



Detecting and analysing terrorist-related  
online contents and financing activities

# Who is behind terrorist events?

*Deep analysis and a new model of knowledge representation for supporting Intelligence*

Ernesto La Mattina

*Engineering Ingegneria Informatica S.p.A.*

Brussels – 06<sup>th</sup> December 2017

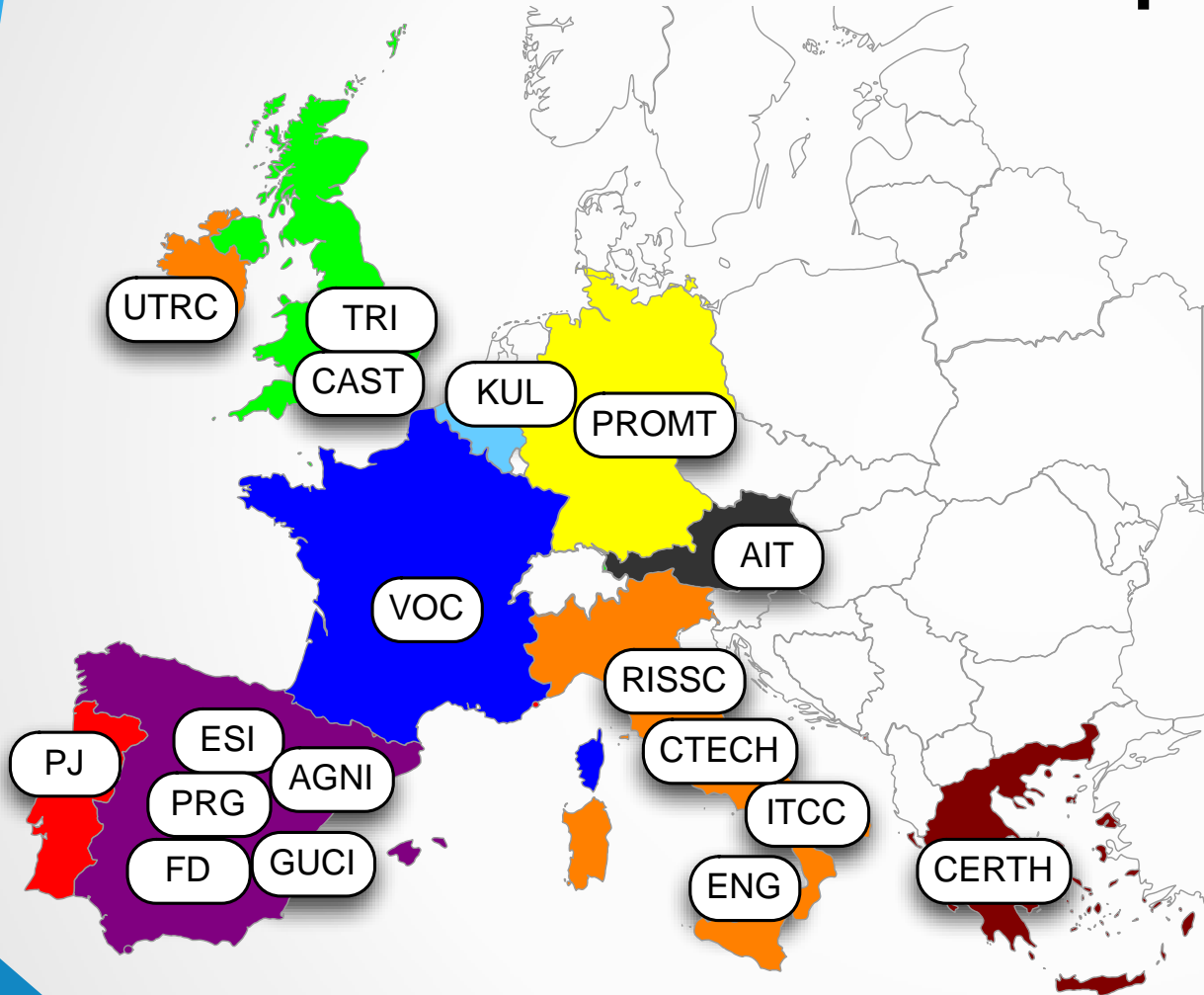
9<sup>TH</sup> COMMUNITY OF USERS ON SAFE, SECURE AND RESILIENT SOCIETIES  
WORKSHOP ON CYBERCRIME



# Outline

- DANTE Project
- DANTE Goal
- Motivation
- Benefits for LEAs
- Connecting the dots
- DANTE workflow
- Connecting digital with real identity

# DANTE project



- ✓ H2020-FCT-06-2015
- ✓ *Law Enforcement capabilities 2: Detection and analysis of terrorist-related content on the Internet*
- ✓ Start: 1<sup>st</sup> September 2016
- ✓ Duration: 30 months

