Preface

Scientific Visualization is currently a very active and vital area of research, teaching and development. The success of Scientific Visualization is due to the soundness of the basic premise behind it, namely, the basic idea of using computer-generated pictures to gain information and knowledge from data (geometry) and relationships (topology). This is an extremely basic and very important concept which is having profound and widespread impact on the methodology of science and engineering.

The initial planning for this book took place at the Dagstuhl seminar on scientific visualization during June of 1997. The IBFI Schloss Dagstuhl was founded in 1990 and is located in southeast Germany between Saarbuecken and Trier. It offers the opportunity of one-week meetings which bring together the most significant worldwide researchers on topics of importance in information technology. The Dagstuhl seminar on Scientific Visualization was attended by scientists from USA (26), Germany (11), Great Britain (1), The Netherlands (5), France (2), Austria (1), Switzerland (2), Spain (1), Japan (1), Czech Republic (1) and Russia (1).

One of the important themes being nurtured under the aegis of scientific visualization is the utilization of the broad bandwidth of the human sensory system in steering and interpreting complex processes and simulations involving voluminous data sets across diverse scientific disciplines. The interplay between various application areas and their specific problem solving visualization techniques was emphasized in this seminar. Reflecting the heterogeneous structure of scientific visualization, concentration was placed on the topics:

- vector and tensor field visualization
- volume visualization
- interactive steering and exploration
- large data sets and multiresolution techniques

The intent of this book is to present the state of the art in Scientific Visualization techniques, both as an overview for the inquiring scientist, and as a basic foundation for developers. The book contains chapters dedicated to surveys and tutorials of specific topics as well as a great deal of original work not previously published.

Another goal for this book is to provide the basic material for teaching the state of the art techniques in scientific visualization. The extensive bibliographies included with many chapters point out where to obtain further information to complete the course material.

We express our sincere appreciation to the contributing authors and our support staff and hope that this book will serve the visualization community and add to the positive image and reputation of the Dagstuhl seminars.

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