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PROCEEDINGS

OCTOBER 24 – OCTOBER 29, 1999
SAN FRANCISCO, CALIFORNIA
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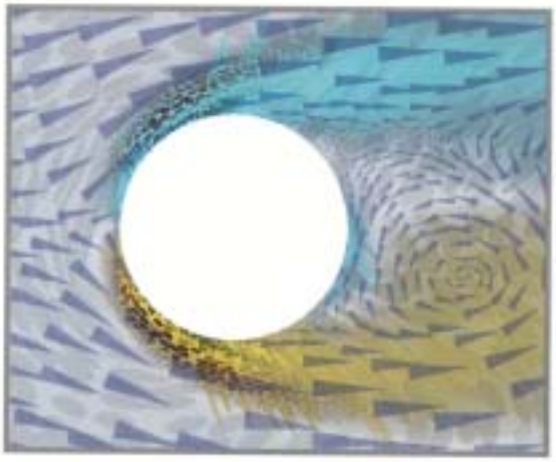

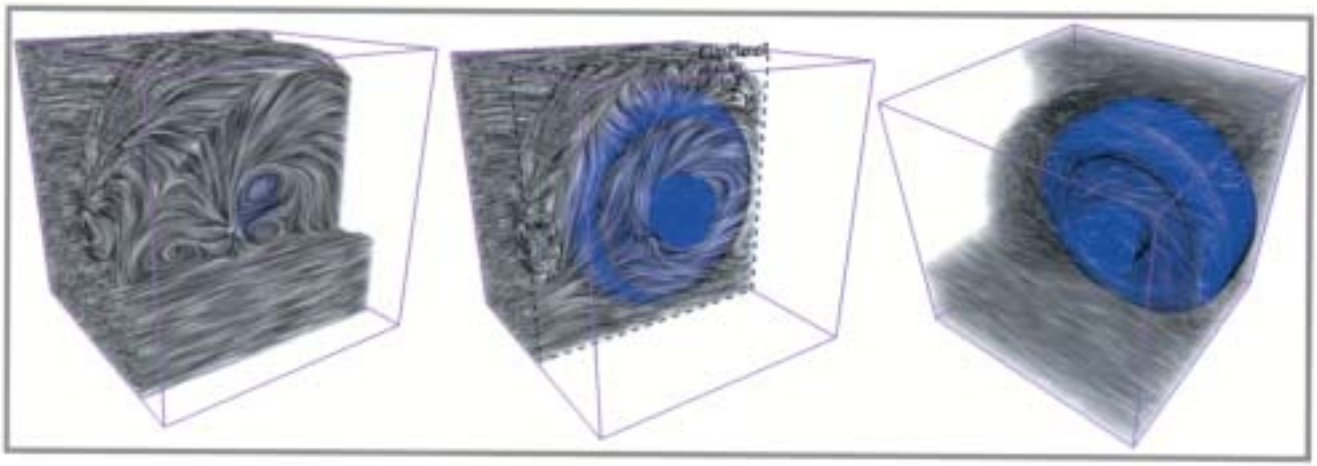

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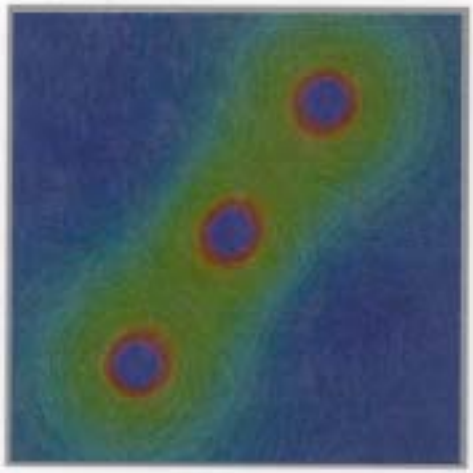

