## TT verso PMI e GI

- **Riduzione costi e incremento efficienza**
  - Automazione della manutenzione e della produzione
  - Navigazione indoor – Outdoor integrata
  - Ottimizzazione flussi per utensili, pezzi e materiali
- **Progetti Regionali con PMI e GI**





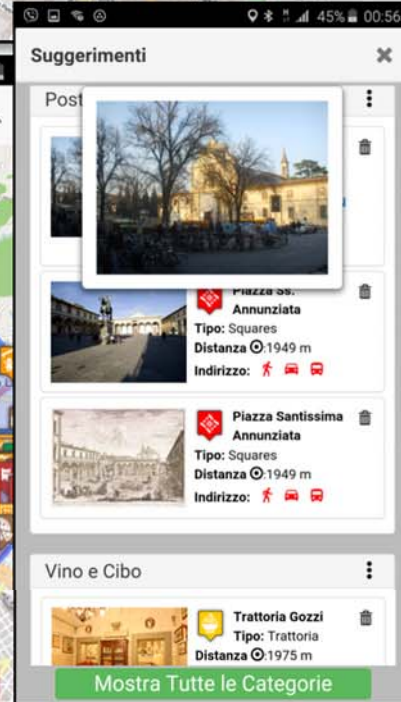
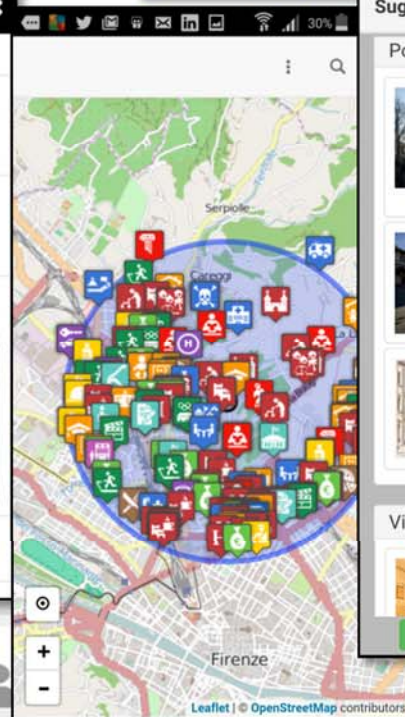
# Km4CityMobile App