18 partners  
10 countries

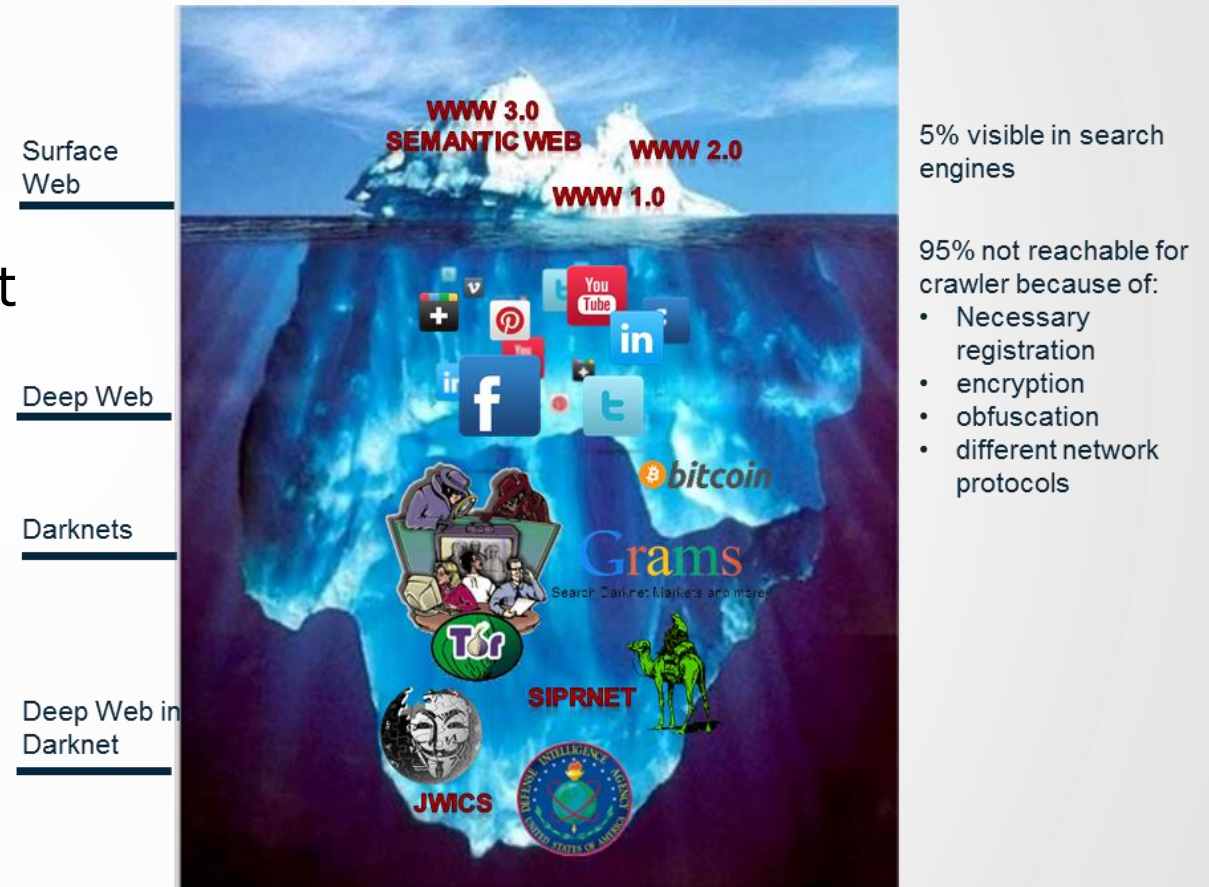
4 LEAs  
7 SMEs

## DANTE Goal

**DANTE** aims to study, design and develop **efficient, automated data mining and analytics solutions**, to search and retrieve, collect and analyse huge amount of **heterogeneous terrorist-related data** from the Surface Web, Deep Web and Dark Nets, in order to detect, analyse, and monitor potential **terrorist-related activities**, with a special focus on **online raising funds** activities.

# Motivation

- Most terrorist groups (including ISIS) use **the Internet to raise funds** to support their activities (e.g. using gambling sites, stolen credit cards, charities to receive donations under the cover of humanitarian initiatives, etc...) and for **propaganda, education, and recruiting purposes**



