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Exploitation of Fine-Grain Parallelism

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Preface

The driving force for many research efforts is to provide higher performance for applications of computer systems. There are many computer systems architectures promising a high performance potential, chiefly among them parallel architectures. A whole zoo of parallel system architectures has been developed so far and many of those, although of intelligent design did not survive in the market. One of the main reasons for such failures is that the performance potential of such an architecture cannot be used efficiently by a sufficient number of applications.

This book presents methods to solve the problem of bringing the performance potential of parallel architectures to the applications so that the applications can use this potential efficiently. The focus is on parallelism on the instruction-set level which provides a high performance potential for a great variety of applications, not just the quite restricted sets of applications we see for many coarse-grain parallel architectures.

These methods have been developed in course of a project at Siemens Corporate Research and Development Department. A cooperation with the Institute for Computer Science at Munich Technical University was installed to join the forces for the development of corresponding methods and tools. This cooperation was then entered into a national research program at the Technical University, the Sonderforschungsbereich 342 "Methods and Tools for the Usage of Parallel Architectures".

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