Chapter XII
The Auto-ID Trajectory

INTRODUCTION

This chapter considers the automatic identification (auto-ID) trajectory within the context of converging disciplines to predict the realm of likely possibilities in the short-term future of the technology. The chapter relies heavily on presenting a cross-section of research conducted primarily up until 2003 when the first commercial chip implant occurred, as a window to forecasting what kinds of technologies may become widely diffused by 2020. After showing the evolutionary development from first generation to third generation wearable computing, medical breakthroughs using implantable devices are documented. The findings of the chapter suggest that before too long, implantable devices will become commonplace for control, convenience and care-related applications. The paradigm shift is exemplified in the use of auto-ID, from its original purpose in identifying humans and objects to its ultimate trajectory with multifunctional capabilities buried within the body.

THE RISE OF WEARABLE COMPUTING

According to Siewiorek (1999, p. 82) the first wearable device was prototyped in 1961 at MIT (Massachusetts Institute of Technology) by Edward Thorp and Claude Shannon. The idea for the device came in 1955 in an attempt to be able to predict roulette. However, the term "wearable computer" was first used by a research group at Carnegie Mellon University in 1991, coinciding with the rise of the laptop computer (early models of which were known as "luggables"). Wearable computing can be defined as: "anything that can be put on and adds to the user's awareness of his or her environment… mostly this means wearing electronics which have some computational power" (Sydänheimo et al., 1999, p. 2012). While the term "wearables" is generally used to describe wearable displays and custom computers in the form of necklaces, tie-pins and eyeglasses, it is the opinion of the researchers that the definition should be broadened to incorporate PDAs (personal digital assistants), e-wallets, and other mobile accessories such as cellular phones and smart cards that require the use of belt buckles or satchels attached to conventional clothing.

Before the widespread diffusion of personal computers (PCs) and laptops it was auto-ID devices in the form of bar code cards, magnetic-stripe cards and smart cards that were 'luggable' and to some degree

Copyright © 2009, IGI Global, distributing in print or electronic forms without written permission of IGI Global is prohibited.

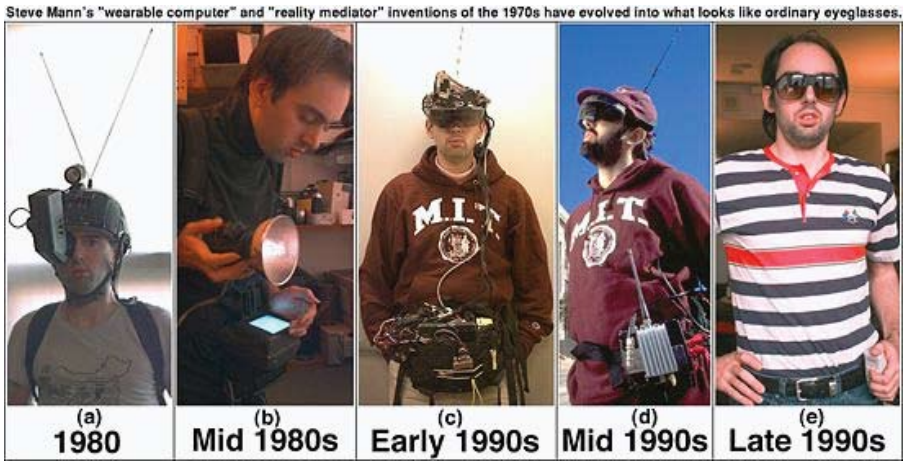
wearable with the aid of an external clip or fastener. In the case of contactless smart cards they could even be carried in a wallet or purse or in a trouser or shirt pocket. While they did not have the same processing power as PCs or laptops, auto-ID devices did point to a practical ideal, in terms of their size. IBM and other computer manufacturers have quickly caught onto the notion of wearable computing- their vision of a portable computer that could be worn instead of carried has been well-documented. According to Phil Hester of IBM's Personal Systems Group, the wearable PC, a hybrid device, would allow a user to freely walk around a building connected to a wireless network and perform all the day-to-day functions like send emails but with the added option of voice navigation/recognition (Wilcox, 1999, p. 1).

Wearable computing is about to reinvent the way we work and go about our day-to-day business, just like auto-ID devices did in the 1970s and 1980s. It is predicted that highly mobile professionals will soon take advantage of smart devices that will be built into their clothing so that they will be able to "…check messages, finish a presentation, or browse the Web while sitting on the subway or waiting in line at a bank" (Schiele et al., 2001, p. 44). And not just professionals but society at large is taking advantage of the latest gadgetry. MIT's "Group-Media" are creating socially intelligent wearables for the following projects: The Jerk-O-Meter, MoodPhones / VibePhones, Elevator Rater, Human Interest-Meter, Speed Dating v2, Negotiations, and Movie Audience Reactions (Pentland, 2009).

1G WEARABLES: MOBILE DEVICES, PDAS AND PAGERS

Early prototypes of wearable computers throughout the 1980s and 1990s could have been described as outlandish, bizarre, abnormal-looking or even weird. For the greater part, wearable computing efforts have focused on head-mounted displays (a visual approach) that unnaturally interfered with human vision and made proximity to others cumbersome (Sawhney & Schmandt, 1997, p. 171). But the long-term aim of research groups is to make wearable computing inconspicuous as soon as technical improvements allow for it (Figures 1 and 2). The end user should look as 'normal' as possible (Mann, 1997, p. 177). One need only consider the size of the first mobile phones in the early 1990s; they weighed the size of a small

Figure 1. Self-portraits of Mann with wearable-computing gear from the 1980s to the 1990s. Professor Mann started working on his WearComp invention as far back as his high school days in the 1970s. Courtesy of Professor Steve Mann.



33 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/auto-trajectory/23822

Related Content

Energy Efficient Congestion Control in Wireless Sensor Networks
Awais Ahmad, Anand Paul, Sohail Jabbarand Seungmin Rho (2020). *Sensor Technology: Concepts, Methodologies, Tools, and Applications (pp. 780-799).*
www.irma-international.org/chapter/energy-efficient-congestion-control-in-wireless-sensor-networks/249591

A Review on Conservation of Energy in Wireless Sensor Networks
Oluwadara J. Odeyinka, Opeyemi A. Ajibola, Michael C. Ndinechi, Onyebuchi C. Nosiriand Nnaemeka Chiemezie Onuekwusi (2020). *International Journal of Smart Sensor Technologies and Applications (pp. 1-16).*
www.irma-international.org/article/a-review-on-conservation-of-energy-in-wireless-sensor-networks/281600

Wireless Sensor Network Enabled Vehicle Parking System
Madhuri Raoand Narendra Kumar Kamila (2020). *Sensor Technology: Concepts, Methodologies, Tools, and Applications (pp. 895-916).*
www.irma-international.org/chapter/wireless-sensor-network-enabled-vehicle-parking-system/249598

Reinstate Authentication of Nodes in Sensor Network
Ambika N. (2020). *Sensor Network Methodologies for Smart Applications (pp. 130-147).*
www.irma-international.org/chapter/reinstate-authentication-of-nodes-in-sensor-network/256035

Adaptive Sensor Aggregation With Self-Monitoring: A Rust-Based Concurrent Data Pipeline
Ruiman Huang, Shuxin Jia, Zeyu Min, Haoyue Zhangand Hewa Majeed Zangana (2026). *Advanced Concurrency, Buffering, and Web-Sync in Sensor Platforms: Zero-Loss Streams (pp. 131-162).*
www.irma-international.org/chapter/adaptive-sensor-aggregation-with-self-monitoring/411995