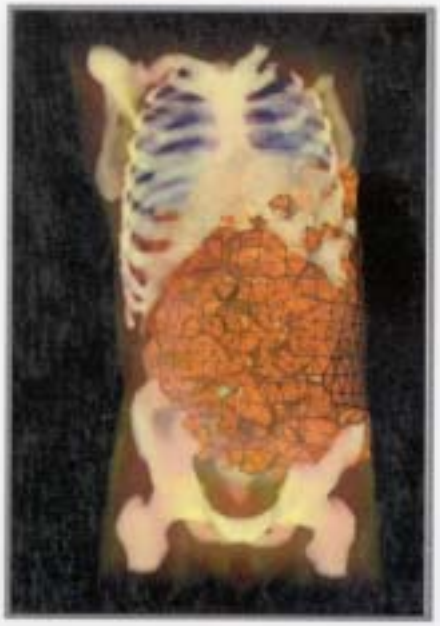

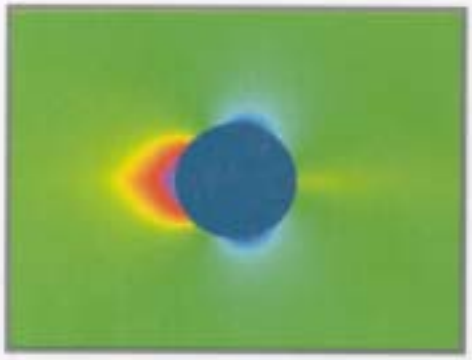

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Preface

We are pleased to welcome you to IEEE Visualization '99, celebrating our ten-year anniversary! This year, the conference is held from October 24 to 29, 1999 in San Francisco, California. Over the past decade, scientific visualization and the Visualization conferences have grown in size, sophistication, and importance. The goal of the Visualization conference is to provide a meeting place for visualization researchers, developers, and users, and to play a defining role for visualization. The conference proceedings have emerged as a major publication venue for innovative visualization research. The annual Visualization conference series is sponsored by the IEEE Computer Society Technical Committee on Computer Graphics in cooperation with ACM SIGGRAPH. The multi-disciplinary nature of the proceedings demonstrates the conference's efforts to foster interaction among developers and users of visualization. With this year's conference program, which includes keynote and capstone events, papers, case studies, and panels, we believe a good mixture of state-of-the-art visualization research and applications is presented.

Keynote Events

This year's keynote speakers are Paul Smith and John Van Rosendale from the U.S. Department of Energy, whose presentation is entitled "Data and Visualization Corridors." The keynote address will focus on the needs of large-scale simulation and visualization.

The capstone speaker is Rick Stevens from the Mathematics and Computer Science Division, Argonne National Laboratory, and the Department of Computer Science, University of Chicago. His presentation is entitled "ActiveSpaces: The Access Grid, Active Mural and Advanced Visualization Systems." This presentation features concepts to step beyond the traditional limitations of workstation screens.

Papers

The heart of this conference is the papers program that provides the core venue for technical information dissemination. To maintain the quality of the review process and keep the high standards of the program, we selected the leading visualization researchers to constitute the Papers Committee, representing the various areas within visualization. Each member of the Papers committee was responsible for reviewing every paper assigned to him/her, and also reviewing and summarizing other reviews written by additional visualization experts for each paper. This process allows a better correlation of individual paper reviews and provides a thorough review of each paper submitted. Even when a paper co-chair appeared as an author on a paper, that paper was reviewed and its acceptance was determined without any input from any person who is an author. In case of a potential conflict of interest for a Papers co-chair or a Papers committee member, the paper was reviewed and its acceptance was determined by alternates. We are indebted to the high-quality, hard work that each member of the Papers Committee has demonstrated to make this review structure a success. The members of this year's Papers Committee were:

David C. Banks
George-Pierre Bonneau
Daniel Cohen-Or
Thomas Ertl
Leila DeFloriani
A. Robin Forrest
Sarah Gibson
Hans Hagen
William Hibbard
Hugues Hoppe
Victoria Interrante
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Robert J. Moorhead
Hans-Georg Pagendarm
Alex Pang
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Holly Rushmeier
Samuel P. Uselton
Amitabh Varshney
William Wright
Roni Yagel

