



P-REACT

Petty cRiminality diminution through sEarch and Analysis
in multi-source video Capturing and archiving platForm

P-REACT Scope

Petty Crimes (also known as volume crimes) take place on a daily basis affecting citizens, local communities, business owners and infrastructure owners. Petty Crime incidents such as theft, criminal damage and anti-social behaviour are on the rise in Europe due to the economic crisis, in turn these incidents adversely impact the local socioeconomic environment. The P-REACT solution will focus on connecting citizens, business owners, infrastructure owners and security, and law enforcement personnel so that Petty Crime incidents can be effectively dealt with

and prevented in the future.

The P-REACT project will design and develop a low cost surveillance platform that will detect Petty Crime incidents. The solution will encompass intelligent video and audio sensors to detect Petty Crime incidents, a cloud based monitoring, alert detection and storage platform.

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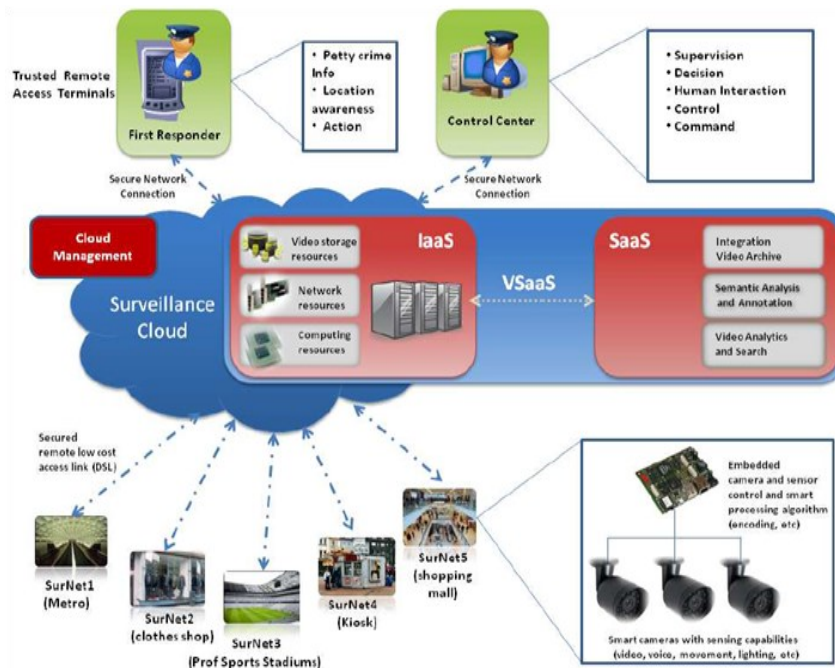
Project details

Start date: 2014-04-01
End date: 2016-03-31
Duration: 24 Months
Reference: GA n° 607881
Budget: 1,893,606.00 €
Funding: 1,489,396 €
Call: FP7-SEC-2013

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Concept Design



Following the successful work undertaken in the first period of the project life, **the second semester saw the partners working fruitfully**, significant progress was made especially with regard to the development of software and hardware components of the system.



The End-Users Advisory Board

The P-REACT project is focused on impacts of Petty Crime on citizens, business owners, infrastructure owners and security and law enforcement personnel. The research will seek to develop a solution based around the needs and concerns of these key identified users in an urban environment.

To enrich the functionality of the system, P-REACT has built End-Users Advisory Board (EUAB),

***“P-REACT
is an end-user
driven solution”***

composed by potential end-users and Law Enforcement Agencies with the aim to provide feedback on the project key topics. The EUAB collaborates, as an advisor, to any relevant activities during the

project, evaluating relevance of decisions and results, guaranteeing the sustainability of the solution.

So far, the following organizations expressed their interest to serve as EUAB members:

End-Users



Hellenic Police
(Greece)



Cypriot Police
(Cyprus)



Udaltzaingoa/ Guardia Municipal
(Spain)



Cyta (Cyprus)



TRAINOSE S.A
(Greece)



RAILWAY PROCUREMENT AGENCY (Ireland)



ICTS HELLAS
(Greece)



TPER SPA
(Italy)



ISS SECURITY S.A.
(Greece)



Comune di Bologna
Municipality of Bologna
(Italy)

P-REACT



PYRSOS SECURITY
S.A. (Greece)

Interview with the P-REACT Project Coordinator

“The P-REACT project is reaching its final stage” – said Mr. Arraiza from VICOMTECH in San Sebastian (ES) – “Indeed, the P-REACT is a 24 months duration project that started in April 2014 and will finish in March 2016.” An interview with Mr. Juan Arraiza, in its role of P-REACT project coordinator, provides useful information about the development of the P-REACT system.

