

Active Smart u-Things and Cyber Individuals

Jianhua Ma,

Laboratory of Multimedia Ubiquitous Smart Environment,
Department of Digital Media,
Faculty of Computer and Information Sciences,
Hosei University, Tokyo 184-8584, Japan
jianhua@hosei.ac.jp

Abstract. Due to the continuing miniaturization of chips and availability of wired/wireless communications, many kinds/forms of devices can be integrated into physical objects and ambient environments. The u-things, as opposed to pure digital e-things existing on computers/Web/Internet, are ordinary physical things with attached, embedded or blended computers, networks, and/or some other devices such as sensors, actors, e-tags and so on. Active smart u-things are ones that can, more or less, sense, compute, communicate, and may take some actions according to their goals, situated contexts, users' needs, etc. Active smart u-things can be with different levels of intelligence from low to high, and in various intelligent forms, e.g., aware, context-aware, interactive, reactive, proactive, assistive, adaptive, automated, autonomic, sentient, perceptual, organic, life-like, cognitive, thinking, etc. Active smart u-things may cover innumerable types of physical things in the real world. They can be roughly classified into three categories, i.e., smart object, smart space and smart system, according to their appearances and functions. The grand challenge is how to enable these smart u-things to offer desired services to all people in right time, right place and right means with ubisafe guarantee. Furthermore, the essential and existence of human in cyber-physical combined spaces should be re-examined. The Cyber Individual, with a short term 'Cyber-I', is a real individual's counterpart in cyberspace. Cyber-I can be seen as a comprehensive description of a real individual including one's physical status, physiological states, psychological behaviors, personal features, social relations, history experiences, etc. Such kind of individual description and modeling is fundamental to offer personalized services to different users according to their needs and situations.

Keywords: u-thing, sensor, actuator, tag, robot, smart object, space and system, ubiquitous intelligence, cyberspace, cyber individual, user modeling.