This year, 129 papers were submitted and reviewed by the 21 members of the Papers Committee and 166 additional expert reviewers. The expansion of research in visualization continues, as demonstrated by the increase in the quality of the papers submitted this year. Due to limited time and space, we were able to only accept 47 papers for the final program. These papers cover a wide range of topics, including large-scale data set visualization, mesh compression techniques, feature visualization, metrics characterizing visualization quality, innovative rendering paradigms, isosurfaces, glyph-based visualization, virtual reality, volume rendering, visualization systems, vector and tensor visualization, terrain visualization, and flow visualization. The compilation of this impressive set of high-quality work would not have been possible without the dedication and hard work of the Papers Committee and the other expert reviewers who provided critical evaluations and suggestions for improvements. The Papers Co-Chairs are particularly thankful to Joerg Meyer, UC Davis, who has contributed significantly to the overall reviewing process. This year's expert reviewers were:

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Helen Wright
Roni Yagel
Terry S. Yoo
Ilmi Yoon

Case Studies

The Case Studies are an integral and vital part of the main conference and provides the means for reporting on the use of visualization tools, systems and techniques in a diverse set of applications. It also helps identify new directions for visualization research. This year's program consists of 22 papers from both researchers and practitioners in the areas of medical data visualization, flow visualization, visualization systems, airspace/terrain and sea-bed visualization, volume visualization, and information visualization. The high quality of this unique program is due to the efforts of the Case Study Chairs, Kwan-Liu Ma, UC Davis, and David Kao, NASA Ames, and these 48 reviewers:

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Barry Becker
R. Daniel Bergeron
Ken W. Brodlie
Brian Cabral
Tom Crockett
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Val Watson
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Craig Wittenbrink
Hans-Juergen Wolters
Pak C. Wong

Panels

The selected panels promise to continue the tradition of informative and well attended tracks of the conference. A set of three panels, presented and moderated by leaders in the field, was assembled by the Panels Chairs, J. Edward Swan II, David Kenwright, and Hanspeter Pfister. Panels will discuss future directions of visualization platforms, visual design, and "big data" issues.

Video

As in every year, the proceedings are accompanied by a videotape of submitted animations. Thanks are due to the Video Chair, Robert J. McDermott, for his professional work and dedication in producing the video proceedings.

CD-ROM

As in the years before, the papers, case studies, panels, tutorials, and symposia are also provided electronically on a CD-ROM as a supplement to the proceedings. Thanks are due to Torsten Moeller, this year's Publications Chair, for assembling and producing this material.

Additional Material

In addition to the material in the proceedings, IEEE Visualization '99 includes two symposia, "Information Visualization" and "Parallel Visualization and Graphics," and a workshop on "Distributed Visualization Systems." The conference also features tutorials, demonstrations, and a Creative Applications Lab. Late Breaking Hot Topics sessions provide exciting views into the energetic field of visualization.

Additional Acknowledgments

Many individuals, whose names are not mentioned above, have contributed many hours and significant efforts in making IEEE Visualization '99 and these proceedings a success. Special thanks go to the Conference Co-Chairs Theresa-Marie Rhyne and Steve Bryson for their work and guidance in all aspects of the conference. Thanks also go to the Program Co-Chairs Charles Hansen, Deborah Silver, and Lloyd Treinish for making all this happen. Finally, we would like to thank Ted Tanasse, our logo designer, and ACM, specifically Stephen Spencer, ACM SIGGRAPH Director for Publications, for his invaluable assistance in assembling the proceedings. His dedication and talent are evident in the high quality production of the proceedings and CD-ROM.

We hope you find the wealth and depth of knowledge in the 1999 proceedings both interesting and useful. We hope you enjoy Visualization '99 and join us again for Visualization 2000 in Salt Lake City, Utah.

David S. Ebert, Markus Gross, and Bernd Hamann
Papers Co-Chairs and Co-Editors of the IEEE Visualization '99 Proceedings

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