

SECURITY

Per informazioni: "Valentina Tegas" <tegas@apre.it>

Riferimento: SEC-PT-SMCP-5

Data Scadenza: 30/05/2007

Programma: SICUREZZA

Titolo: BADCAR (Behavioural Analysis and Detection of Vehicles in Communal Areas)

Descrizione: The objective of the project is detection and recognition of suspicious and abnormal behaviour of vehicles in controlled small or wide land areas.

PROJECT DESCRIPTION

Proposal Outline:

A multi sensor network is considered in this proposal consisting of video, acoustical and other physical sensors. Typical urban security scenarios are considered with the aim of prevention of using vehicles as weapons to destroy critical establishments. The sensor network and related algorithms are to be developed for deployment at controlled areas around critical infrastructures such as consulate buildings and financial institutions. The aim of the project is to detect and flag suspicious vehicle activity and possible threats and bring these information selectively to the attention of security personnel and operators of the system. The system that will be developed during the course of this project will allow prevention or minimize the catastrophic results of suicide attempts. Another side result of the analysis will be detecting vehicles involved or to be involved in a crime.

Proposed work packages:

WP0 Management

WP1 User requirements and scenarios

WP2 Video-based surveillance

WP3 Audio based analysis

WP4 Other sensors

WP5 Data fusion and behavioural analysis

WP6 System integration

WP7 Dissemination and exploitation

Keywords:

Image/Video Analysis

Audio Analysis

Sensor Integration

Data Fusion

Distributed Computing

Call Identifier: Security Call 1 (FP7-2007-SEC-1)

Activity: 2. Security of infrastructures and utilities

Area: 2.3-02 Detection of abnormal behaviour of vehicles & threats both in wide and small land areas

Tipo Ente: Impresa

Partner richiesto: Required skills and Expertise:

Expert in Image/Video Processing

Expert in Audio Processing

Expert in Data Fusion

Expert in Distributed Computing

Expert in Behavioral Modeling

Description of work to be carried out by the partner(s) sought:

Development of work packages

Participation in proposal preparation

Type of partner(s) sought: End-Users -SMEs

The Proposer is looking for a Coordinator: No

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Riferimento: SEC-PT-SMCP-4

Data Scadenza: 30/05/2007

Programma: SICUREZZA

Titolo: UDM (Uncertain Decision Making)

Descrizione: The objective of the project is to provide decision support under uncertainty with a proper human interface for moving between possible outcomes efficiently and quickly.

PROJECT DESCRIPTION

Proposal Outline:

The ability to deal with uncertain information in a straightforward and natural way is expected to: improve the quality of planning; enable more rational responses to unexpected events; provide new levels of situation awareness; and allow a better understanding of available options. These enhancements to the decision making process will enable people and machines to make better decisions in less time and with lower costs in any command and control system. Another aspect of the project is to display the results in a suitable format that will speedup the decision process. The user should be able to move between available options monitoring easily all positive and negative aspects with attached probabilities and possible results of that decision.

Proposed work packages:

WP0 Management
WP1 Statistical Analysis
WP2 Multi-Sensor Integration
WP3 Data Fusion and processing
WP4 Optimization
WP5 Decision Algorithms
WP6 Human Interface Design
WP7 System integration
WP8 Dissemination and exploitation

Keywords:

Uncertainty
Information Theory
Decision
Information Theory

Call Identifier: Security Call 1 (FP7-2007-SEC-1)

Activity: 4. Restoring security and safety in case of crisis

Area: 4.3-02 Intelligent decision support

Tipo Ente: Impresa

Partner richesto: Required skills and Expertise:

Statistical analysis
Decision algorithms
Optimization

Data Fusion

HMI Design

Description of work to be carried out by the partner(s) sought:

Development of work packages
Participation in proposal preparation

Type of partner(s) sought:

Universities and Research Centers

End-Users

SMEs

The Proposer is looking for a Coordinator: No

Per informazioni: Valentina Tegas - tegas@apre.it

Riferimento: SEC-PT-SMCP-1

Data Scadenza: 31/05/2007

Titolo: Improvised Explosive Materials: Properties, Detection, Neutralization

Descrizione: The scope of this proposal includes investigation of properties and characterization of these explosives, which represent a rapidly growing threat to public security posed by terrorist organizations worldwide. Obviously, the development of detection technologies is of particular importance because standard methods and devices that are

currently deployed in airports and other public facilities for detection of conventional explosives cannot detect the peroxides. We are looking for corporate and academic partners to complement the existing consortia. Please let us know whether your organization would be interested in joining this research effort and what would be your contribution.