# Motivation

LEAs need of **automatic and intelligent tools** to detect and analyse *terrorist-related contents* generated by terrorists or individuals linked to terrorists, or linked to terrorist activities

# Approach

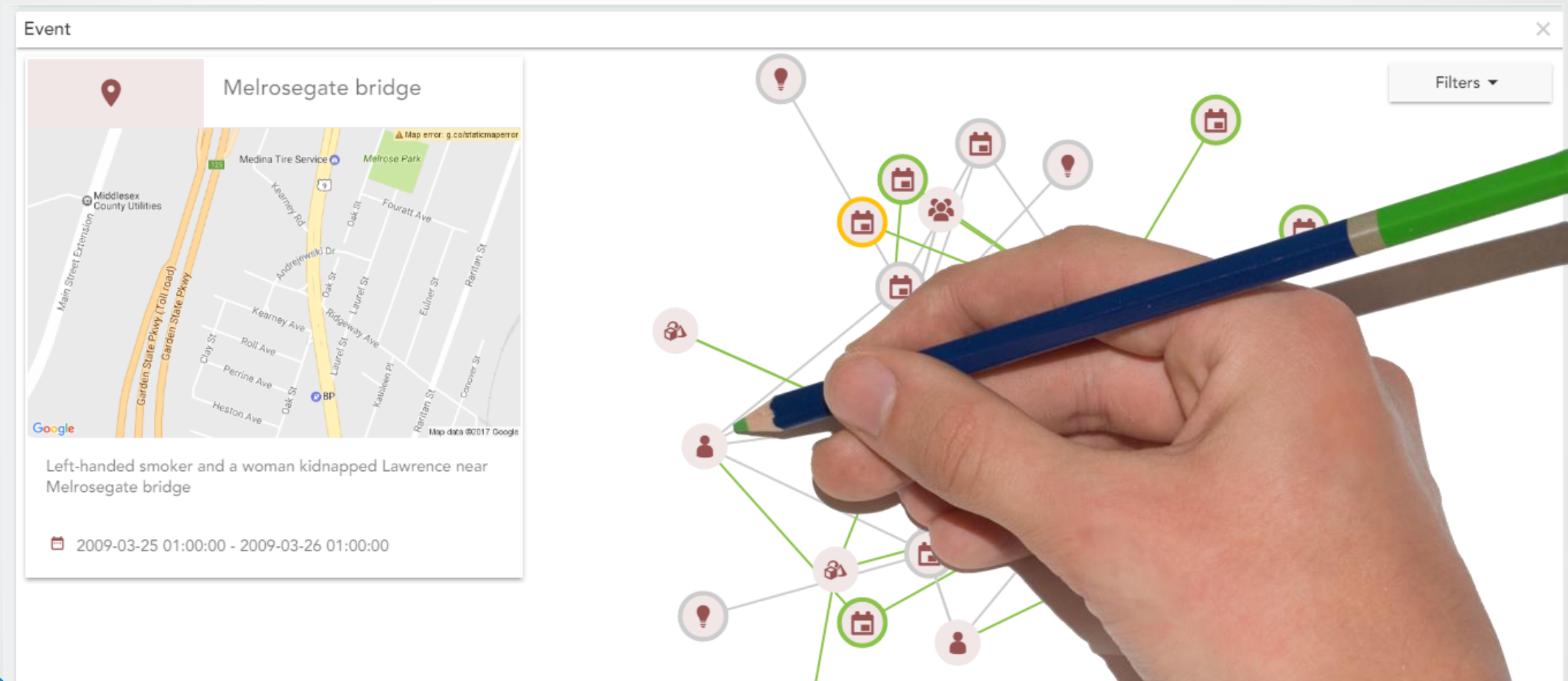
- **Leveraging on past results by exploiting, improving, and integrating several existing data mining and analysis tools**
- Involving LEAs from the very beginning of the project in the definition of the requirements and the pilot scenarios
- Testing and evaluating the services and integrated platform
  - in **relevant environments** (with real data) and
  - in LEAs' **operational environments**
- **LEAs: GUCI, PJ, CAST, ITCC**