At what stage is the progress of the project? “As today (October 2015), the development of all the components of the P-REACT solution is almost completed and the focus of the technical work is on integration, testing, and preparation of the trials that will take place in the final phase of the project. The progress made so far and the results obtained from the preliminary tests have reinforced the willingness of the project team to continue working hard in order to deliver the best possible advanced prototype of the designed P-REACT solution by the end of the project”.

Are you planning to further promote the project? “It is expected to increase the effort and tangible outcomes in the area of scientific publications and other dissemination activities during this last stretch of the project. At this stage a first version of the business model and exploitation plan has been completed. This initial version will be extended and improved within the following months. Last but not least, two final trials will take place in February (Athens) and March (Bologna) next year. Life demonstrations of the P-REACT solution in operational environments will be given to practitioners and other stakeholders”.

The P-REACT Consortium Meeting in Thessaloniki

The 5th P-REACT Consortium Meeting took place in Thessaloniki (Greece) on 2015, the 30/09 and 01-02/10, hosted by CERTH. The Consortium Meeting was preceded by a Technical Meeting closed to only the technical partners. The two meetings let the project partners to provide themselves the last updates about the project activities, discuss in-depth the following tasks, and work together for the P-REACT system development. Hard work was accomplished to complete the development of several system's components, and to test them. For the next period, the challenge will be the integration of such components, and their adjustment to the real condition of the trial. Indeed, a specific session was dedicated to the planning of the two trials that will take place in Athens and Bologna on 2016: KEMEA and SRM, respectively hosts of the trials in Athens and Bologna, provided other partners with the description of the areas where the P-REACT system will be tested. Some possible hurdles already arose, involving both the technical and the operational aspects, and the consortium started the work to overcome them. After the two meetings, the partners came back home having clear that the project is running as planned, but hard work is still to be accomplished to successfully conclude the project.



Participation in the 9th Summer Safety & Reliability Seminars

ADITESS took part in the 9th Summer Safety & Reliability Seminars organised by ESRA and PSRA that took place on June 21-27, 2015 in Gdansk/Sopot, Poland (www.civitas.eu/content/civitas-forum-conference-2015). This annual one-week event is organised to advance the methods for the safety and reliability analysis of complex systems and processes and to disseminate the newest achievements in the field.



Mr. Nikolaos Koutras, Director of ADITESS, represented the P-REACT project and made the presentation of the accepted by the organized committee paper: “Fighting volume crime: an intelligent, scalable and low cost approach”. Through the presentation of the P-REACT paper, ADITESS analyzed the project novel intelligent surveillance solution that integrates video and audio analytics both on-site (using an embedded platform connected to local sensors) and centrally on a cloud service. This intelligent surveillance system, intended as a modular and low cost solution, has

P-REACT Trials



Two trials will be organised and conducted in 2016 to test the P-REACT system under near to real life conditions: The first one will take place in Athens in February, while the second one in Bologna in March. The scope of the trials is two-fold. On the one hand to test and demonstrate P-REACT underlying technologies and the maturity (Technology Readiness Level –TRL) of the whole system, and on the other hand to grasp the interest of the external audience and show P-REACT applicability for future exploitation of project products.



End-users and stakeholders will be invited to participate in the trials and evaluate the P-REACT solutions. This way, they will be able to directly observe the innovative functionalities introduced by P-REACT, and consider the benefits they may introduce into their business area. Furthermore, their feedback will be precious to further improving the system, and make it more fitting with real world requirements.

During the trials, a showroom will be arranged where external experts and reviewers will be hosted, and get familiar with the project and the trials. A live video streaming will be provided from the trial areas, to let participants follow the trials on real time. Additional information about the trials will be provided in other screens and panels, while a facilitator will describe and comment the scope of the actions.



The trial in Athens will concentrate on use cases in indoor environments, considering petty crimes in small shops and gas stations. Therefore, the audience will be composed mostly by representatives from related target groups, e.g. Gas station companies/associations, chamber of commerce/business networks, security companies, Police forces, public administration, and the like.

The trial in Bologna will be related to test use cases in outdoor environment, investigating anti-social behaviours and petty crimes in public transportation areas.

The audience will comprise stakeholders involved in

the transportation sector (public and private), transportation services providers and managers, and public Authorities.

