



ARGO Sentinel: an application for reporting oil spills at sea

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Within the European research project Argomarine (FP7-SST-2008-RTD-1-234096 “Argomarine-Automatic Oil-spill and geopositioning integrated in a marine information system”) [1], coordinated by the Park Authority of the Tuscan Archipelago, the Signals and Images Laboratory (SI-LAB) of the Institute of Information Science and Technology of the National Research Council of Pisa has developed a Marine Information System (MIS) to detect, monitor and manage marine pollution events, ranging from major accidents to micro oil spillages.

The MIS was conceived as a connected group of subsystems for performing data storage, decision-support, data mining and analysis over data warehouses, as well as a web-GIS portal for easy access and usage of products and services released to end-users.

The main task of the MIS is to serve as a shell to integrating data, information and knowledge from various sources pertained to the marine areas of interest, by means of adequate Information Technology tools. An integrant part of the MIS is represented by the data that can be collected and shared by volunteers who want to collaborate in monitoring the status of the sea.

For this purpose, we have developed ARGO Sentinel [2], a free application for smartphones with a Geolocation System (GPS). Two versions of the app have been implemented: an HTML5 version, running as an Opera widget, distributed only to the partners of the project, and a native Android (v2.2 or higher) publicly distributed because of its level of stability, and downloadable by anyone from Google Play.

ARGO Sentinel was conceived on the intuition that the contribution of volunteers could play a fundamental role in monitoring and protecting the environment. Indeed, by using the app, whenever someone at sea sights signs of oil or hydrocarbon pollution they can immediately report this to the SI-LAB in Pisa. The information is recorded in the MIS and complements the data obtained from more traditional sources (eg remote sensing, sensorized buoys, AUVs...), improving the quality and coverage of marine monitoring, especially in protected areas. In this way we can build up a detailed map of the status of our seas.

The app has been installed by about 800 individuals all over the world. By integrating the alerts sent by the volunteers with all the other information sources collected in the MIS, a semi-automatic analysis eliminated the alerts identified as false positive. In addition, on the basis of the collected data, the MIS is capable of computing a real time dynamic map with estimated level of risk. The map draws the

attention of the authorities to the particular areas where risky conditions are detected in order to foster a more accurate monitoring. Proactive alerting services can be built on top of the dynamic risk map for issuing automatic warning messages.

Our field tests demonstrate that the use of this new technology could be really important in combating pollution. Our experience suggests that this kind of technology can be applied to many other fields where environmental monitoring and safety is crucial.

References:

[1] Argomarine Project: <http://www.argomarine.eu>

[2] ARGO Sentinel: <http://tinyurl.com/argosentinel>