## Some expected benefits for LEAs

- To increase the **number of monitored sources**
- **Automatic detection** and analysis of **huge volume** of online contents
- To create and keep updated a **database of terrorism web sources** categorized for *propaganda, disinformation, radicalization, training, and fund raising*
- To use the relevant contents **in legal proceedings** as **valid evidence**
- To automatically handle with **multilingual contents**, especially in Arabic
- **Automated searches** of previously identified, categorized, and selected relevant contents
- Automatic creation of "**graphs**" of profiles



# Connecting the dots...



The screenshot shows a web interface for an event. On the left, a map of the Melrosegate bridge area is displayed, with a red location pin. Below the map, the event title is "Left-handed smoker and a woman kidnapped Lawrence near Melrosegate bridge" and the date is "2009-03-25 01:00:00 - 2009-03-26 01:00:00". On the right, a network diagram consists of various icons (lightbulbs, calendars, people) connected by lines. A hand holding a blue pencil is pointing at the network diagram, and a green highlighter is also visible.

Event

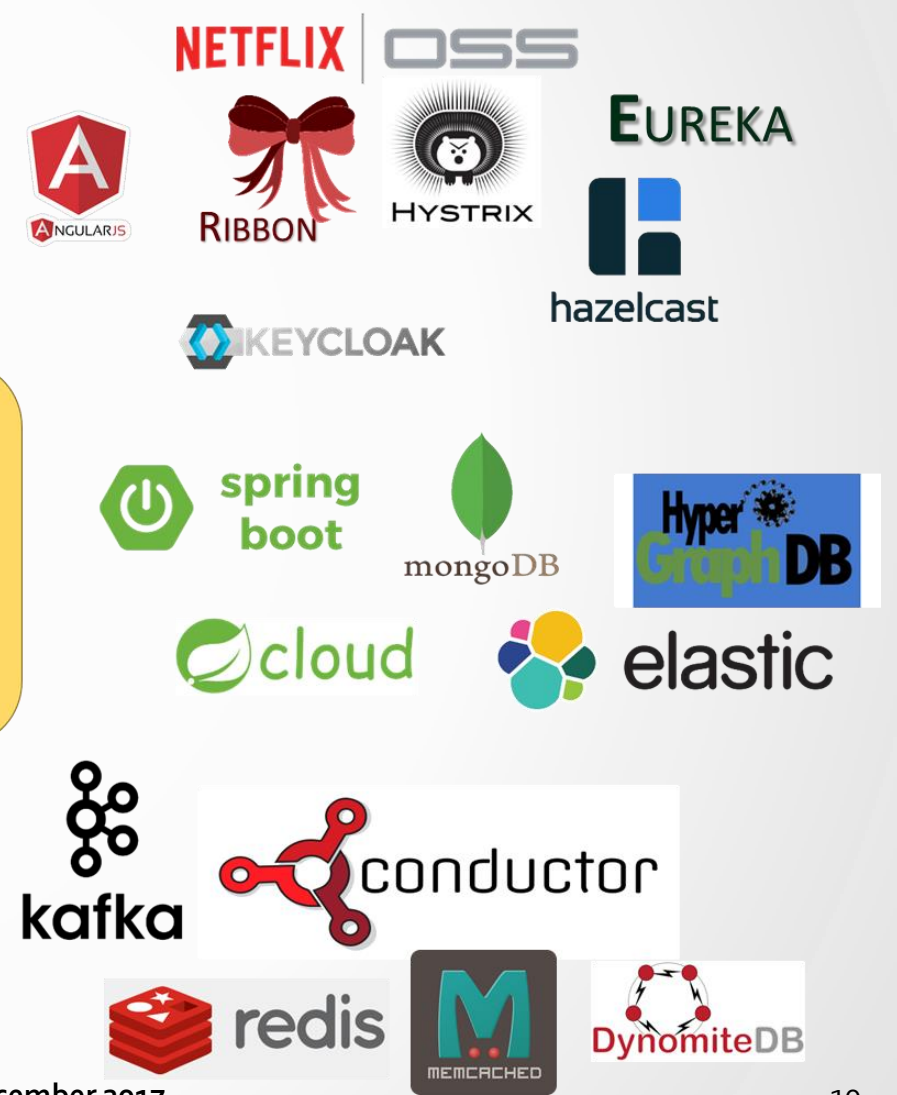
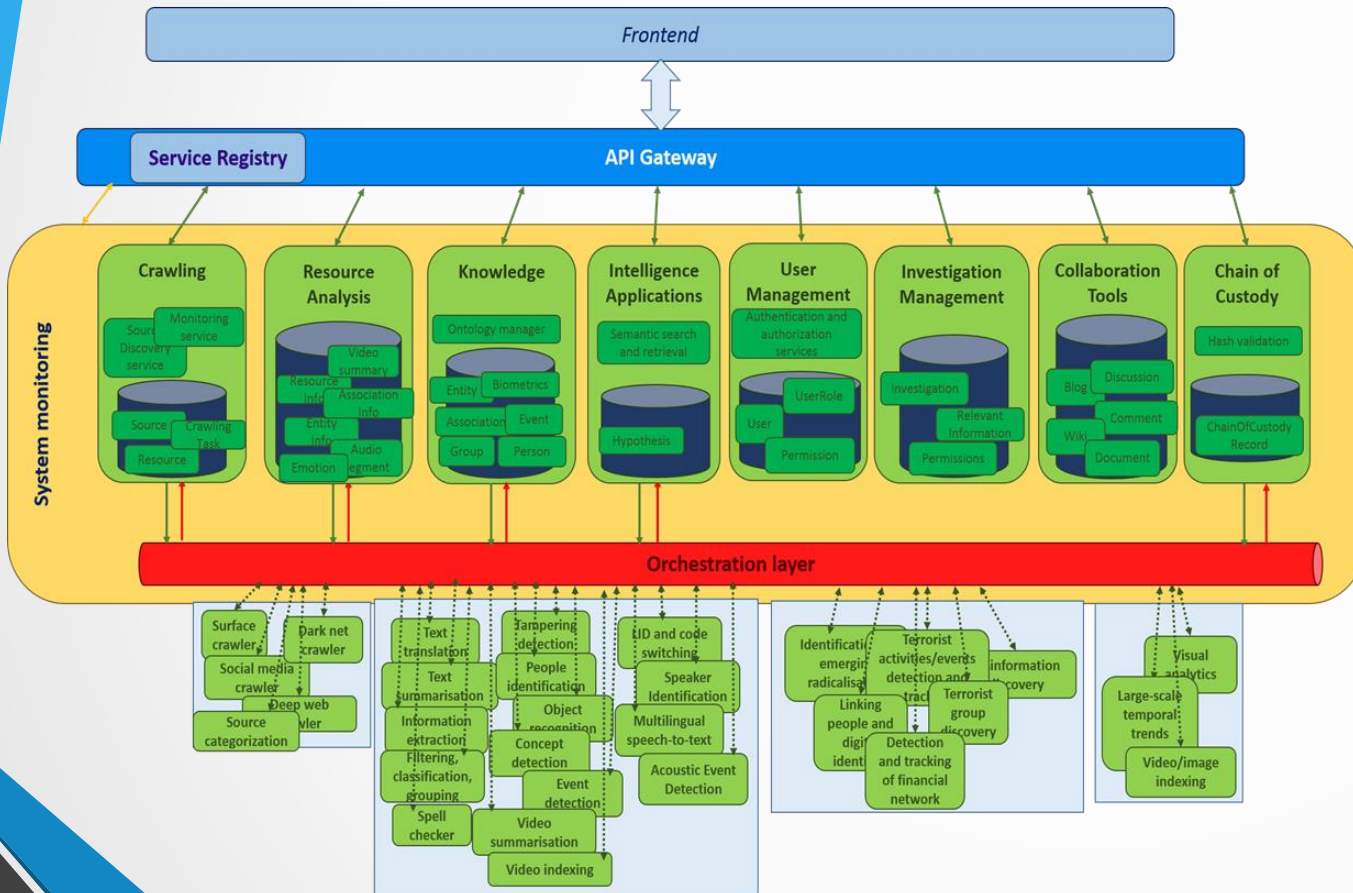
Melrosegate bridge

