Chapter 1

A Short Story About the Development of Computer Science or Why Computer Science Is Not a Computer Driving Licence

1.1 What Do We Discover Here?

The goal of this chapter differs from the following chapters that each are devoted to a specific technical topic. Here, we aim to tell the story of the foundation of computer science as an autonomous research discipline in an understandable and entertaining way. Trying to achieve this goal, we provide some impressions about the way in which sciences develop and what the fundamental building blocks of computer sciences look like. In this way we get to know...
some of the goals of the basic research in computer science as well as a part of its overlap with other research disciplines. We also use this chapter to introduce all ten subjects of the following chapters in the context of the development of computer science.

1.2 Does the Building of Science Sit on Unsteady Fundamentals?

To present scientific disciplines as collections of discoveries and research results gives a false impression. It is even more misleading to understand science merely in terms of its applications in everyday life. What would the description of physics look like if it was written in terms of the commercial products made possible by applying physical laws? Almost everything created by people—from buildings to household equipment and electronic devices—is based on knowledge of physical laws. However, nobody mistakes the manufacturer of TVs or of computers or even users of electronic devices for physicists. We clearly distinguish between the basic research in physics and the technical applications in electrical engineering or other technical sciences. With the exception of the computer, the use of specific devices has never been considered a science.

Why does public opinion equate the facility to use specific software packages to computer science? Why is it that in some countries teaching computer science is restricted to imparting ICT skills, i.e., to learning to work with a word processor or to search on the internet? What is the value of such education, when software systems essentially change every year? Is the relative complexity of the computer in comparison with other devices the only reason for this misunderstanding?

Surely, computers are so common that the number of car drivers is comparable to the number of computer users. But why then is driving a car not a subject in secondary schools? Soon, mobile phones will become small, powerful computers. Do we consider