
JRC participated in DG ENV’s 3rd Civil Protection Forum and within this context organized the 1st Euler Workshop on End-User Involvement & Dissemination. EULER is an FP7 project on EULER - European Software Defined Radio for Wireless in Joint Security Operations. The EULER event was a combined end-user workshop as defined by WP2 and dissemination event as defined by WP8 of the project. The workshop presented the crisis scenario of tsunami where the deterioration in public services could be sudden. The end-user feedback was also to devise other less extreme scenarios in which typical end-user can easily imagine (him) herself. An alternative scenario of widespread floods seasonal floods may be considered where the services would deteriorate gradually yet with deeper and deeper consequences.

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STA Unit presented two papers on Airport Security and Border Control:
1. Advanced Registered Traveler Paradigm Using Dynamic Risk Profile and Multimodal Biometrics.
2. Joint Model for Usability and Security of the Passenger Process in Airports: Registered Traveler (RT) program is an automated border control tool for homeland security. In the first paper, the authors introduce a process-based approach for dynamic risk assessment using fuzzy logic in the RT program. A multimodal biometrics demonstrator is deployed for strong identification of passenger in departure process. In the second paper, authors analyse the usability of the passenger process alongside the security risk which are assessed using the cognitive walkthrough method. Results are presented for the disabled passengers with cochlear implant. The framework can be used at the design stage for usability and risk evaluation of new security technologies, thus avoiding new technological barriers.

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The Unit participated at the conference presenting two papers. Overall the conference had an attendance of about 80 researchers and practitioners from industry, government and academia. There were a number of questions on the level of maturity of the technique and possible use on an operational basis. This point will be addressed in the coming months when we create an archive of gait signatures of various people, giving the possibility to establish the potential of the technique in scenarios such as automatic identification of individuals approaching a control point. Dr Fortuny gave a talk on the human gait recognition using radar and Mr Baldini presented the paper “The Use of Secure RFID to Support the Resolution of Emergency Crises”, co-authored with F. Oliveri (STA Unit), H. Seuschek, E. Hess and M. Braun (Siemens).

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University of Texas at Austin USA, 17/12/2009

CORSAs made a visit to the University of Texas (UT) at Austin. Pravir Chawdhry met Professor Todd Humphreys of Satellite Navigation Laboratory and Professor Jeff Andrews who heads the Wireless Networking and Communications Group (WNCG), with the aim to explore avenues for R&D collaboration. Whereas WNCG activities have a striking resemblance to the profile of the CORSAs action in JRC, the group has high critical mass making it an attractive proposition for collaboration on state-of-the-art technologies through common projects. Work in the UT Satellite Navigation Lab is focussed on the security of global navigation satellite systems (GNSS), an area of strategic interest to CORSAs in view of the European stakes in the Galileo programme. Following this visit and Prof. Humphreys’ earlier visit to Ispra concerning the “Hardening of GNSS tracking devices”, the two groups intend to work together on the risks of GPS spoofing and countermeasures at both theoretical and experimental levels.

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Training on Standardization for EC R&D project officers
Brussels, 20/10/2009

DG ENTR had organised this second training on the interaction between standardisation and research for EC R&D Project Officers. The objective was to highlight how research can contribute to standardisation and, on the other hand, how research projects can benefit from standardisation. A number of speakers from standardisation bodies (CEN, CENELEC, DIN, ETSI) had been invited. The JRC had been invited to present a case study based on an actual research project.

Mr Baldini presented the case of Ultra Wideband (UWB) research, where the JRC made a number of contributions to standardisation (ETSI ERM TG UWB) as well as to radio spectrum policy (DG INFSO). The presentation was well received by the organisers as a very practical example for the benefits of a close relation between research and standardisation. Javier Arregui of DG ENTR (Chairman) was especially interested to the presentation, because his unit is going to work in the area related to spectrum management and related technologies like UWB, Dynamic Spectrum Management and RRS.

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Presentation of the PHYReLab FP7/ICT project proposal
Brussels, 12/10/2009

The Unit participated in the draft project proposal presented to DG INFSO. PHYReLab stands for Physical Layer RF environment Reference Laboratory for future Internet wireless access concepts. PHYReLab is a new competitive project proposal that is intended to be launched as a follow-on project to FP7 project WALTER in the frame of the FIRE initiative under ICT Call FP7-ICT-2009-5. PHYReLab is an IP with an estimated total budget of EUR 5-6 M. The consortium currently consists of 13 partners from industry and academia.

The objective of PHYReLab is to research RF interference in wireless access networks that form the edge of the Internet and to create a network of interference reference laboratories. To study interference issues under realistic conditions the individual laboratories will focus on specific environments (home, industrial, automotive, medical, entertainment); with the target to create one virtual universal interference lab that will cover existing and emerging wireless technologies and address all major application areas.