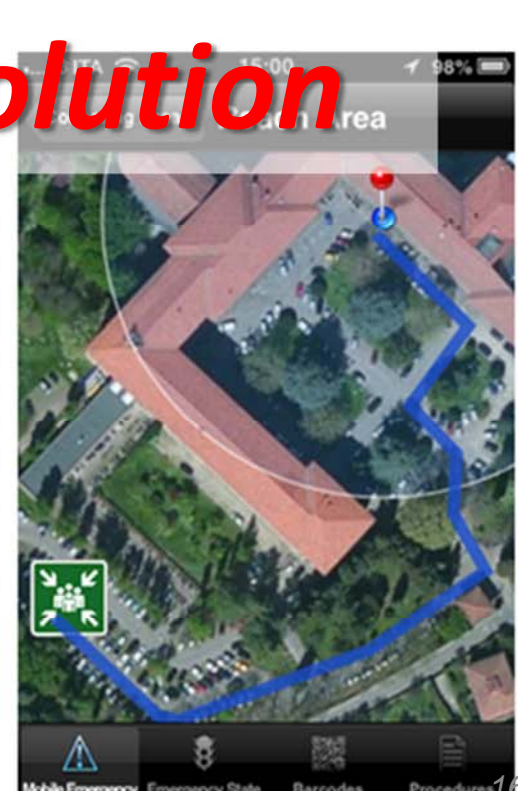
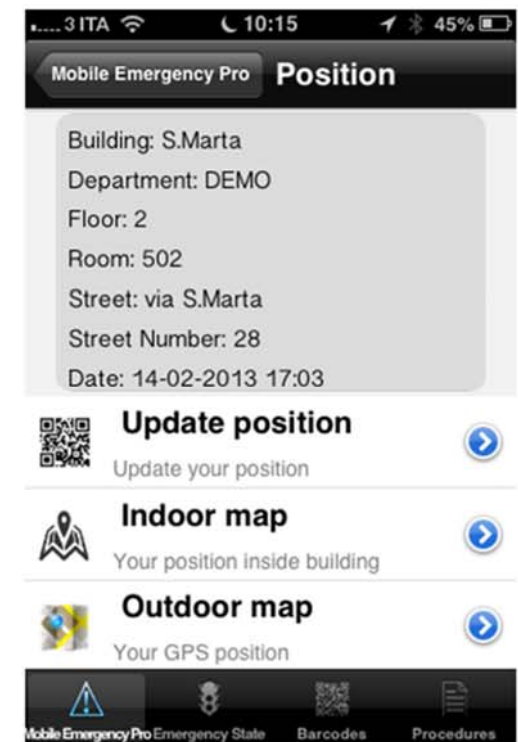
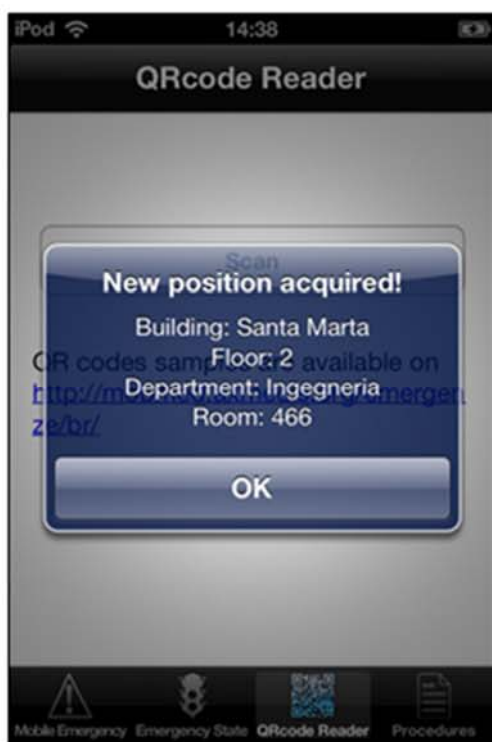
web application  
<http://www.km4city.org>



- Choose Services**
- ☐ Accommodation
  - ☐ Advertising
  - ☐ Agriculture And Livestock
  - ☐ Civil And Edil Engineering
  - ☐ Cultural Activity
  - ☐ Education And Research
  - ☐ Emergency
  - ☐ Entertainment
  - ☐ Environment
  - ☐ Financial Service
  - ☐ Government Office