Left-handed smoker and a woman kidnapped Lawrence near Melrosegate bridge

2009-03-25 01:00:00 - 2009-03-26 01:00:00

Filters

# ... using the most powerful technologies



# DANTE Workflow

## Listening to the Web



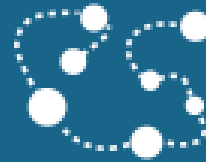
Discovery and monitoring

## Analysis



Information extraction

## Knowledge management



Connecting the dots

## Decision



Visual analytics



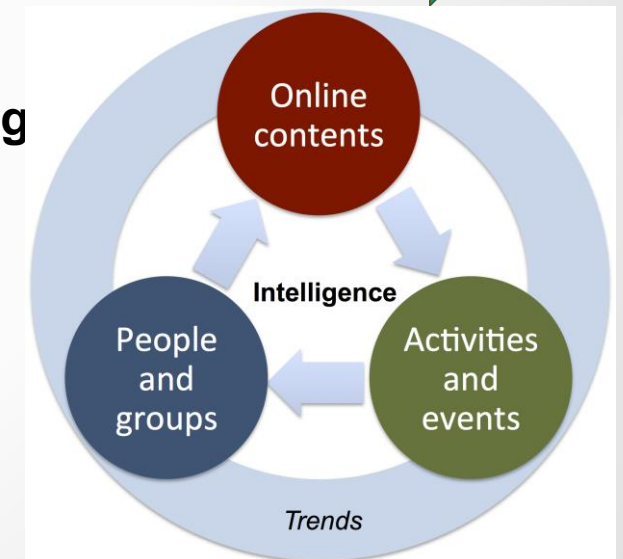
Search Retrieval



Intelligence Applications

- Collaboration
- Human-in-the-loop
- Big data

- Machine learning and automatic reasoning
- Open and extensible

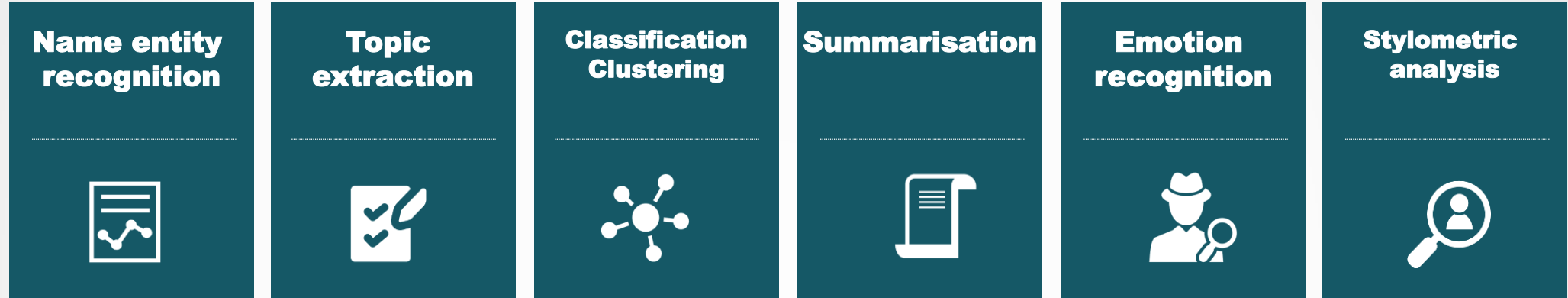


# Listening to the web for discovering and monitoring





# Information extraction – Text analysis



**Italian**

ogatori del figlio sedicenne e dell'amico a portare i  
dove recuperare l'ascia e i vestiti sporchi di sangue  
i. Erano in un corso d'acqua a Caprile, frazione  
angorino, luogo del delitto, dove fino a qualche  
Vincelli abitava e dove vive il presunto complice,  
ni a novembre.

**English**

Creating and Presenting

They are encouraged to read widely and to study at least one set text or a collection of shorter set texts in order to examine the effects of form, purpose, audience and context on the authors' choice of structure and language.

They draw on the knowledge gained from this study to create their own written and/or multimodal texts in a process which includes planning, reviewing and editing.

**Spanish**

Peiro de nosotros que tróbase allá arripia, xiramen chantado tróbase el nombrífel de toi, que el Garo Forxe de Toi se trobe a nosotros, que totís las cosífelas que tú querúnes se fainen aquíbis en la ríeta y alíquis arripia. El artón de hoiveo ficanoslo hoiveo, y alturianos de culpífelas como nosotros alturiamos a otris de las de allegos, non querúnes que trompísemos en bisornia, mais cláudianos de xili fate. Icho fique.

**Netherland**

door de eeuwen geboetseerd is. Erg goede ontvangst. Ana spreekt gebro- ken Engels. Twee studio's op de eerste verdieping en een appartement op de benedenverdieping. Kraakhelder en leuk ingericht, met keukenhoek en douche. Uitzicht op de straatjes van de wijk.

**Portuguese**

Partidos e movimentos reforçaram hoje os principais argumentos pelo "sim" e pelo "não" no último dia da campanha do referendo sobre a despenalização da Interrupção Vo- luntária da Gravidez, depois de conhecidas sondagens que dão a vitória ao "sim".

"Estamos no final da campanha e chegou portanto o momento de tomar decisões. Mas gostaria de deixar um ponto absolutamente claro: não estou nesta campanha para derrotar ninguém, estou nesta cam-

**Arabic**

العاصمة الليبية لتأمينها تنفيذًا لقرار المؤتمر الوطني العام. يأتي ذلك بعدما أعلن اللواء الليبي المتقاعد خليفة حفتر أنه طلب من المجلس الأعلى للقض الدولة حتى الانتخابات النيابية القادمة.

# Information extraction – Multimedia analysis

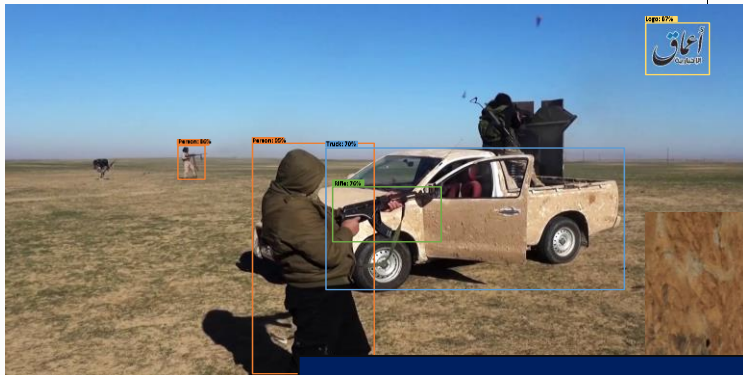


**Audio Analysis**

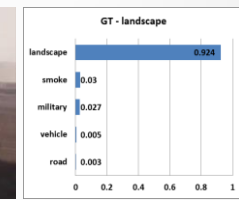
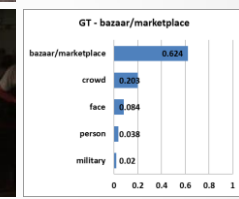
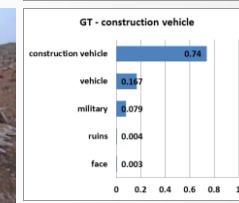
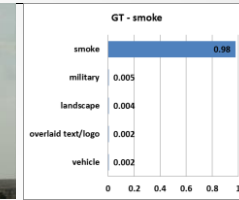
**Concept detection**



