P5 – The Privacy Preserving Perimeter Protection Project

David Lindgren and Ola Friman

The Swedish Defence Research Agency, FOI
581 11, Linköping, Sweden

***Abstract*—The newly started European FP7 project P5 is presented. P5 aims to find new innovative sensor solutions to meet new requirements on surveillance efficiency around critical infrastructures such as power plants, server sites, and telecommunication hubs. This text aims to give an overview of the P5 activities and goals.**

I. Introduction

The pan European FP7 capability project P5 aims to develop new methods for improved protection of critical infrastructures. P5 started in August 2013 with The Swedish Defence Research Agency, FOI, as coordinator. Apart from Sweden, P5 has contributors from five countries; CAST and University of Reading in the UK, IMST in Germany, University of Namur in Belgium, SAGEM in France, and Visual Tools in Spain. In Sweden, also Termisk Systemteknik, and OKG are partners. P5 will run for three years.

II. Project Activities and Goals

P5 is a response to the call *Early warning security systems: physical protection of critical buildings.* The goal of the P5 project is an intelligent perimeter surveillance system that works robustly in a wide range of weather and light conditions and that has strong privacy preserving features. The system will monitor the region outside the security area of critical buildings and infrastructure, and give early warning if terrestrial or airborne threats are detected, see Fig. 1. A low false alarm rate from animals or other innocuous events, combined with high threat detection sensitivity and privacy standards, will be central ambitions of the project. To achieve these goals, a system based on radar, visual and thermal sensors is envisaged. The sensor suite will be complemented with advanced algorithms for sensor fusion, object detection and classification, privacy preservation, and high level modeling of intent and behaviour analysis. The research will be supported by field tests and an integrated demonstrator system is a final project deliverable. In summary, the main research themes include:

- Fusion of the information from the radar, visual and thermal sensors, see [1].
- Sensor integration and adaptive algorithms for background clutter modeling and artifact reduction.
- Detection and classification of objects based on the multi-sensor data.
- Analysis of behaviour and risk assessment.

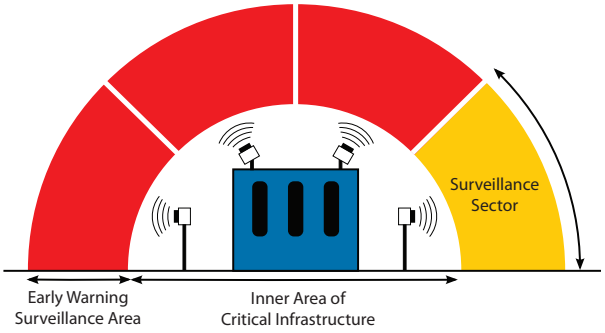

Fig. 1. A model picture of a bubble spanning over the CI. The P5 system monitors the shaded early warning area outside the perimeter of the infrastructure area using a sensor network, where each sensor node covers a surveillance sector.

- Algorithms and methods for preserving privacy.
- Human factors and system design.
- Legal, ethical and sociological aspects of the surveillance system.

OKG, who runs the nuclear power plant outside Oskarshamn is a partner and stakeholder in P5, and one of the final demonstrations will be conducted with a relevant scenario at the OKG facilities. Other stakeholders in the project include The Belgian Ministry of Justice, The UK Security Information Technology Consortium, and SKB, The Swedish Nuclear Fuel and Waste Management Company.

Surveillance over extended areas around the critical infrastructures makes it important to consider both legal and ethical aspects. A special work package in the project is devoted to the studies of how new extended sensor capabilities can be achieved in a fashion that preserves privacy. The project also consults an independent and international board of ethical experts.

A vision in P5 is that the new methods developed will contribute to better security of the citizens without compromising privacy, and also that new innovative sensor solutions results that strengthen the competitiveness of European enterprises.

References

[1] Y.-K. Xu and X.-G. Liang, "Information fusion for radar/infrared compound seeker based on federated filter," *International Journal of Digital Content Technology and its Applications*, vol. 5, pp. 218–229, 2011.