



Intelligent information system supporting observation, searching and detection for security of citizens in urban environment

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Participant organisation name	Short Name	Country
AGH University of Science and Technology	AGH	Poland
Fachhochschule Wien	FHTWIEN	Austria
Gdansk University of Technology	GUT	Poland
InnoTec DATA GmbH & Co. KG	INNOTEK	Germany
IP Grenoble (Ensimag)	IPNG	France
General Headquarters of Polish Police	GHP	Poland
Moviquity	MOVIQUITY	Spain
Products and Systems of Information Technology	PSI	Germany
Police Service of Northern Ireland	PSNI	United Kingdom
Poznan University of Technology	PUT	Poland
Universidad Carlos III de Madrid	UC3M	Spain
Technical University of Sofia	TUSOFIA	Bulgaria
University of Wuppertal	UNIWUP	Germany
University of York	UNİYORK	United Kingdom
Technical University of Ostrava	VSB	Czech Republic
Technical University of Kosice	TUKE	Slovakia
X-Art Pro Division G.m.b.H.	X-ART	Austria

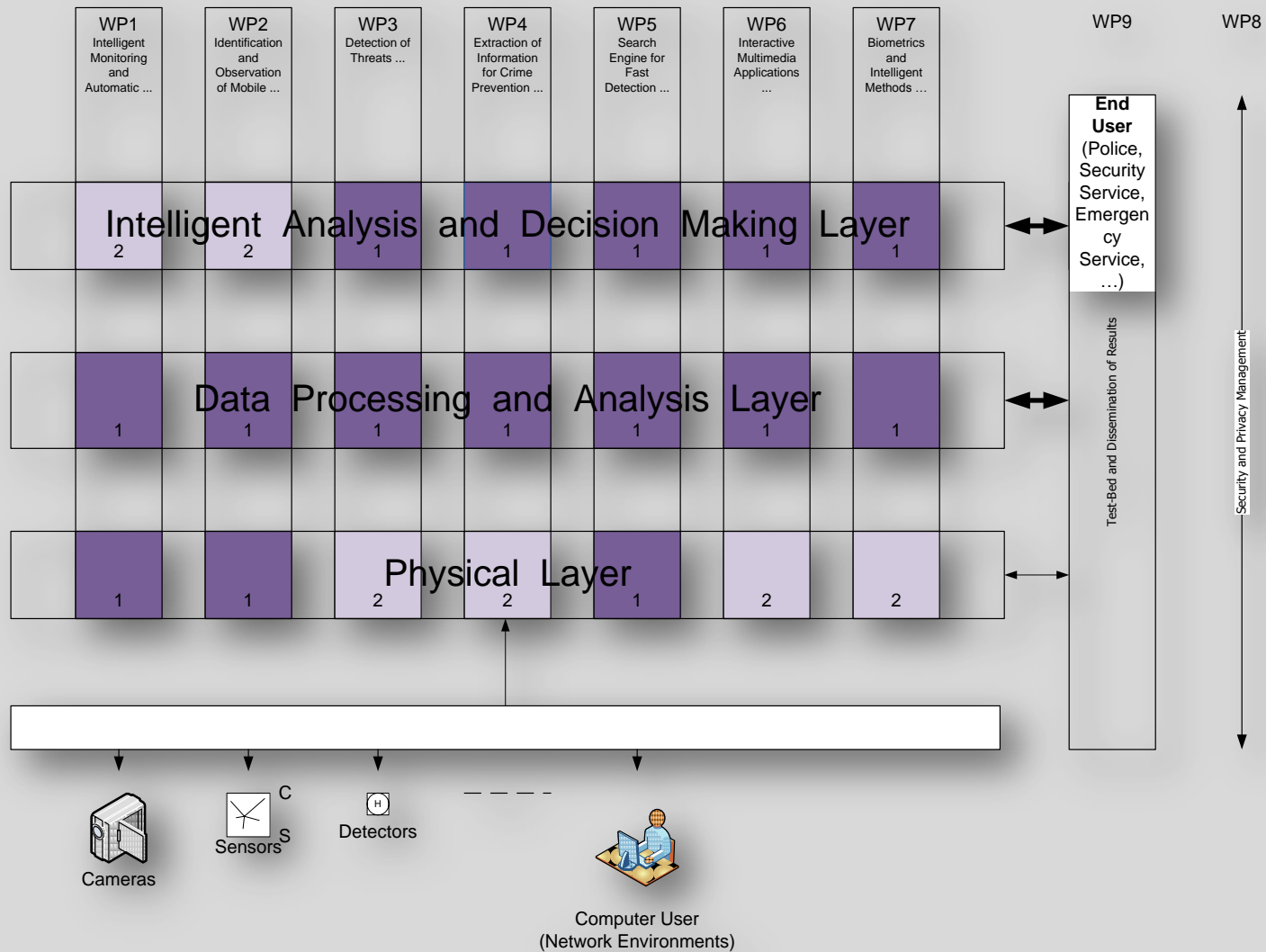


