

## **SDCF – A Sensor Data Collection Framework for Social and Ubiquitous Environments: Challenges and First Experiences in Sensor-based Social Networks\***

Martin Atzmueller and Katy Hilgenberg

### **Abstract**

Sensor-based social networks usually emerge from mobile or pervasive applications. In this way, ubiquitous social systems help to bridge the gap between physical and online worlds utilizing context awareness, pervasive computing and sensor networks. Mobile and ubiquitous devices, such as smartphones or RFID tags, coupled with appropriate social applications enable an integrated approach for both physical and digital social interactions. The core of such applications involves an effective data collection. There is a variety of social networks which can be created using co-location and contact information in a mobile setting, that is, social networks enabled by sensors and mobile devices, as well as ephemeral networks created "spontaneously" during certain events. Typically sensor information is utilized to enrich social network data with valuable context information. In this paper, we provide an overview on the Sensor Data Collection Framework (SDCF [1]) - a flexible and highly configurable framework to collect various physical and virtual sensor data on mobile Android devices (<http://www.sdcf.eu>). After that, we discuss challenges in sensor-based social networking, e.g., [2,3]. Finally, we report first experiences with the framework and the collected interaction data in a collaborative workgroup context, and outline interesting directions for data analytics, cf. [4-6].

### **References**

- [1] Atzmueller M, Hilgenberg K (2013) Towards Capturing Social Interactions with SDCF: An Extensible Framework for Mobile Sensing and Ubiquitous Data Collection. Proc. 4th International Workshop on Modeling Social Media (MSM), Hypertext 2013, ACM Press, New York, NY, USA
- [2] Atzmueller M (2014) Data Mining on Social Interaction Networks. JDMDH, 1
- [3] Atzmueller M, Becker M, Kibanov M, Scholz C, Doerfel S, Hotho A, Macek BE, Mitzlaff F, Mueller J, Stumme G (2014) Ubicon and its Applications for Ubiquitous Social Computing. New Review of Hypermedia and Multimedia, (20)1
- [4] Atzmueller M (2015) Subgroup Discovery. WIREs: Data Mining and Knowledge Discovery, 5(1)
- [5] Atzmueller M, Puppe F (2008) A Case-Based Approach for Characterization and Analysis of Subgroup Patterns. Journal of Applied Intelligence, 28(3)
- [6] Atzmueller M, Roth-Berghofer T (2011) The Mining and Analysis Continuum of Explaining Uncovered. In: Research and Development in Intelligent Systems XXVII, pp. 273–278. Springer, Berlin
- [7] Scholz C, Doerfel S, Atzmueller M, Hotho A, Stumme G (2011) Resource-Aware On-Line RFID Localization Using Proximity Data. In Proc. ECML/PKDD, pp. 129-144, Springer

\*This extended abstract summarizes and extends the paper [1].