Chapter 5

Ubiquitous Computing: Any Ethical Implications?

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ABSTRACT

In this article, the authors investigate, from an interdisciplinary perspective, possible ethical implications of the presence of ubiquitous computing systems in human perception/action. The term ubiquitous computing is used to characterize information-processing capacity from computers that are available everywhere and all the time, integrated into everyday objects and activities. The contrast in approach to aspects of ubiquitous computing between traditional considerations of ethical issues and the Ecological Philosophy view concerning its possible consequences in the context of perception/action are the underlying themes of this paper. The focus is on an analysis of how the generalized dissemination of microprocessors in embedded systems, commanded by a ubiquitous computing system, can affect the behaviour of people considered as embodied embedded agents.

INTRODUCTION

The generalized dissemination of sensors, cameras and other technological tools, used by ubiquitous computing systems, has introduced a new aspect into human perception and action. Thus, for example, the presence of cameras on roads and in airports immediately induces an awareness of the speed of the vehicle or the checking of illicit objects in our suitcases. Are these unusual cases of induced behaviour that could change our patterns of perception/action? This kind of question is investigated in an emergent research area known as technoethics.
Technoethics is an interdisciplinary field of investigation concerned with ethical aspects of technology. Since the 1970’s, after Mario Bunge introduced the term technoethics in his article Towards a Technoethics, there have been several characterizations of this area (Bunge, 1977; Galvan, 2003; Lupiccini, 2008) focusing on ethical issues related to the possible consequences of technological development on human society and the environment. For the present article, Lupiccini’s (2008) definition of technoethics is of special relevance:

Technoethics is defined as an interdisciplinary field concerned with all ethical aspects of technology within a society shaped by technology. It deals with human processes and practices connected to technology which are embedded within social, political, and moral spheres of life. It also examines social policies and interventions occurring in response to issues generated by technology development and use. (p. 4)

The above definition, in common with the majority of other available definitions, expresses aspects of an interdisciplinary field concerned with the analysis of problems related to rapid technological development, during which new tools have been incorporated into human social life, bringing about previously unknown social behaviour, in a society “shaped by technology”.

Since it is not possible to establish a necessary parallelism between technological and moral progress, it seems crucial to investigate whether contemporary technical advancements are ethically acceptable. Would new ethical standards be needed in order to evaluate new emergent patterns of social behaviour, or are traditional ethical principles adequate to accomplish such an evaluation? In other words, could technoeconomics help to improve the traditional field of applied ethics? We are only just beginning to investigate possible answers to this type of question formulated in the expansive field of technoeconomics. A central question to be addressed in this article is: What could be the impact of the long-term existence of ubiquitous computing, of which we are not immediately aware, in our everyday life? Possible ethical implications of the presence of ubiquitous computing systems in human perception/action constitute the focus of the present analysis.

The term ubiquitous computing is used here to characterize information-processing capacity from computers that is available everywhere and all the time, integrated into everyday objects and activities.

The dissemination of ubiquitous computing, in which the information-processing power of computers is distributed in countless, intelligent, devices imperceptible to an inattentive observer, is growing apace: small passive tags help to detect the circulation of books and commodities in libraries or convenience stores; intelligent badges can open doors or tollgates, adjust the room temperature of offices, help in the location of people, and operate various electronic devices, amongst other things. Even though information concerning the habits of individuals can normally be accessed on personal computers via manual processes, this information, when widely available, can be used for different purposes, including those which put personal privacy at risk.

In this paper, we examine the question of how the generalized dissemination of microprocessors in embedded devices, controlled by a ubiquitous computing system, can affect the perception/action of people considered as rational and autonomous agents. Initially, we reflect on aspects of ubiquitous computing from the perspective of traditional ethics. This perspective is then contrasted with the Ecological Philosophical view, concerning possible consequences in the context of perception/action.

**Ubiquitous Computing**

The concept of ubiquitous computing was first coined by Mark Weiser (1991), when he was chief