Platform for **intelligent processing of information** for detection of threats and recognition of **criminal behaviour**

New type of **search engine** for multimedia contents, **based on watermarking technology**

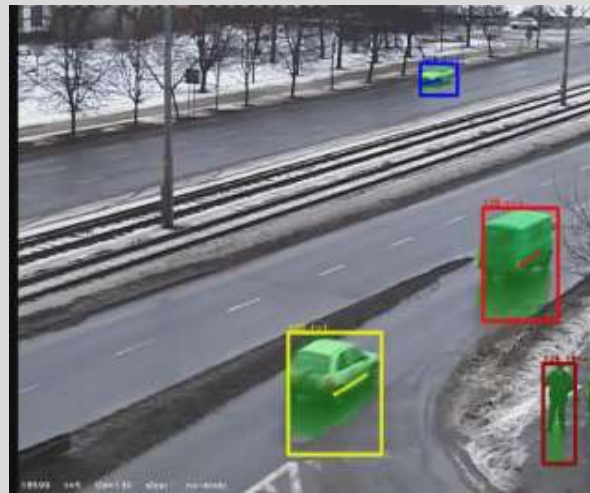
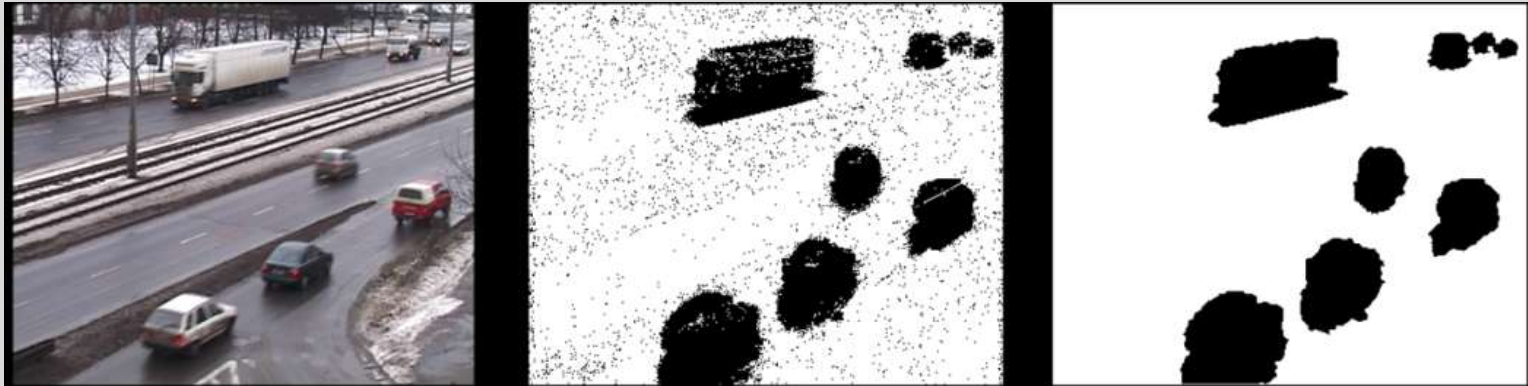
Prototype for intelligent system providing techniques and tools for **detection** and observation of **mobile objects**

New tools for Internet **data analysis** (to detect criminal activities and threats in **computer communication network**)





- Initial versions of video processing algorithms:
 - Background modeling for object detection
 - Object tracking, with collision resolving
- Good performance in variable light conditions (not perfect!)
- Simple event detection:
 - Motion detection
 - Abandoned object (luggage)
 - Crossing the border, entering protected area



Tracking algorithm stages:

- a) original image, b) foreground separation, c) error correction utilizing morphological operations results, d) marked and tracked objects



