

PLASMA – a high-performing and open platform for the integration of heterogeneous sensor networks

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Abstract

The use of sensors to capture disparate types of information from the environment has been increasing and they cover a wide range of applications, such as climate monitoring (e.g., seismic activity and climate), water quality monitoring, area surveillance, intelligent buildings, energy management, automotive industry and scientific purposes. Additionally, the Information Age has provided rapid and ubiquitous access to information produced by heterogeneous sources. Thus, the development of sensor networks has emerged as a way to exploit the Information Age capabilities into sensor applications. A major outcome of this combination is the capability to remotely receive and process sensor data (covering large areas) in real-time therefore allowing the development of new studies and algorithms aiming at anticipating and predicting (with high-reliability) events, such as storms (already state-of-the-art) and earthquakes (not yet possible).

The developments in the scientific and industry communities were proficient in creating a large number of sensor networks that, nonetheless, (i) were designed to fit specific needs, (ii) were usually deployed in closed networks (not accessible to external parties), and/or (iii) do not interoperate with each-other, thus not leveraging possible synergistic effects of combining multiple sensor networks. To solve these issues, we initiated the project PLASMA.

Project PLASMA is a project aiming at creating a technological platform that integrates heterogeneous sensor networks, in an open, automatic, almost unobtrusive and scalable way, presenting high performance levels. Having research, development, experimentation and the integration of new and existing hardware and software sensors and sensors networks as its main pillars, Project PLASMA is built with the following main components:

- 1) R&D of reliable and robust node-to-node communication systems, over open and complex networks, such as the internet. The system will support a high number of nodes (100+), which may belong to different and independent sub-networks.
- 2) R&D of efficient and reliable information dissemination systems (close to real time performance) between and amongst the nodes that constitute the network in a highly dynamic environment.
- 3) Integration of existing sensors and network sensors into PLASMA, in order to capitalise in all investments and systems already in operation.

Project PLASMA itself is a synergistic effort resulting from the combination of the know-how and expertise of scientific, engineering and business (i.e., financial sustainability) disciplines, applied by the University of Évora (via two Research Labs) and WE ARE IT (a start-up SME). It also comprises the goals of (i) capitalization of the multidisciplinary competences of all consortium entities, (ii) creation and consolidation of long-lasting synergies amongst partners, (iii) creation of critical mass in terms of know-how, competences and technologies used in PLASMA (iv) enabling of internationalisation and participation in European community programmes (FP7) and (v) in the mid-term, the attainment of a sustainable business model.

References

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