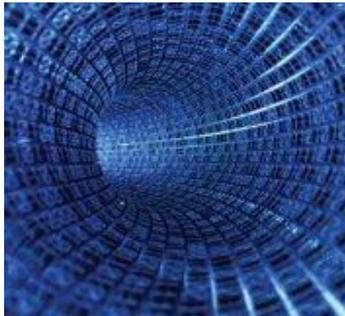


## From computers to ubiquitous computing, by 2020

Compiled and edited by Marta Kwiatkowska, Tom Rodden and Vladimiro Sassone

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Ubiquitous computing, pioneered by Mark Weiser in 1988, postulates that computing devices will become 'invisible'.

We are already witnessing a huge increase in the numbers of miniature computing devices - almost imperceptible, but often globally connected and everywhere around us - embedded in smart buildings, vehicles, environment, clothing and even implanted in the human body. They are used to control processes, monitor the environment and our health, communicate with others, in learning, fun, business and intellectual endeavour, at home or during travel. The ubiquitous computing scenario raises many engineering, design, usability, scientific, business and ethical challenges. How can we power the on-body sensors, coordinate their action, analyse the transmitted data stream, and predict the risk of a heart attack quickly and accurately? What implications arise from falsely identifying the risk of heart failure, or from overhearing a financial transaction?

To answer these questions requires inter-disciplinary expertise from electronic engineering, communications, computer science, artificial intelligence, statistics, psychology, ethics, social sciences and medicine. Three facets, all demanding collaboration between different disciplines, can be identified within the challenge posed by ubiquitous computing: experience, design and science. This volume aims to introduce key scientific and technological issues in ubiquitous computing and raise awareness of opportunities and risks in its wide-spread adoption.

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