Abandoned luggage detection

The owner is marked and his image is stored in the database



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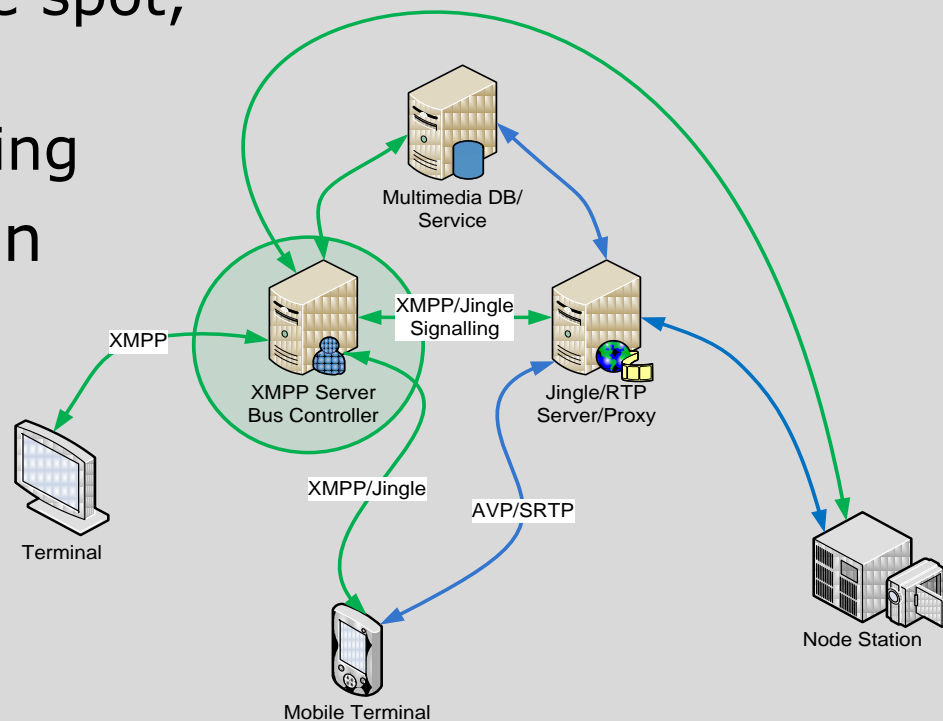


Event detection





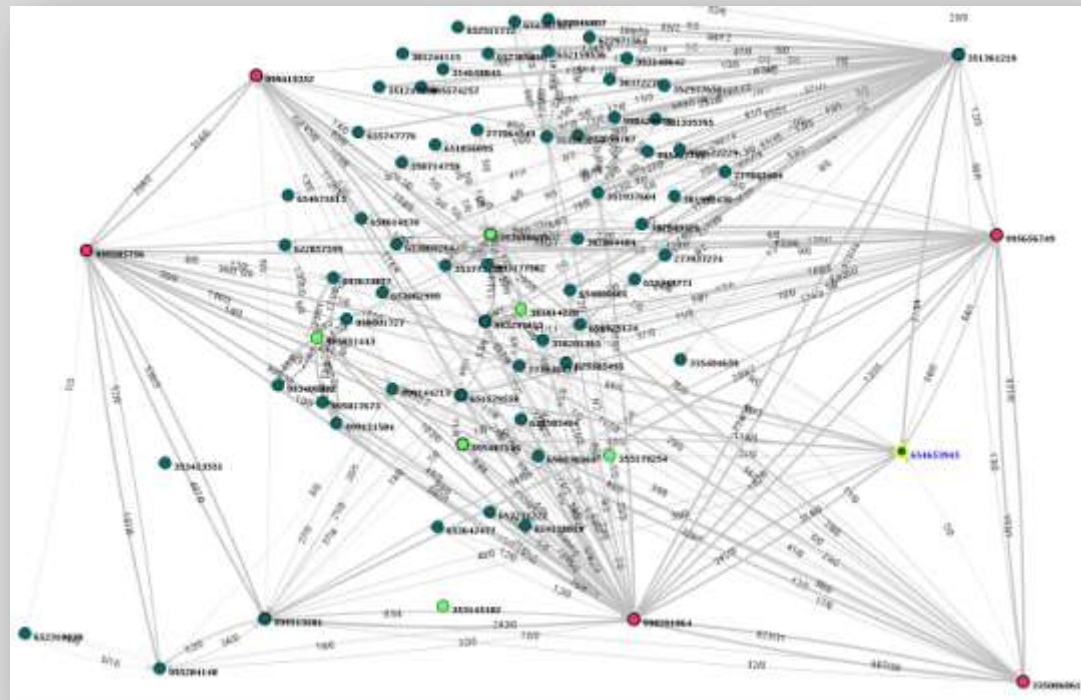
- Node Station specification proposal
 - processing all data on the spot, sending only results
 - encoding and watermarking
- Safe transmission between Node Station, Central and Mobile Terminals



