



mobile communications series

Robin Mannings



**UBIQUITOUS
POSITIONING**

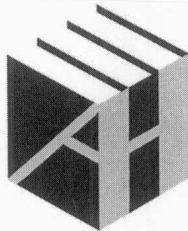
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Robin Mannings



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*To my wife, Diana
and children, Frances, and Peter*

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Chapter 1

Introduction

1.1 The Concept of Ubiquitous Positioning

This book is concerned with knowing accurately the position of things and people everywhere and what then follows from such knowledge. It is a common requirement in many areas of business and social activity and is being made easier by many recent advances in radio, computing, and the Internet. Many drivers now have satellite navigation units (or sat-nav) in their vehicles to avoid getting lost. People at work or at home are now using the Web to view maps and aerial photographs for all sorts of reasons. Geography and navigation of the outdoors has never been so accessible, but there are, however, many unmet needs, particularly if we are interested in inside the built environments and about how things change with time.

The current geographical aspects of the Web, sometimes referred to as the Geoweb, are largely static but in the real world where people and objects are often moving, we may need to consider real-time positional information. For example, when we look at a map we usually see a two-dimensional graphical representation but progress is being made in computerized 3D visualizations of streets and buildings. Since the real world has three dimensions of space, it is desirable to make more advanced graphics to use perspective and render the 2D map as a 3D view so people do not need to learn how to read maps. If changes with respect to time need to be included within a visualization, then we are really using a four-dimensional map that could show where specific vehicles, people, animals, or anything else that is important are situated in real time, within a scene that looks realistic. To deliver this sort of experience, it is necessary to use a wide variety of sensing technologies to detect where everything is, and how it is moving. Communications technology is then needed to deliver the information to those who need to use it, and behind the scenes, clever machine intelligence to automate