Ambient-oriented Programming in AmbientTalk

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Software development for mobile devices (such as smart phones and PDAs) is given a new impetus with the advent of mobile networks. Mobile networks surround a mobile device equipped with wireless technology and are demarcated dynamically as users move about. Mobile networks turn the applications running on mobile devices from mere isolated programs into smart applications that can cooperate with their environment. As such, mobile networks take us one step closer to the world of ubiquitous computing envisioned by Weiser; a world where (wireless) technology is gracefully integrated into the everyday lives of its users.

Mobile networks that surround a device have several properties that distinguish them from other types of networks. The most important ones are that connections are volatile (because the communication range of the wireless technology is limited) and that the network is open (because devices can appear and disappear unheraldedly). This puts extra burden on software developers. Although low-level system software and networking libraries providing uniform interfaces to these wireless technologies (such as JXTA and M2MI) have matured in the last couple of years, developing application software for mobile networks still remains difficult. One of the main reasons for this is that current-day programming languages lack abstractions that deal with the mobile hardware characteristics. This observation justifies the need for a new Ambient-Oriented Programming paradigm (AmOP for short) that consists of programming languages that explicitly incorporate potential network failures in the very heart of their basic computational steps.

The demo showcases AmbientTalk, a first scion of this AmOP programming language family and is conceived as an alteration between:

– showing code snippets that illustrate the simplicity and expressive power of AmbientTalk. Meanwhile participants can become acquainted with AmbientTalks concurrent object model, as well as its system of first-class mailboxes to deal with the mobile hardware characteristics.
– demonstrating how these programs actually behave in a real-life context. This will be done by showing the execution of the programs on several portable devices such as Laptops and smart phones.