Abstract - Peroxide based explosive, including TATP, DADP and HMTD represent a growing challenge to public security. The threat arises primarily from the fact that these explosives are easily prepared from cheap raw materials that are available in the free market and from the fact that these explosives are quite difficult to detect. Neither training nor experience is required for the synthesis of these explosives and for their use in improvised explosive devices (IEDs). Furthermore, these materials, which serve as both detonator and main charge, can be initiated by a spark, minor friction or impact. It is particularly alarming that various terrorist groups have started to combine these sugar-like substances with various polymeric binders and pigments to produce plastic explosives that are soft, and hand malleable, more resistance to mechanical stress and have the benefit of being less sensitive than the crystalline substance and can be molded into innocent-looking toys, food or household items. Obviously, there is an urgent need for the development of detection and identification technologies. In addition, there are many other aspects of the problem that should be pursued. These include comprehensive study of their chemistry and properties, including post blast analysis and identification of the type, fast and reliable on-site neutralization of captured material, identification of the manufacturing method, as well as origin of the captured explosives.

The Work Plan - the proposed work plan comprises eight Work Packages:

WP1 Synthesis and characterization of Improvised Explosives

- Study various synthetic methods of TATP, DADP, HMTD and their analogs.
- Determine physico-chemical properties and characterize the various peroxides.
- Prepare plastic peroxide explosives using various binders and dyes.
- Study the above described compounds by XRD, DSC and X-ray crystallography.
- Study the metal binding properties of TATP by isothermal calorimetry and NMR.

WP2 Study of the explosion parameters by a fast camera

- Study the decomposition pathway by monitoring with a fast camera.
- Study methods of initiation.
- Study the spectral parameters of the explosion.

WP3 Effect of binders and solvents.

- Study composition sensitivity and properties.
- Develop detection technologies.
- Post blast analysis.

WP4 Development of detection methods

- Detection of explosives in captured materials and on suspected surfaces
- Development of specific sniff-detectors for gas phase detection.

WP5 Neutralization of captured materials

- Controlled neutralization of peroxide explosives in urban areas.
- Removal and handling of peroxide-based explosive devices.

WP6 Dissemination and Exploitation

WP7 Management

Tipo Ente: Centro di Ricerca

Partner richiesto: We are looking for academic and industrial research groups who has an interest in basic and applied research on improvised explosive materials and are specialized in the followings fields:
Energetic materials Analytical methods for gas-phase detection of explosives
Chemical, biological and nanotechnological sensors

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Riferimento: SEC-PT-SMCP-2

Data Scadenza: **31/05/2007**

Programma: **SICUREZZA**

Titolo: Smart Surveillance Network Camera

Descrizione: The proliferation of surveillance cameras in major cities all-around the world is a known fact. Yet, public concerns related to personal privacy and 'big-brother' syndrome aside, their effectiveness in decreasing the crime rate and their value as an anti-terrorism tool are currently being questioned. Despite multi-billion dollar investments, the experience in the field has proved that the capabilities of such systems are far below the required minimum for providing decisive results and connecting cameras to expensively-manned control rooms is not always a viable option. Consequently, surveillance systems of higher intelligence are in high-demand for both public and private applications.

We propose to develop a Smart Surveillance Network Camera with the following features:

- object recognition
- activity recognition
- multi-camera single-stream tracking and recording
- remote programmability
- cooperative operation
- open-architecture for accommodating value-added software and services provided by the third-parties

PROJECT DESCRIPTION

Proposal Outline:

A Smart Surveillance Network Camera system will be having four basic building blocks.

- A high-speed communication network
- An intelligent connection box for connecting cameras to the network
- A computer for storing video streams, viewing, communications with the outside-world and software upgrades and maintenance
- A number of surveillance cameras

The Intelligent Connection Box (ICB) is the core component of the system.

Each ICB is individually programmable for a number of tasks over the network using the control PC. A given task definition includes code, relevant data and a list of events of interest to be reported. Thus, the system is capable of raising an alarm and sending and receiving requests from other ICBs. ICBs will be designed as single and multiprocessor units with the ultimate aim of being integrated with the camera into a single unit. In the multiprocessor version, the visual data stream from the camera will be broadcasted to processors simultaneously and the unit will operate in a Multiple-Instruction-Single-Data fashion so that a larger number of tasks can be carried out concurrently. Upon completion of the project, the system should be able to support the following scenarios for the private user.