# Integrated Indoor/outdoor solution



# Overview delle slide

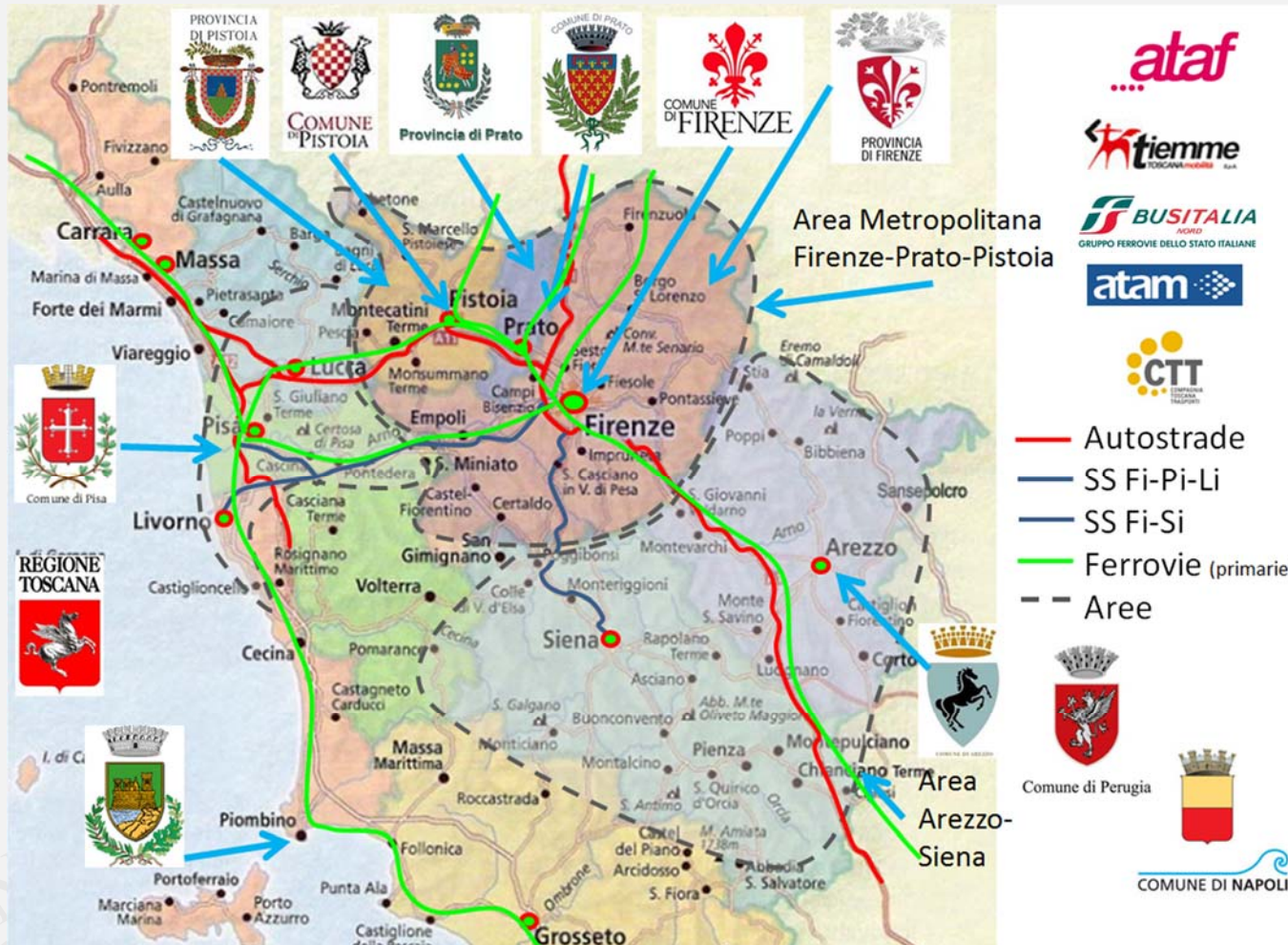
- Argomenti di Ricerca
- **Collaborazioni con imprese e Centri di Ricerca**
  - Relazioni
  - Progetti nazionali
  - Progetti internazionali
  - Progetti regionali (non presentati in questo contesto)
- Tesi ed Elaborati
- CDL Magistrale
- Altri Corsi

# DISIT Lab partners

- Oltre 70 partner in svariati progetti di ricerca ed innovazione
- Aziende come: Thales, SWARCO, TIM, ENEL, Engineering, Rai, BBC, Var Group, Computer Gross, ECM, Tiscali, Eutelsat, IBM, LiberoLogico, Negentis, Time, Elion, etc. etc.
- Comune di Firenze, Citta' metropolitana di Firenze, e oltre altri 200 comuni ...
- ISO, International Standard Organization for MPEG, SmartCity, etc.
- Relations with [builders for Internet of Things, IOT: Intel, Fluctus, UDOO](#)
- registrations for application providers: Apple, MS Windows, Google, Samsung [Samsung for ECLAP Smart TV applications](#)
- [CINI: Consorzio Interuniversitario Nazionale per l'Informatica, DISIT is a](#)
  - [Node of the National Lab on CyberSecurity. http://www.consortio-cini.it/index.php/it/lab-cyber-security](http://www.consortio-cini.it/index.php/it/lab-cyber-security)
  - Node of the Big Data lab <http://www.consortio-cini.it/index.php/it/lab-big-data>
  - Node of Smart City lab <http://www.consortio-cini.it/index.php/it/laboratori-nazionali/smart-cities>
- [CNIT: Consorzio Nazionale Interuniversitario Telecomunicazioni](#)
- [Cluster Tecnologico Nazionale Trasporti nel progetto TesysRail](#)
- [Knowledge Systems Institute](#) of Pittsburgh, USA, as DISIT provider and research collaboration [Knowledge Systems Institute](#) of Pittsburgh, USA, for sentient multimedia, DMS,.. research collaboration
- University of Milan, for the usage of AXMEDIS DRM solutions
- LAMMA e IBIMET per la collaborazione e l'uso della piattaforma Twitter Vigilance in ambito Meteo e Ambiente.
- [NEM: Network and Media Sentient Multimedia Network](#)
- [ONTOTEXT for the OWLIM usage and test Europea](#), ECLAP Aggregator of DISIT, <http://www.eclap.eu>
- [APREToscana](#) with DISIT as technology provider, and coordinator of CRAT with Paolo Nesi
- [IBM, big data and data analytic collaboration ICON Foundation,](#)