Example module concept - Input and output



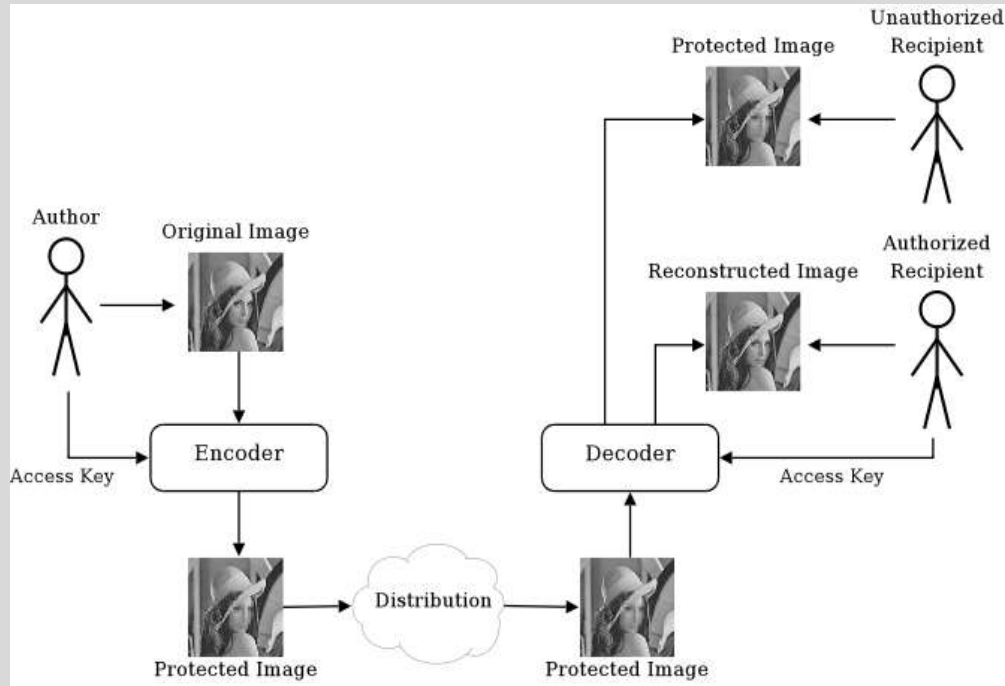
- **Input:** phone billings (mass data), information possessed by a police analyst
- **Output:** a sketch of organization structure including suggested roles of criminals



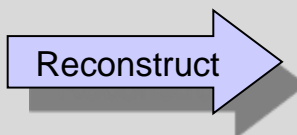


High Level Goals

- Learning of relationships between individuals and organisations
- Search for highly specific information in the Web
- Behavioural profiling of individuals
- Sentiment Analysis
- Detecting Suspicious Websites
- Integrating human supplied information
- Web based collection of crime information



- The censored image can be viewed in ordinary image viewers
- For the reconstruction to succeed a dedicated **decoder** and a secret **access key** are needed



- Censorship method can be customized (e.g., pixelisation, blurring)
- High quality and high performance reconstruction
- Suitable for real-time applications

Input Image

- 1.png
- 10.png
- 11.png
- 14.png
- 15.png
- 24.png
- 3.png
- 4.png
- 6.png
- 7.png
- 8.png
- 9.png
- 99.png
- surv-corridor.png
- surv-hit.png
- surv-room.png
- surv-street.png

Clear Region

Grab Region

Erode Reg.

Dilate Reg.