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Meeting for Inter-service Consultation on the GNSS Action Plan.
Brussels, 6/10/2009

The STA Unit participated to the 3rd Meeting of Galileo/EGNOS work group organized by DG TREN. IPSC is currently working on a number of applications related to Global Navigation Satellite System (GNSS) and provides valuable input to the work group especially in relation to aspects of protection and security. In addition, discussions were held with DG-TREN on the definition of a GNSS Security Annex for IPSC/TREN MoU on Transport. DG TREN presented the EGNOS/Galileo Action Plan. In this a number of actions could be of interest to IPSC for high impact policy support. Complementarities will be sought in particular among GNSS and GMES. An interesting note was that EGNOS is already used in the agriculture sector to improve the precision in measuring the land or for other agriculture applications like tractor guidance and implement guidance, ploughing, seeding and spraying and supervised tracking of livestock.

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ETSII / WALTER Workshop
Sophia Antipolis, 6/10/2009

As a member of FP7 project WALTER, Wireless Alliance for Testing Experiment and Research, CORSA participated in the technical workshop organized by the ETSI. The aim was to present the project activities and results achieved by WALTER, covering the current regulatory, standardization and research status of UWB technology, interference mitigation techniques and related challenges in testing & measurement. The workshop drew about 30 participants from Europe, the US, Japan, and China. In parallel to the workshop, ETSI also arranged an UWB interoperability test as a follow-up to the previous event organized by JRC in its EMSL laboratory in Ispra in July 2009. In the session on technical challenges and issues of measuring UWB, Mr Fuehrer gave a presentation of the cryogenic LNA module that had been developed by the STA Unit and of the results of the UWB measurements carried out with this LNA. The conclusion from this session was that with the current regulatory constraint, radiated measurements of UWB transmit power, as required by ETSI are simply not possible.

ETSII Technical Group on Ultra Wideband Workshop.
Stuttgart, 8/10/2009

Bosch in Stuttgart hosted an ETSI TG UWB meeting to discuss issues and possible solutions for measurements of MB-OFDM and pulsed UWB systems. Among the participants were representatives of major test equipment manufacturers, such as Rohde & Schwarz and LeCroy. The objective of this meeting was to update and improve the description of test procedures and parameters in ETSI document TR 103 181. In the beginning of 2009, FP7 project WALTER had already provided inputs for this technical report. Results of measurements that had been done with Thales in the EMSL laboratory of JRC during the July 2009 UWB test event in Ispra were also introduced into this report. The Unit later on summarized these activities at a Training Workshop for Project Officers at DG ENTR in Brussels.

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Meeting for collaboration with ETSI
Brussels, 26/10/2009

CORSAs action took part in an exploratory meeting with ETSI to define the way forward for TETRA and Reconfigurable Radio Systems (RRS) in relation to the evolution of Public Safety communications and the related standardisation efforts. Since Public Safety networks based on the TETRA standard are the widest deployed in Europe, a logical solution would be to apply RRS to the evolution of TETRA. Reconfigurable Radio Systems (RRS) are based on technologies such as Software Defined Radio (SDR) and Cognitive Radio (CR). These systems exploit the capabilities of reconfigurable radio and networks for self-adaptation to a dynamically changing environment, with the aim to ensure end-to-end connectivity.

ETSI Meeting on Reconfigurable Radio Systems for Public Safety Communications in Europe. Mainz, 16/12/2009

Reconfigurable Radio Systems are based on technologies such as Software Defined Radio (SDR) and Cognitive Radio (CR). Their aim is to ensure end-to-end connectivity in a communication pathway by self-adaptation to changing network environment. A significant amount of research is being carried out in European Commission-funded collaborative R&D projects in this field with vast impact on public safety applications. The ETSI is now aiming to bridge the gap between research and standardisation with support from JRC. The meeting approved ETSI Technical Report (TR) 102 733 “Systems Aspects” dealing with the design, architecture, security and deployment of RRS technologies in the Public Safety domain. The report describes the use of Dynamic Spectrum Management and Spectrum sharing, security aspects of cognitive radio networks and deployment considerations. IPSCs CORSAs action has been one of the main contributors to this document. The meeting also defined future work items and discussed technical collaboration between commercial and public safety networks for spectrum sharing or spectrum flexibility to be used in case of natural disasters.

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European Communications Office SEAMCAT Workshop
Copenhagen, 2/12/2009

SEAMCAT (Spectrum Engineering Advanced Monte Carlo Analysis Tool) is a software tool based on the Monte-Carlo simulation method, which was developed by the Electronic Communications Committee (ECC) of the European Conference of Postal and Telecommunication administrations (CEPT). This tool permits statistical modelling of different radio interference scenarios for performing sharing and compatibility studies between radio communications systems in the same or adjacent frequency bands. It is foreseen to use SEAMCAT for radio interference simulations and to extend its functionality to Short Range Devices (SRD’s) in the frame of the proposed PHYReLab project which the JRC participates in.

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Paper presented at the Winter Simulation Conference (WSC2009)
Austin Texas, 13-16 December 2009

Pravir Chawdhry presented a paper entitled “Risk Modeling and Simulation of Airport Passenger Departures Process”, to WSC2009. The paper presents a process based approach to modeling and simulation of airport security. The proposed approach would allow decision makers to identify weakest links in a security chain; to assess quantitatively the impact of deploying specific security technologies on the overall process security; and to help choose the optimum technical solutions to achieve the security goals for a given process in an operational environment.

