Preface

This textbook is intended for use by students of physics, physical chemistry, and theoretical chemistry. The reader is presumed to have a basic knowledge of atomic and quantum physics at the level provided, for example, by the first few chapters in our book *The Physics of Atoms and Quanta*. The student of physics will find here material which should be included in the basic education of every physicist. This book should furthermore allow students to acquire an appreciation of the breadth and variety within the field of molecular physics and its future as a fascinating area of research.

For the student of chemistry, the concepts introduced in this book will provide a theoretical framework for that entire field of study. With the help of these concepts, it is at least in principle possible to reduce the enormous body of empirical chemical knowledge to a few basic principles: those of quantum mechanics. In addition, modern physical methods whose fundamentals are introduced here are becoming increasingly important in chemistry and now represent indispensable tools for the chemist. As examples, we might mention the structural analysis of complex organic compounds, spectroscopic investigation of very rapid reaction processes or, as a practical application, the remote detection of pollutants in the air.

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Solving Project Management Problem with Paralleled Evolutionary Algorithm

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Abstract. In this paper, we focus on software project managers needs for software project planning. Firstly, we briefly introduce the background and current state of Software Project Management Problem (SPMP). The software project management problem mainly includes resources allocation and work packages scheduling. Our goal is to minimize the overall duration of a software project, while satisfying the dependencies between work packages and constraints of resources allocation in the software project. Finding an optimal solution for above-mentioned software project problem is NP-hard. We learn from search based software engineering approach to analyze and solve software project management problem. We implement both sequential and parallel version applications, which are aim to solve the software project management problem. The sequential version application is based on common programming approach using C++ programming language, and the parallel version application is based on GPGPU programming approach using CUDA C++ API. We redesign search based evolutionary algorithm to cater for our purpose of parallel programming on GPU. Finally, we conduct a comparison experiment to verify the parallel evolutionary algorithm does improve computational efficiency and evolutionary algorithm always converge to (nearly) optimal solutions.

Keywords: Software project management, Evolutionary algorithm, Paralleled Optimization Problem

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