- Experimentations and validation in Tuscany <http://www.Sii-Mobility.org>
- Integration with present central station and subsystems
- DISIT lab, Università di Firenze, is the coordinator



**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**



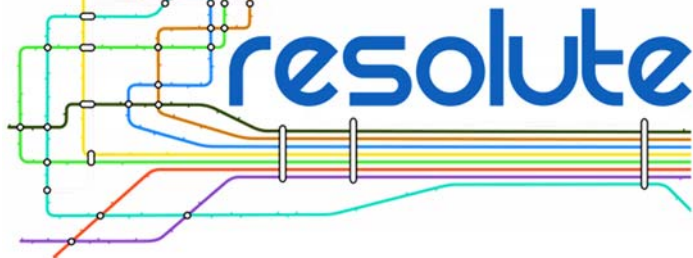
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Horizon 2020  
European Union Funding  
for Research & Innovation



- **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

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

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	HUMANIS T	FR
SWARCO Mizar	SWMIZ	IT
Associação para o Desenvolvimento da Investigação no Instituto Superior de Gestão	ADI-ISG	PT
Consorzio Milano Ricerche	CMR	IT





Horizon 2020  
European Union Funding  
for Research & Innovation


**REnaissance of PLaces  
with Innovative Citizenship  
And Technology**



- **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, 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 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**

# Overview delle slide

- Argomenti di Ricerca
- Collaborazioni con imprese e Centri di Ricerca
- **Tesi ed Elaborati** 
- CDL Magistrale
- Altri Corsi






# Argomenti x Tesi ed Elab.

- Smart City, Internet of things, IOT
  - Linked Open Data, città' resilienti, dash board, modelli decisionali, modelli di valutazione del rischio, Open Data, integrazione dati, lettura sensori, azioni su attuatori, etc.
- Smart Factory, Industry 4.0:
  - rilevazione ed integrazione dati, soluzione per la manutenzione, navigazione indoor/outdoor, dashboard.
- Big Data e Data Analytics:
  - algoritmi di predizione, studio del comportamento umano, traiettorie, Twitter Vigilance, etc.
- Smart Cloud e Cloud Simulation:
  - simulazione cloud, pattern, simulazione SLA.

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# Corso triennale: Sistemi Distribuiti

- XML, WSDL, PHP, programmazione web
- Middleware, remote procedure call, corba
- Sistemi P2P
- Architetture parallele → Hadoop
- Data Warehouse, ETL, Smart City, Open Data
- Cloud Computing



# Magistrale: Knowledge management and Protection System: KMaPS

- Knowledge management, RDF model, SPARQL, Ontologie, reasoner, crawling, NLP
- Sistemi di protezione su contenuti WEB e mobile, licenze
- Social Media
- Raccomandazioni: social, geo, temporal
- Big data store e tool, NoSQL database, Hadoop
- Applicazioni: Smart Factory, Smart City



# Altri Corsi per Afferenza al DISIT Lab

- Dottorato DIST (indirizzo Ing. Informatica)
- Master MABIDA, in Big Data Analytics and Business Intelligence
- Scuola di Specializzazione in Sicurezza Nazionale