1. Detecting and recording people who enter the front yard of the house. If instructed, alerting the user by e-mail or an MMS message to a preset GSM phone number.

2. Detecting and recognizing three cars belonging to the household and monitoring activity around them after the car is parked. Alerting user by any of the above means when people come into physical contact with the cars or hang around them for too long.

Upon completion of the project, the system should be able to support the following scenarios for the official user.

1. Broadcasting digital photos of a person to cameras to start a metropolitan area-wide search.

2. After the detection of the person involved, initiation of a tracking session by the human operator. As the target moves, s/he may enter and leave the fields of view of many cameras but whole tracking session will be combined into a single visual data stream and will be recorded as such.

This capability requires a target object handover mechanism somewhat analogous the call handover mechanism in GSM networks so that a camera can be associated with the tracking session and released as required.

3. Recognizing the acts of sabotage to camera itself (such as changing the direction of the camera, spray painting the lens or covering it by any other means) and requesting other cameras to record the event when cameras are placed to include each other within their fields of view.

We also intend to make our platform available to other researcher and developers in the field so that by following a set of guidelines, they will be able to provide value-added services of their own to the end-user (such as monitoring the activities of the elderly or pets in the house when they are all alone) without having to worry about device drivers, communications and process management infrastructure.

We have considerable experience in designing and developing industrial vision processing systems. We developed an optical sorter which is capable of separating coal from stone using a camera and high speed air valves. A single camera image is used for controlling 100 valves and the system is capable of processing 24-bit true-color images over 90 fps. Valve controllers, communication hardware and related embedded software is also designed and implemented by us. We also developed an optical classifier for classifying cut and polished marble tiles according to their color and vein structure. The system is capable of processing 640x480 24-bit

true-color images at 60 fps and works with both USB web-cams and high-end industrial-quality Firewire cameras. Our ongoing project is about surveillance of people and their activities over a camera network. We are particularly interested in developing a system which is capable of automatically recognizing a person depositing an object and leaving, and bringing the event to the attention of the human operator.

Tipo Ente: Impresa

Partner richiesto: Required Skills and Expertise:

- Camera manufacturers
- Embedded systems designers and developers
- Device driver designers and developers
- Communications protocol designers and developers
- Object detection/recognition algorithms developers
- Activity detection/recognition algorithms developers

Description of work to be carried out by the partner(s) sought:

- Developing intelligent connection boxes
- Developing device drivers
- Developing object detection/recognition algorithms
- Developing activity detection/recognition algorithms
- Integrating the algorithms to the embedded environment
- Developing system management software for the control PC
- Field testing of the prototypes in real-life environments

Type of partner(s) sought:

Industrial, Research Institutes, Academics, End Users from Law-Enforcement Agencies

The proposer is looking for a Coordinator.

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Riferimento: SEC-EU-SMCP-3

Data Scadenza: 30/05/2007

Programma: **SICUREZZA**

Titolo: CAPELWAR (Capillary Electrophoresis of Potential Chemical and Biological Warfare Agents)>

Descrizione: Main scope: Prediction of Analytical Properties and Detection of Potential Chemical and Biological Warfare Agents by Capillary Electrophoresis

Objective: This proposal aims to develop a portable field instrument capable of detecting possible warfare agents on the spot. This instrument will base on capillary electrophoresis (CE) method which, due to the small geometrical dimensions of the capillary and detection systems, recommends itself as a good candidate for compact portable field instrument that could possibly be used for the analysis of CBWA on the spot.

PROJECT DESCRIPTION

Proposal Outline:

CE is a separation method which bases on the differences of migration of the analytes under electric field. Compared to the other analytical methods (chromatography, or spectroscopy) CE has small sample consumption (L), speed of analysis is high (minutes), and detection limits are low (ppm). Also CE instrumentation is rugged and simple and can be miniaturized to be a prototype of a field instrument. In general capillaries are disposable. In the proposed instrument the detection of the analytes will be performed by contactless conductivity detector (CCD) which measures analyte conductivity in separation media and have reduced dimensions compared to optical detectors. Due to the availability of various electrolytes as separation media and affinity probes, the specific protocols for large spectrum of CBWA can be designed.

