YORICK HARDY AND WILLI-HANS STEEB, "CLASSICAL AND QUANTUM COMPUTING WITH C++ AND JAVA SIMULATIONS", BIRKHÄUSER VERLAG, BASEL-BOSTON-BERLIN, 2001

DAN DUMITRESCU

Scientific computing is not numerical analysis, the analysis of algorithms, high performance computing or computer graphics. It consists instead of the combination of all these fields and others to craft solution strategies for applied problems. It is the original application area of computers and remains the most important. From meteorology to plasma physics, environmental protection, nuclear energy, genetic engineering, symbolic computation, network optimization, financial applications and many other fields, scientific applications are larger, more ambitious, more complex, and more necessary. More and more universities introduce a Department of Scientific Computing or a Department of Computational Science. The components of this new department include Applied Mathematics, Theoretical Physics, Computer Science and Electronic Engineering.

Classical and Quantum Computing provides a self-contained, systematic and comprehensive introduction to all the subjects and techniques important in scientific computing. The style and presentation are readily accessible to undergraduates and graduates. A large number of examples, accompanied by complete C++ and Java code wherever possible, cover every topic.

Features and benefits:

- comprehensive coverage of the theory with many examples;
- website with programs and support is given at "http://issc.rau.ac.za" "http://issc.rau.ac.za";
- topics in classical computing include Boolean algebra, gates, circuits, latches, error detection and correction, neural networks, Turing machines, cryptography, genetic algorithms;
- for the first time, genetic expression programming is presented in a textbook topics in quantum computing include mathematical foundations, quantum algorithms, quantum information theory;
- hardware used in quantum computing.

This book serves as a textbook for courses in scientific computing and is also very suitable for self-study. Students, professionals and practitioners in computer science, applied mathematics and physics will benefit from using the book and the included software simulations.

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