Welcome Message

During recent years, the importance and potential of Wireless Sensor Networks (WSNs) have been demonstrated in many application areas, such as emergency services, environment protection, body area networks for healthcare, and logistics, to name a few. WSNs are increasingly being integrated in larger computing infrastructures, e.g., by providing the link to the physical world in Internet of Things scenarios and by offering distributed sensing and actuation in Cyber-Physical Systems.

WSNs are composed of tiny devices that are inherently resource constrained. Their lifetime depends on the capacity of their batteries and their energy consumption. Memory is scarce and processing power limited. Communication between the nodes is typically unreliable and consumes a major part of the energy. Furthermore, WSN applications must run unattended and therefore self-organize.

As a result, WSN developers must address not only functional application requirements but also a number of challenging, non-functional requirements and constraints. In addition, the heterogeneity of network nodes, the unpredictable environmental influences, the large size of the network, and the need to integrate with back-end computing infrastructures further add to the difficulties.

These aspects make the development of WSN software a challenging and cumbersome task in which multiple objectives need to be pursued at the same time. Surveys indicate that these challenges often lead to failures of field deployments because the needed supporting software development methodologies and tools are lacking. Creation of software engineering support is therefore essential, not only to ease the development task but also to make it more reliable, dependable, and repeatable. The lack of proper tools and software development methodologies undermines the confidence in functional correctness, dependability, and performance of the resulting software. To better reach these goals, the SESENA workshop promotes increased attention of the Software Engineering (SE) community to these unique challenges of WSNs.

In the WSN community, there is a growing awareness about the need for principled, software engineering (SE) approaches to the development of WSN software. The development problem is increasingly exacerbated by the need to integrate WSNs in larger computing infrastructures. Therefore, the aim of the SESENA workshop was to bring together researchers from both the SE and WSN communities to jointly address the above-mentioned challenges. A synergy between the SE and WSN fields could progress both fields: by providing WSNs with the software development techniques currently missing and by providing SE with an opportunity to face new challenges or re-address old problems in a new context. The two research communities were long oblivious to each other; while previous editions of the SESENA workshop have successfully brought the communities into a shared venue, the previously described challenges still remain. This fourth edition of SESENA also aimed at fostering lively and fruitful discussions among members of these two communities, at identifying shared goals and research agendas, and at devising future joint research projects.

SESENA 2013, the fourth in a series of workshops devoted to software engineering for sensor network applications, took place in San Francisco (USA) on May 21, 2013, in conjunction with the 35th ACM/IEEE International Conference on Software Engineering (ICSE). SESENA 2013 built on the success of the previous three versions of the workshop; the first was held at ICSE 2010 in Capetown, South Africa, the second with ICSE 2011 in Honolulu, Hawaii, and the third with ICSE 2012 in Zurich, Switzerland.

From a broad number of submissions, we selected nine papers for presentation at the technical sessions. Each paper was reviewed by at least three members of a very diverse program committee, which included representation from both communities and from around the world. The focus of the selection process was on providing a blend of full-fledged research contributions and preliminary results that could foster lively discussions. SESENA 2013 also included two keynote presentations, one given by Mary Lou Soffa of The University of Virginia and one given by Phil Levis of Stanford University. The former came from the SE direction and addressed WSN concerns, and the latter came from the WSN direction and addressed SE concerns. Finally, to further promote lively discussion, these research presentations and keynotes were accompanied by a special “speaker’s corner” session with very short impromptu presentations by attendees, regardless of whether they were authors of accepted papers.

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