Visit to Sarnoff Corp.
Princeton NJ, USA, 18/12/2009

CORSAs visit to Sarnoff Corp., previously known as RCA Laboratories to look at some of the state of the art security technologies for surveillance, identification and navigation. Sarnoff’s unique Iris-on-the-move (TM) technology has great deployment potential in border security especially in the light of the next generation European ePassport with iris biometrics. The portal implementation of this technology was demonstrated and its possible evaluation was discussed in the context of eGates in European border control. The evaluation of this portal to include multimodal biometrics involving face recognition as well as iris was also discussed.

Sarnoff has several products for public safety applications. These are based on ad hoc wireless sensor networks enabling communications capabilities in GPS-denied urban and subterranean environments. One demonstration was received of radio handsets and deployable relay repeaters based on an off the shelf PDA platform enhanced with radio transceivers. Another product for GPS-denied navigation provides absolute and relative location, positioning, navigation and mapping capabilities in underground environment. In area surveillance, an UWB based system offers a modular security architecture with multiple sensors and ad hoc networking. The specific technology, although not unique, is export restricted.

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The conference was organized by University of Pisa, with the Association for Computing Machinery (ACM) as technical sponsor. VALUETOOLS, now in its fourth edition, has established itself as an interdisciplinary forum for scientists working in the different fields of performance evaluation in academia and industry. Dr Arienzo gave an invited keynote speech at the workshop WSNPerf (Performance Methodologies and Tools for Wireless Sensor Networks) entitled: “Energy-Efficient Distributed Signal Processing in Mobile Wireless Sensor Networks”. The talk dealt with a novel trade-off between the accuracy of the estimation bound and the energy consumption of tracking algorithms.

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CorSA represented JRC at a 3 day French language academic workshop on the subject of Wireless Security supported by the new Agence Nationale de la Sécurité des Systèmes d’Information. The workshop presented security challenges and solutions in Ad-Hoc networks, 802.11 WiFi, GSM, RFID, NFC, sensor networks, privacy and gelocationalisation, SCADA telemetry over RF and Critical Networked Infrastructure. It was mentioned that the GSM A5/1 and A5/2 encryption algorithms are likely compromised, currently the 3G system has no known attacks however the Electronic Attack threat to infrastructure in general is increasing.

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EULER Project Workshop
Paris, 20/10/2009

CorSA participated in the FP7/EULER project workshop. JRC involvement in the project is mainly in two areas. As WP2 leader, it is to define end-users requirements, and in WP4, in the development and testing of software-defined radio (SDR) platforms and waveform evaluation procedures. Technical discussions centered on the installation and porting of common tool chain for developers and communication tools for project partners.

Management discussions of the meeting were mostly on WP risk analysis, clarifications and planning the way forward. The most interesting item is the planning of the 1st joint workshop between WP2 (end-user requirements) - WP8 (dissemination) which is to take place before the annual review scheduled in February 2010.

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Exploratory research project 2009 “Hardening of GNSS tracking devices”

The vessel monitoring system (VMS), a monitoring control and surveillance device, aids fisheries monitoring centers (FMC) helping them to limit illegal, unreported and unregulated (IUU) fishing which is a known problem. This exploratory research project has the aim of finding out how to harden VMS boxes and other GNSS based trackers against tampering, using an approach that addresses each risk of such a device. The collaboration with CorSA is partly conceptual and partly related to signal and cybersecurity, involving as well the unit “Traceability and Vulnerability Assessment” for aspects related to physical sealing mechanisms. The high point in 2009 was the visit of Prof. Humphreys from the University of Texas (UT) at Austin in order to explore vulnerabilities in GPS based trackers.

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Dual-use Satellite/GSM Handset Geolocation Emissions to Detect Non-cooperative Agents - Collaborative project 2010

The aim of this project is to locate the source of radio transmissions in maritime area with the purpose to increase the Maritime Situational Awareness with particular attention to targets not already identified via other means. A specific safety purpose is to shorten the rescuing operations response time in the emergency cases (bad weather conditions, flood), by examining a widely used satellite terminal signals characteristics. Additional specific purposes might also concern security (piracy). The collaboration between STA and Maritime Affairs Units will lead to get an additional autonomous source of data to establish the positions and identity of non-collaborative targets at sea and to leverage the application of the cost/benefits of GNU radio solutions in the safety and security domains.

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Passive Automatic Identification System for Maritime Surveillance
IPSC Exploratory Research Proposal – 2010

Automatic Identification System (AIS) has been recently introduced as self-reporting technique for maritime surveillance. The collaboration proposes an entirely novel exploitation of AIS, representing a low cost solution to augment the information that can be derived from the existing AIS infrastructure. This is achieved by analysing indirect reflections of the broadcast AIS signals. The objective of this study is a first test of feasibility. The proposed Passive-AIS (P-AIS) concept is based on the innovative use of the widespread AIS emissions as illuminators of opportunity.

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