SEC-2007-1.3-03 Localization and tracking of components of substance production

Tipo Ente: Università

Partner richiesto: Keywords:
Chemical and Biological Warfare Agents (CBWA)
Portable field instruments
Capillary electrophoresis (CE)

PARTNER PROFILE SOUGHT

Required skills and Expertise:
Expert in chemical analysis - separation methods
Expert in analytical instrumentation

Description of work to be carried out by the partner(s) sought:

Participation in proposal preparation and development of work packages
Design and upgrade of instrument for use on the field

Type of partner(s) sought:

Instrument developers, End-Users

The Proposer is looking for a Coordinator: YES

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Riferimento: SEC-PT-LCP-1

Data Scadenza: **31/05/2007**

Programma: **SICUREZZA**

Titolo: MINIPATROL- Miniaturized Multisensored Patrolling System For Airport and Other Check Points Security

Descrizione: Our main objective is to protect individuals and infrastructures against potential terrorism attacks and also to detect narcotics by developing an advanced integrated mobile security system.

MINIPATROL is an explosive and narcotic drugs advanced detection and alerting system especially useful for airports and other check points.

DESCRIPTION OF THE WORK

MINIPATROL is an explosive and narcotic drugs advanced mobile detection and alerting system. It is composed of miniaturized patrol vehicle(s) equipped with multiple sensors, auxiliary mobile/fixed sensors communicating with the patrol vehicle and command room, video cameras including also night sight system, and a command room.

Main Work Packages are related to:

- Mobile chemical sensor system development for explosives and narcotic drugs detection
- Miniaturized vehicle design and development
- Sensor system integration on a miniaturized patrol vehicle
- Remote control (Tele-Operation) of patrol vehicle and communication between patrol vehicle(s), mobile/fixed sensors and command room
- Integration with automatic video analysis and night sight systems

Topic in the Work programme Intelligent Surveillance and Border Security
SEC-2007-3.2-03, SEC-2007-3.2-01, SEC-2007-3.2-02
(3.2 Integration Projects)

Tipo Ente: Centro di Ricerca>

Partner richiesto: Target Partners' Organisation type:
Consultancy, Research, Education, Industry, Non-Commercial, SME

Target Partners' Expertise:
Vision Systems (Optical and Infrared Sensor Technologies), Remote Control,
Communication Technologies, Unmanned Vehicle Developers
CONTACT DETAILS

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Riferimento: **SEC-PT-SMCP-6**

Data Scadenza: **28/05/2007**

Programma: **SECURITY**

Titolo: **Improvised Explosive Materials: Detection, Identification and Authentication**>

Descrizione: The proposed project will address the theme listed below, by the development of detection and authentication technologies for improvised explosive devices (IEDs).

Activity 1: Increasing the Security of citizens Topic SEC-2007-1.3-01 Stand off scanning and detection of hidden dangerous materials, objects or stowaways, fast and reliable alerting and specification.

This focus arises from the fact that standard methods and devices that are currently deployed in airports and other public facilities for detection of conventional explosives cannot detect peroxide-based improvised explosives. Within the scope of this project we expect to provide the POC (Proof of Concept) and set the groundwork for commercial development of the desired system.

Other essential goals are:

1. Characterisation of peroxide-based explosive materials in both crystalline and amorphous states using various synthetic procedures.
2. Characterisation of plastic compositions of these peroxide based explosives using conventional binders used by the explosives industry as well as methods and binders that have been used by terrorists.
3. Development of detection methods of the above materials using both chemical spectral and other approaches, including stand-off methods.

The prepared peroxides will be examined with a variety of sensors, fast camera and other input devices in order to monitor the explosion properties and decomposition pathway. These include comprehensive study of their chemistry and properties, including post blast analysis.

The proposed project offers collaboration between academic, industrial and security organizations to develop analytical methods for characterization of captured samples and determination of the manufacturing procedures used by terrorist groups.

Safety, Improvised explosive devices, IED, Assessment of Risk, detection, peroxide based explosives, chemical detection, spectral detection, x-ray detection, pre-concentration, mass spectroscopy, IMS, stand-off detection.

Tipo Ente: Università

Partner richiesto: Target Partner Organisation Type(s) :
University, Research institute, national institute, SMEs, large industrial companies, end users.

Target Partner Expertise Sought :

The coordinator is looking for partners capable of performing one or more of the following:

- Risk Assessment of improvised explosive devices (IEDs)
- Development methods for Explosive Detection (e.g. IR laser)
- Development of Stand-off detection solutions
- Development of Identification and Authentication methods for IEDs (e.g. chemical and bio-chemical detection).
- System Integration
- End user/Field testing facilities (airport authorities)