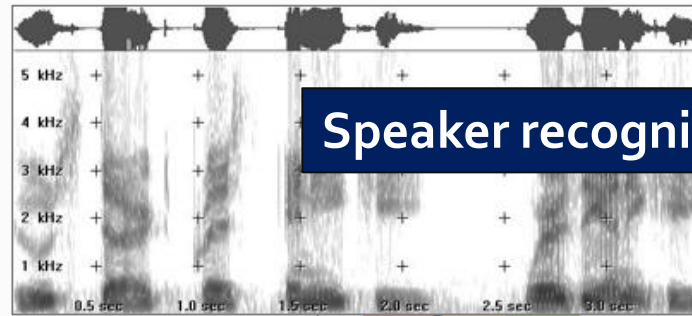
**People detection and identification**



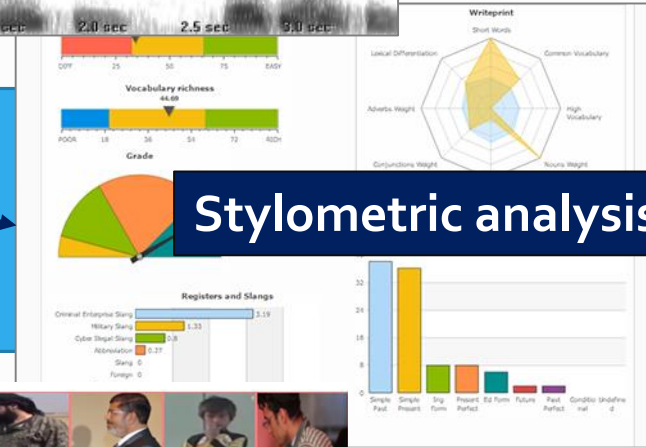
**Object recognition**



# Connecting digital with real identity



Speaker recognition



Stylometric analysis



Person recognition





# Multi-dimensional network

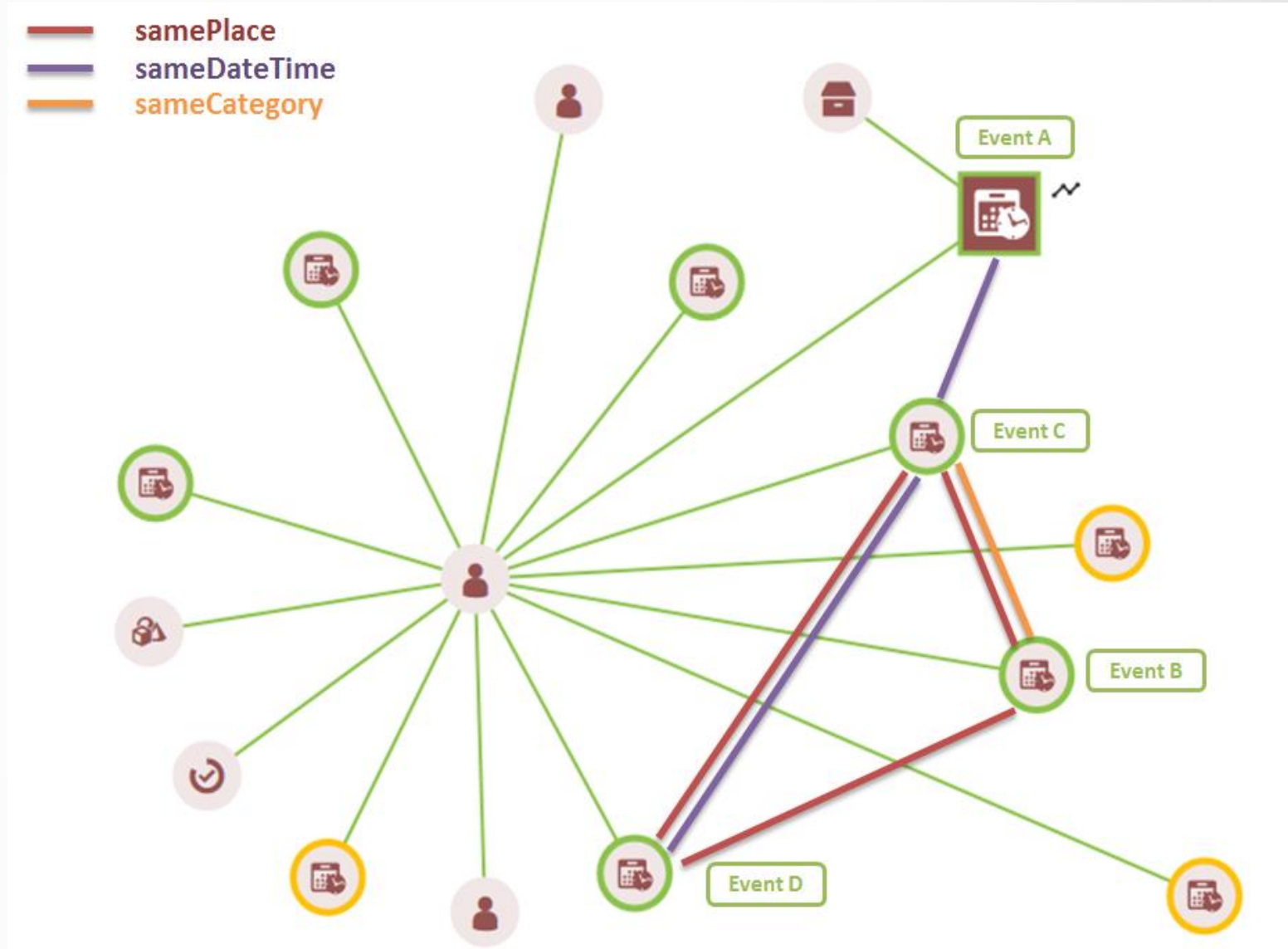
To enable focusing on

- Events
- People and groups
- Resources
- Upper ontologies for information exchange