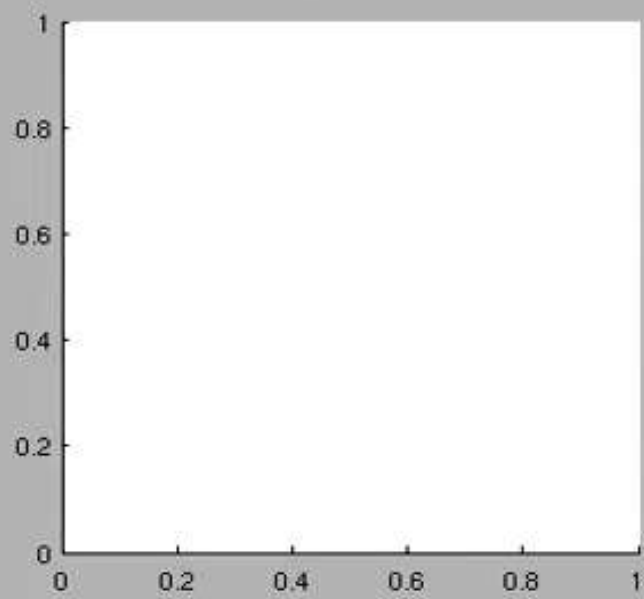
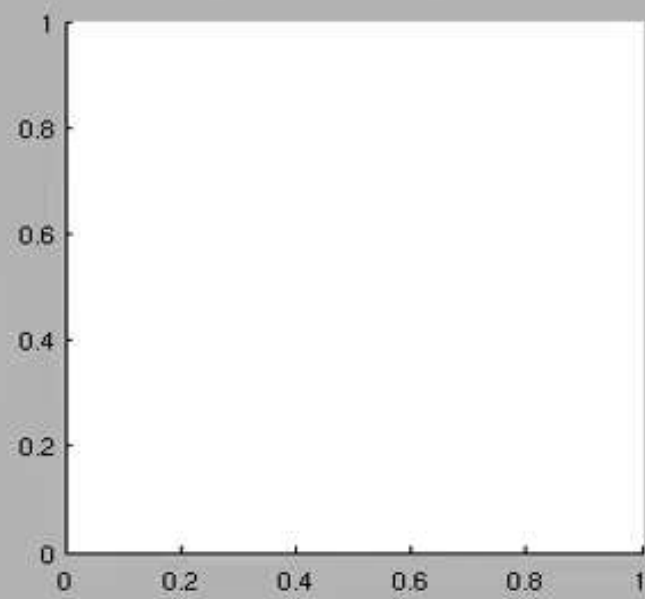
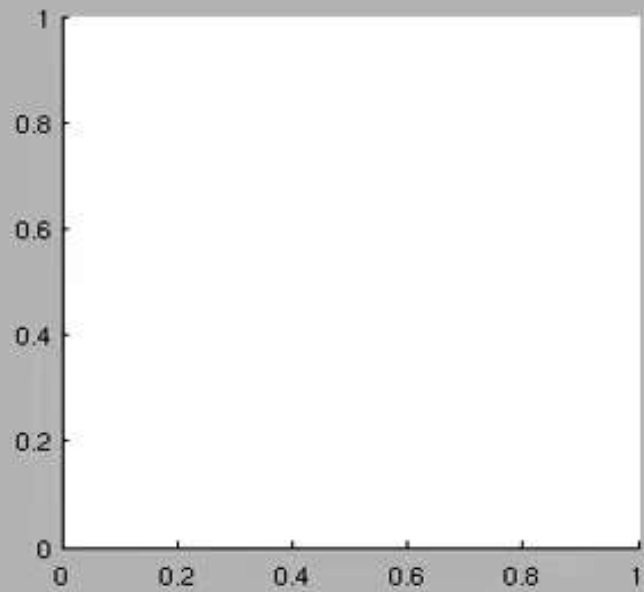
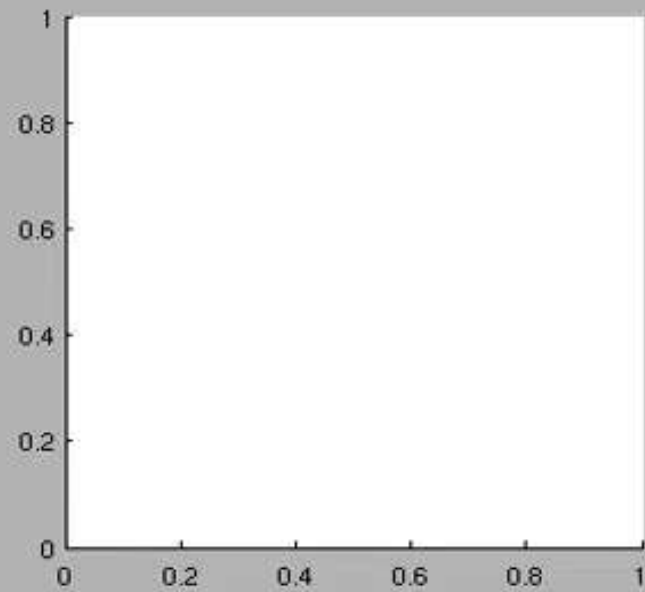
Protection

