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**Exploring Gigabyte
Datasets in Real
Time: Algorithms,
Data Management,
and Time-Critical
Design**

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Conference 3-8 August 1997
Exhibition 5-7 August 1997



Los Angeles Convention Center
Los Angeles California USA

Exploring Gigabyte Data Sets in Real-time:

Algorithms, Data Management and Time- Critical Design

SIGGRAPH '97
Course #4

Organizer:
Steve Bryson

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Speakers:
Steve Bryson
Michael Cox
David Kenwright

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Course Description

Modern data sets arising from computational physics are extremely large and involve complex, difficult to exhibit phenomena. "Real-time" interactive interfaces have proven useful for the analysis of these data sets, but "real-time" performance has been difficult to achieve with such large amounts of data. This course discusses the issues that arise in the "real-time" interactive visualization of very large (>100 gigabytes) data sets, presenting solution strategies emphasizing time-critical design which impact architectures, interfaces, algorithms, and data management.

Speaker Biographies

Steve Bryson is a research scientist with MRJ Technology Solutions, working under contract for the Data Analysis Branch of the Numerical Aerodynamic Simulation Systems Division at NASA Ames Research Center. He does research in the application of virtual reality techniques for scientific visualization, of which the virtual windtunnel is the main focus. Steve Bryson started in the virtual reality field in 1984 at VPL Research, working on a graphics based programming environment using the prototype dataglove for input. Later he was involved in work on the Dataglove model II. Mr. Bryson then joined Scott Fisher's VIEW lab at NASA Ames Research Center in 1987, where he was involved in integrating the various I/O and graphics systems into a virtual environment. This included research in software architectures for virtual reality systems and human factors. Mr. Bryson has served on the National Academy of Sciences/National Research Council Committee on Virtual Reality Research and Development. He was co-chair of the IEEE Symposium on Research Frontiers in Virtual Reality, program co-chair of the IEEE Virtual Reality Annual International Symposium '95, and general chair of the IEEE Virtual Reality Annual International Symposium '96.

Michael Cox is a senior research scientist for MRJ Technology Solutions at NASA Ames Research Center. His current work is in run-time systems for managing very large data sets for scientific visualization. Previous to MRJ/NASA, he developed algorithms and architecture for computer graphics hardware at Intel, S3 Inc, and Sun, and previously developed distributed systems at Sun and ACC. His Ph.D. is in computer science from Princeton University, where he worked with Pat Hanrahan on algorithms and architectures for parallel rendering. His B.A. is in Biology from UC Santa Cruz.

David Kenwright is a research scientist for MRJ Technology Solutions at NASA Ames Research Center. He received his BE degree with first class honors in 1988 and his PhD in mechanical engineering in 1994 from the University of Auckland, New Zealand. His PhD research led to the development of efficient algorithms for constructing three dimensional streamlines using dual stream functions. His current research interests include unsteady flow visualization and fluid dynamics.

Course Schedule

1 30 - 1 45	Introduction (David Kenwright)
1 45 - 2 30	Architectures and Interfaces (Steve Bryson)
2 30 - 3 00	Algorithms (David Kenwright)
3 00 - 3 15	Break
3 15 - 3 30	Algorithms (Continued) (David Kenwright)
3 30 - 4 30	Data Management (Michael Cox)
4 30 - 5 00	Time-Critical Design (Steve Bryson)

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