Preface

The design of distributed systems where computing devices (like computers, smartphones, sensors) interact with one another is one of the most challenging problems in computer science. In this book, I have tried to gently introduce the general reader to some of the most fundamental issues and classical results of computer science underlying the design of algorithms for distributed systems, so that the reader can get a feel of the nature of this exciting and interesting field. The book will appeal to the educated layperson and requires no computer-related background at all. I strongly suspect that also most computer-knowledgeable readers will be able to learn something new.

While humans can see and hear each other, computing devices usually communicate by sending messages or reading from and writing to shared memory locations. As a result, it is far more difficult to synchronize interactions between computers than between humans. Based on this observation, fundamental principles that relate to interactions between computing devices that involve concurrency and synchronization are explained throughout the book.

Each chapter deals with a specific topic presented in terms of a story. I have compared the issues that arise when dealing with groups of computing devices to those that arise when a group of people has to share their resources and work as a team in order to solve various problems together. Most chapters can be read in isolation, but there is a logical grouping to the complete set of chapters. The topics covered are not an exhaustive survey of the field of distributed computing, but largely a subjective sampling of its highlights.

One hint about reading this book—do not go too fast, try to read at most one chapter per sitting. Most of the problems presented look deceptively simple at first glance. The only way to understand their tricky nature is by trying to solve them yourself. For that reason, I suggest that, as soon as a problem is posted, you stop reading and try to solve it yourself. Only after you have butted your head against a problem for some time, can you appreciate its beauty. I hope you will enjoy reading the book!

Contact Information: Please feel free to contact me with any criticism or comments which you might have. I would be glad to hear from you! I can be reached by email at `tgadi@idc.ac.il` or by sending hardcopy mail to Prof. Gadi Taubenfeld, The Interdisciplinary Center, P.O.Box 167, Herzliya 46150, Israel.

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