Qtz: Strength

Quality

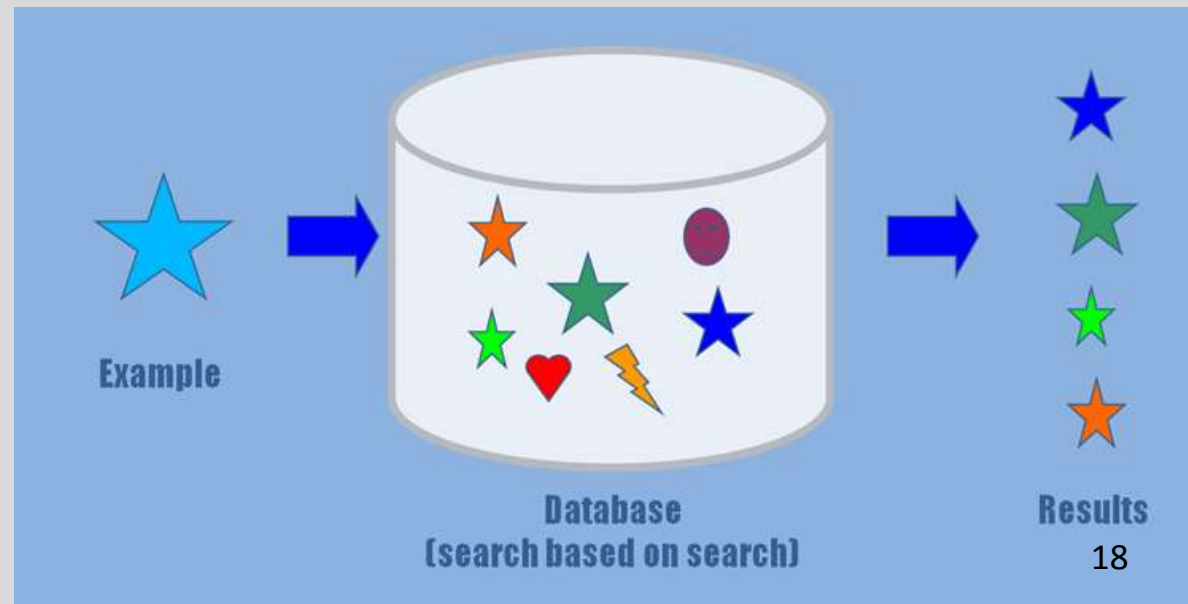
Protect

Qual. Assess.





- A set of software tools used for search for similar images in large databases of images
 - Allows for Query by Example search
 - Fast
 - Scalable