Article in Thinking Cities

The magazine “Thinking Cities”, in its issue of May, 2015, hosted an exhaustive article describing how the implementation of the P-REACT system could improve the security feeling of public transport users, and then the public transport in general. The magazine is published by H3B Media in association with Polis, a network of Cities and Regions focused on smart transport and sustainable mobility and innovation at European level (<http://thinkingcities.com/>). In the article, the main challenges to be tackled in the city of Bologna are presented, related to the protection of the public transportation systems.

Results of the yearly survey conducted by SRM on public transport as perceived by users and potential users were explained. Security factor (first of all at bus stops) seemed to be of high importance for the passengers, and it is declared as being part of the “expected quality”. And one of the objective of the P-REACT project is just to test a video-surveillance system aimed to increase the security (and its perception) for public transport passengers. Indeed, an incident detected by the sensors are supposed to initiate a workflow including alerting relevant security personnel, or the Police, with video, audio and intelligence information, increasing their ability to respond quickly and appropriately. As reported in the article, the P-REACT system will be tested in the field in Bologna at the beginning of 2016: low-cost intelligent sensors (video and audio) will be installed in a transport relevant location, and these sensors will be connected to a cloud-based Video Content Management System to process the data.

Participation in the 13th CIVITAS Annual Conference (CIVITAS Forum 2015)

SRM participated actively in the 13th edition of the CIVITAS Forum Conference that took place in Ljubljana (Slovenia) between the 7th and 9th of October, 2015 (www.civitas.eu/content/civitas-forum-conference-2015), with the focus on sustainable urban mobility. About 400 people were registered in the working sessions, and the participants consisted of representatives of cities administrations and government, researchers and professionals in the field of Transportation and Urban Mobility at European level.

A stand was assigned to SRM in order to promote the initiatives in which SRM is involved in at European level. The P-REACT leaflet and newsletter were distributed, and people were introduced to the project, its objectives and expected results. Personnel of SRM directly involved in P-REACT provided information on the system under development, and the components and the several features of the P-REACT were described. Greater interest of attendees pointed towards the potential applications in the sector of Transportation. Anyway, the possible employment of the P-REACT system in other sectors (such as to control shops and stores, and small areas) generated a considerable attention.



The Technician's Corner: An incoming scientific paper on Audio Analytics

The P-REACT consortium has successfully submitted a scientific paper entitled "**A cost effective solution for audio surveillance using embedded devices as part of a cloud infrastructure**" to the Big Data, Knowledge and Control Systems Engineering conference (BdKCSE'2015) organised in Sofia, Bulgaria during the 5th and 6th of November, 2015.

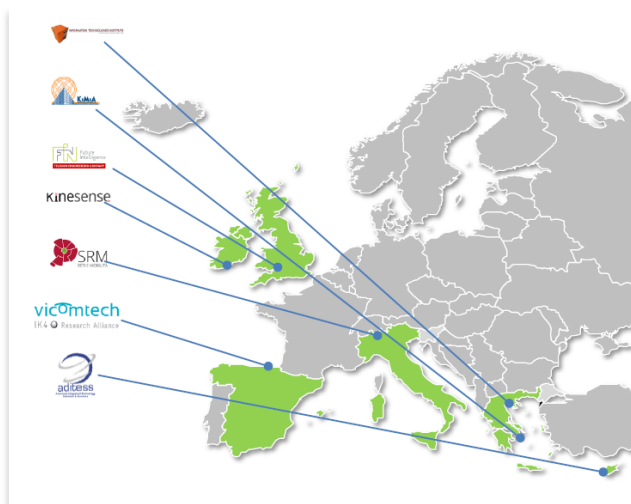
More specifically, in this paper an ethical audio surveillance system developed for the cost effective and real-time detection of auditory events of interest developed for the needs of PREACT is presented. The work done on audio analytics is motivated by the fact that the lack of audio in surveillance systems impacts significantly the ability of security personnel to act timely, if at all, in cases of emergency.

The implementation of the proposed system foresees the utilisation of a low-cost embedded system for the recording of audio and the first level of event detection, with lightweight analytics, and a virtual machine hosted on a private cloud, for the execution of second level event validation. Experimental results suggest that 8 kHz mono audio is sufficient for the real-time processing of data with not much degradation in classification performance. Paper results indicate that effective classification on the embedded system is performed based on a cascaded implementation of C4.5 classifiers while audio classification on the cloud side implements four very well-known methods: C4.5, Random Forests, Support Vector Machines and k-Nearest Neighbours. Reported evaluation on the algorithms' performance is validated against the classification accuracy and area under the receiver operating characteristic (ROC) curve (aka AUC).



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Contacts

Do you want to know more about the P-REACT project?
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