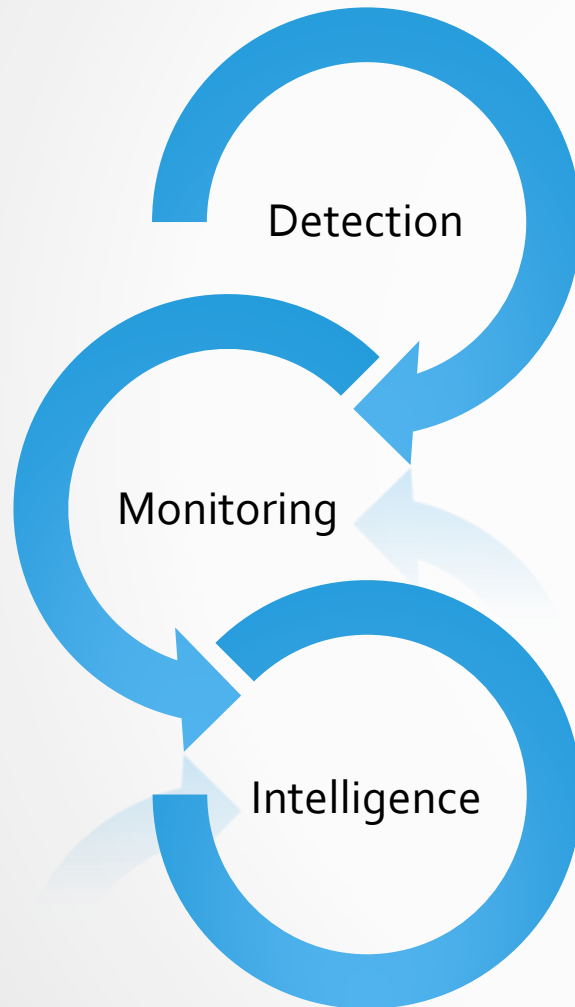
# Big Graph exploration



# DANTE Ontology – Terrorist Act

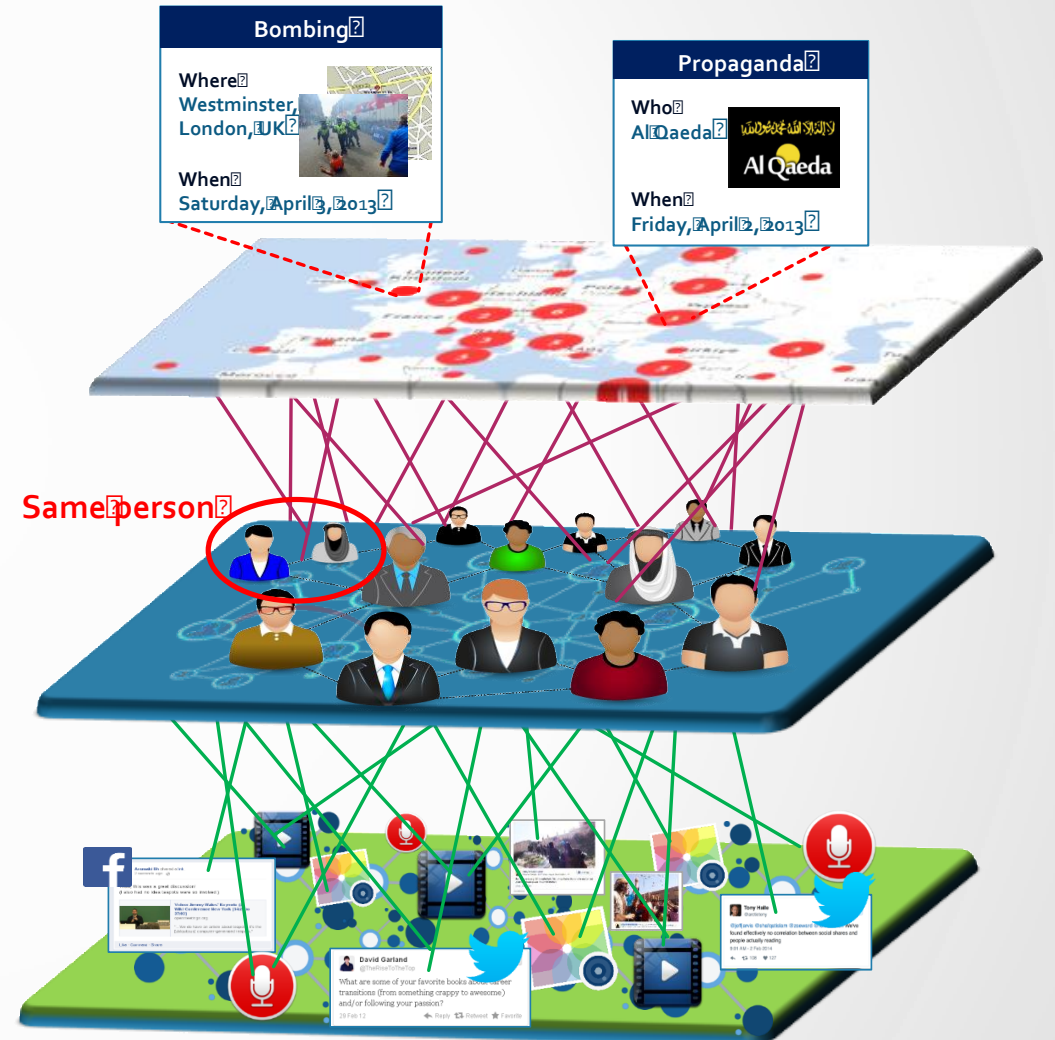
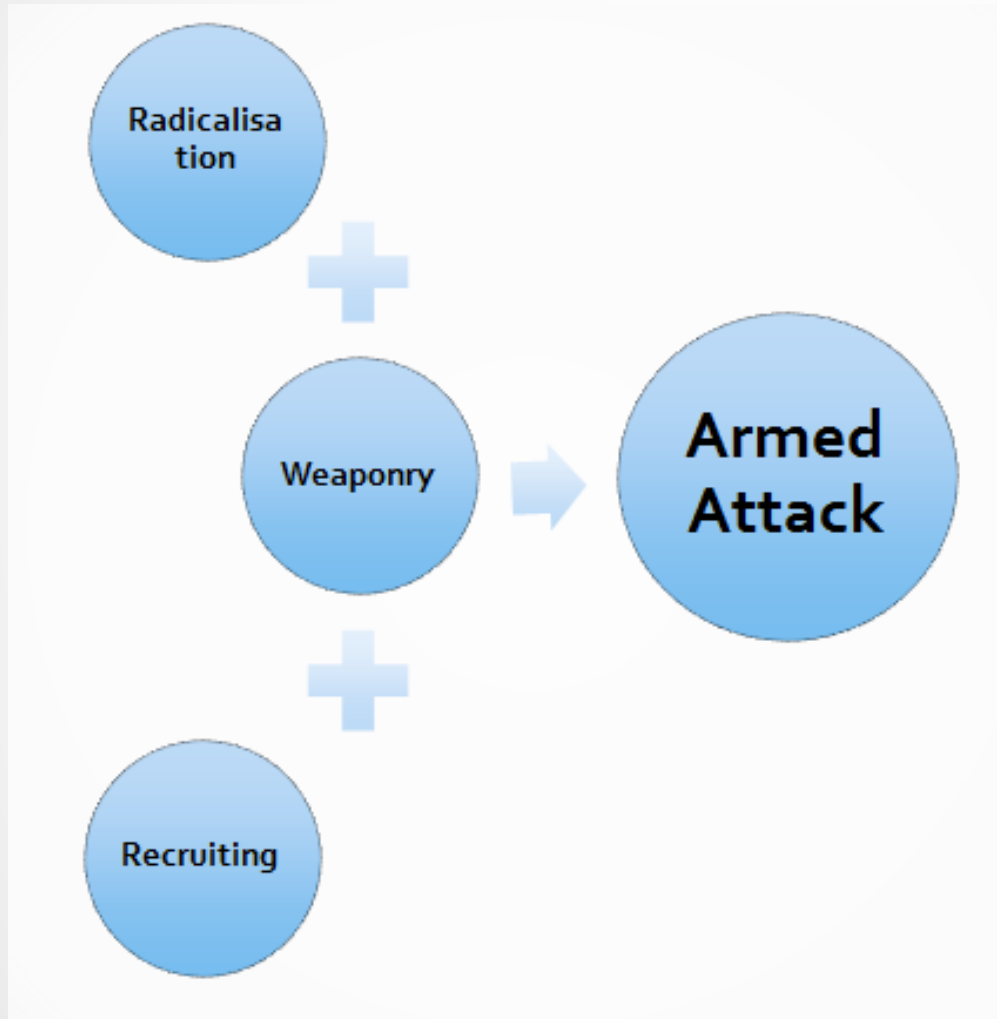
- A common semantics for describing terrorist acts
- **Terrorist Act** ontology has been realised, inspired to **Universal Message Format (UMF)** standard
- 3 Macro Areas
  - Investigation
  - Resource
  - Entity
- Main entities
  - **Person**
  - **Organisations**
  - **Locations**
  - **Item**
  - **Connection**
  - **Event**

# Terrorist activities/events detection and tracking



- Detection of sources or dangerous activities representing a threat for Public Safety
- Monitoring their evolution
- Connecting all possible activities in order to understand dynamics and prevent an attack preparation.

# Event detection, reason, and information fusion



## Ernesto La Mattina

*Head of Homeland Security Research Area  
Lab of Intelligent Systems and Social Software  
for Security, Enterprises, Transport and Infrastructures  
Research & Development Lab  
Research & Innovation Division*  
[ernesto.lamattina@eng.it](mailto:ernesto.lamattina@eng.it)

## Engineering Ingegneria Informatica spa

Viale Regione Siciliana, 7275 - 90146 Palermo  
Tel. +39-091.7511856  
Mobile +39-3282688962  
Fax +39-091.7511720  
Skype: ernesto.lamattina  
[www.eng.it](http://www.eng.it)

 [www.eng.it](http://www.eng.it)

 [@EngineeringSpa](https://twitter.com/EngineeringSpa)

 [Engineering Ingegneria  
Informatica Spa](https://www.linkedin.com/company/engineering-gegneria-informatica)

 [gruppo.engineering](https://www.facebook.com/gruppo.engineering)

# THANKS