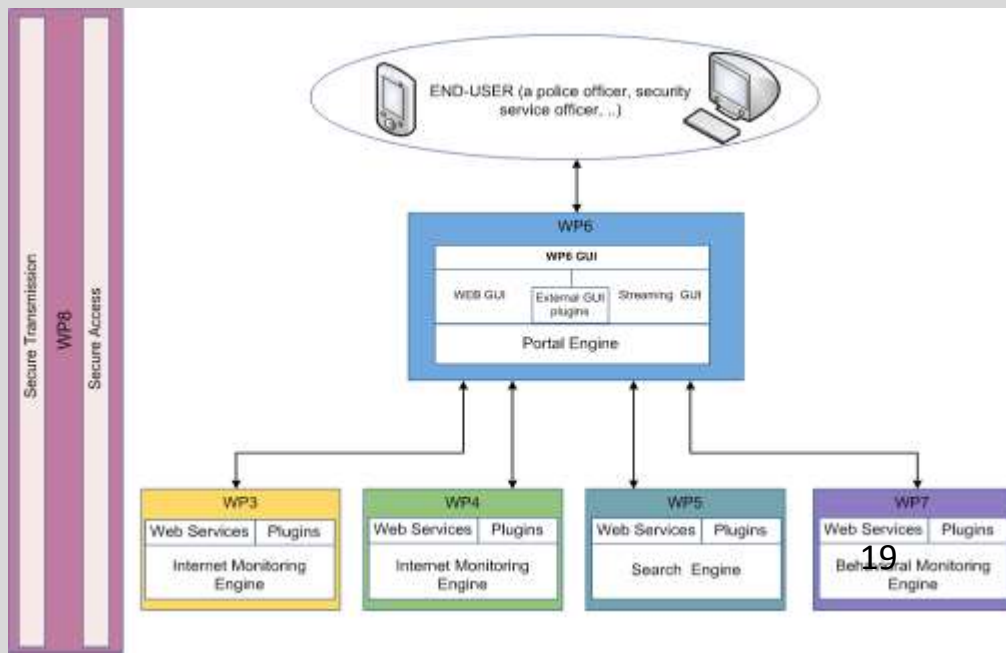


‘Central point’ aggregating information from different INDECT WPs

- Semantically integrating services provided by different INDECT subsystems
- Providing the end users with appropriate content (content recommendation features), supporting workflow and document management
 - INDECT subsystems dealing with security-related aspects of various human activities

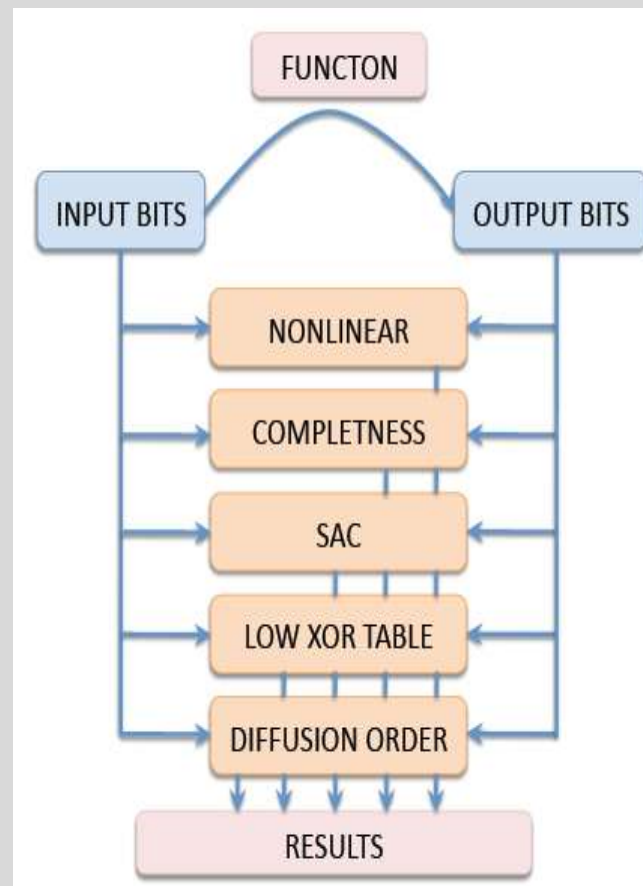
- ◉ Diversity of the data accessed by INDECT end-users (mainly police officers) in their work: both ‘everyday’ duties and performed in case of a crisis (involving the need for communication with citizens)

- ◉ Storage and exchange of different types of data with consideration of privacy requirements (data integrity, secure access and transmission)





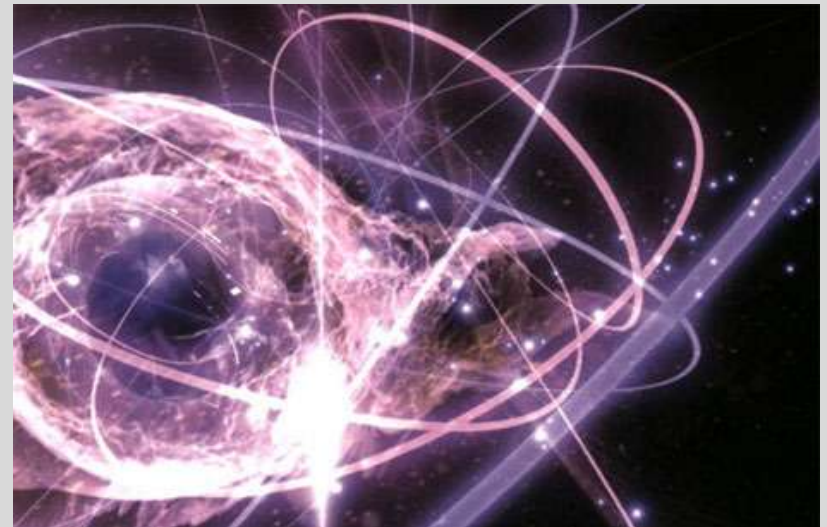
- **New block cipher**
- **New stream cipher**
- **New hash function**
- We are developing a simulator which is able to test following features:
 - ✓ Nonlinearity
 - ✓ Completeness
 - ✓ Strict avalanche criterion
 - ✓ XOR table distribution
 - ✓ Diffusion order





- **The Quantum Cryptography** ensures the highest security, because it is not possible to eavesdrop the communication in passive way. If an eavesdropper reads the distributed key, it will change the quantum states of the photons and will be disclosed.

