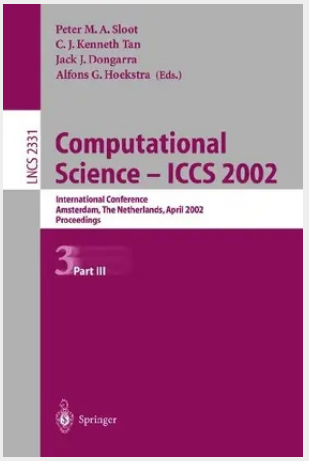
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Computational Science - ICCS 2002

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Computational Science is the scientific discipline that aims at the development and understanding of new computational methods and techniques to model and simulate complex systems. The area of application includes natural systems - such as biology environ mental and geo-sciences, physics, and chemistry - and synthetic systems such as electronics and financial and economic systems. The discipline is a bridge bet ween 'classical' computer science - logic, complexity, architecture, algorithm- mathematics, and the use of computers in the aforementioned areas. The relevance for society stems from the numerous challenges that exist in the various science and engineering disciplines, which can be tackled by advances made in this field. For instance new models and methods to study environmental issues like the quality of air, water, and soil, and weather and climate predictions through simulations, as well as the simulation-supported development of cars, airplanes, and medical and transportsystems etc. Paraphrasing R. Kenway (R.D. Kenway, Contemporary Physics. 1994): 'There is an important message to scientists, politicians, and industrialists: in the future science, the best industrial design and manufacture, the greatest medical progress, and the most accurate environmental monitoring and forecasting will be done by countries that most rapidly exploit the full potential of computational science'. Nowadays we have access to high-end computer architectures and a large range of computing environments, mainly as a consequence of the enormous sti mulus from the various international programs on advanced computing, e.g.

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