

Cloud2IR: Infrared thermography and environmental sensors integrated in an autonomoussystem for long term monitoring of structures

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Since late 2014, the project Cloud2SM aims to develop a robust information system able to assess the long term monitoring of civil engineering structures as well as interfacing various sensors and data. Cloud2SM address three main goals, the management of distributed data and sensors network, the asynchronous processing of the data through network and the local management of the sensors themselves [1].

Integrated to this project Cloud2IR is an autonomous sensor system dedicated to the long term monitoring of infrastructures. Past experimentations have shown the need as well as usefulness of such system [2]. Before Cloud2IR an initially laboratory oriented system was used, which implied heavy operating system to be used [3]. Based on such system Cloud2IR has benefited of the experimental knowledge acquired to redefine a lighter architecture based on generics standards, more appropriated to autonomous operations on field and which can be later included in a wide distributed architecture such as Cloud2SM. The sensor system can be divided in two parts.

The sensor side, this part is mainly composed by the various sensors drivers themselves as the infrared camera, the weather station or the pyranometers and their different fixed configurations. In our case, as infrared camera are slightly different than other kind of sensors, the system implement in addition an RTSP server which can be used to set up the FOV as well as other measurement parameter considerations.

The second part can be seen as the data side, which is common to all sensors. It instantiate through a generic interface all the sensors and control the data access loop (not the requesting). This side of the system is weakly coupled (see data coupling) with the sensor side. It can be seen as a general framework able to aggregate any sensor data, type or size and automatically encapsulate them in various generic data format as HDF5 or cloud data as OGC SWE standard. This whole part is also responsible of the acquisition scenario the local storage management and the network management through SFTP or SOAP for the OGC frame. The data side only need an XML configuration file and if a configuration change occurs in time the system is automatically restarted with the new value.

Cloud2IR has been deployed on field since several Monthat the SenseCity outdoor test bed in Marne La Vallée (France)[4]. The next step will be the full standardisation of the system and possibly the full separation between the sensor side and the data side which can be seen at term as an external framework.

References:

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