In INDECT WP8 we are developing a high-level security protocol allowing to apply the quantum cryptography in communication networks





- To achieve a proper level of security and privacy
– the **correct balance between security and privacy**
- Obligation to get an **informed consent** regarding participation in the research especially related to security purposes
- **Equitable selection** of participants to avoid incorrect choice between different groups of the society (such as prisoners, children, etc.)



#	Name	Partner	Background
1 (EIM)	Drew Harris	PSNI	Police
2	Zulema Rosborough	PSNI	Police
3	Ralph Roache	PSNI	Police
4	Plamen Vichev	TU-Sofia	Academia
5	Henryk Tusiński	External	Police (Ret-d)
6	Helen Petrie	UoY	Academia
7	Andreas Pongratz	X-art	Industry
8	Mariusz Ziółko	AGH	Academia
9	Emil Pływaczewski	External	Academia
10	Tom Sorell	External	Academia



- INDECT 's main objective is to contribute, through technology and innovation, to security of European citizens
- Ethics Board role and objectives
- **Re-utilizing the already available information sources** (like: existing cameras, Web pages)
- **Lower the level of subjective assessment** and the number of human mistakes
- **Less opportunities for illegitimate use** of the monitoring records



- **No 'mass surveillance'** is intended - only for cases where justified reasons for infringement exist
- Use case scenarios considered within project focus on particular **crime categories that the society is sensitive to**
- INDECT outcomes will make the stored and transferred **information safer from unauthorized use**



- Project Objectives from HR perspective
 - **INCREASE the privacy** of persons being in the range of monitoring systems
 - **Registration and storage** of ONLY such situations which are related to a **threat to security** instead of collecting ALL monitored scenes
 - Monitoring systems ARE installed in large scale ANYWAY



- Addressing Ethical Issues in INDECT
Deliverables and Dissemination Activities
- Dedicated Session at INDECT
Conferences/Workshops
- Common 'Framework' for **reacting to
external questions/publications**



- Providing Exemplary scenarios showing expected positive impact of INDECT on enhancing security of citizens and protecting their privacy
- More frequent Ethics Board meetings
- Cooperation with other projects (**DETECTER**)

**THANK YOU FOR YOUR
ATTENTION!**





SUBITO	INDECT
<p>Detection of abandoned objects, assess the threat and provide pre and post event tracking of their owners.</p>	<p>Algorithms for object tracking and classification. Therefore based on that various tools can be build.</p> <p>One of the considered tools is a detector of abandoned luggage (but not only) and tracking of the owner. The same approach (tracking and classification) is used also for detection of events in road traffic, loitering, entering protected area, falling, etc.</p>



SUBITO	INDECT
Stereo based solution to lighting invariant background subtraction	For object tracking also stereo vision (two paired cameras) setup is utilized. Current results show that it provided robust separation of foreground object and the background
Novel fusion of the outputs of independently run tracking algorithms	Object tracking is performed utilizing both single camera setup and stereo camera setup



SUBITO	INDECT
<p>Categorisation and identification of objects will be achieved through fusion of a number of visual cues including size, gait, shape and appearance</p>	<p>Categorization is made into classes: person, car, inanimate object (left by a person), small animal, based on the shape and size. Currently gait is not analysed but it is considered, and new methods for texture (appearance) parameterization are being developed</p>



SUBITO	INDECT
<p>Guided by end-user requirements to ensure that security personnel receive the technologies they need</p>	<p>While developing our tools we consult and cooperate closely with End-Users, namely Polish and Irish Police.</p> <p>Developed solutions can be utilized both in small, private surveillance, as well as in corporate, or large scale (mass events, stadiums, train stations, airports).</p> <p>Alerts of detected events are distributed in dedicated communication network, and the operator can easily forward them to mobile terminal to forces in the field</p>