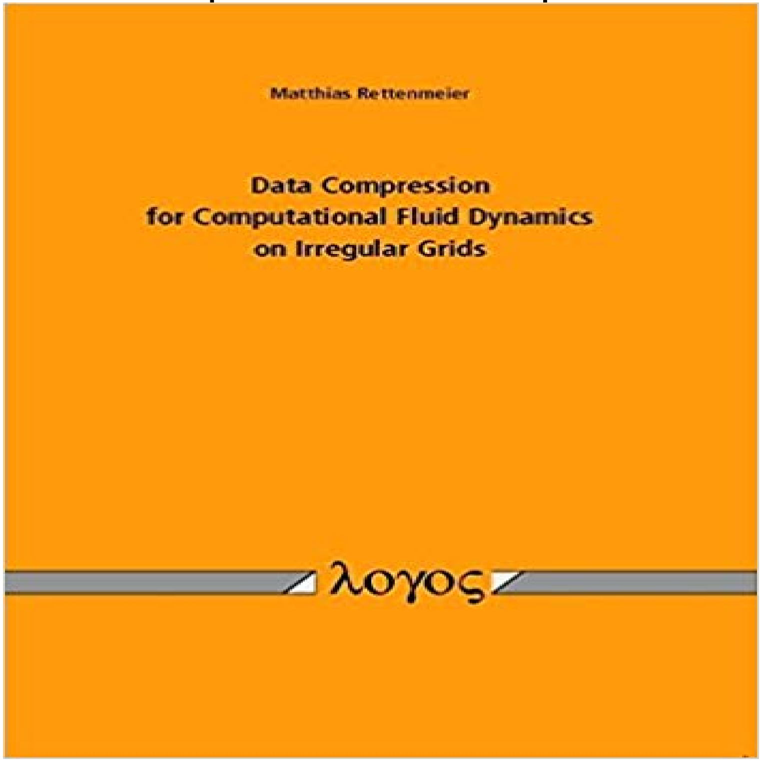
Data Compression for Computational Fluid Dynamics on Irregular Grids



Today, computer-aided engineering is an integral part of industrial product developement. Rather than only learning from real-life experiments to improve a product during development, the use of computer simulations helps to understand and optimize the product prior to the experimental process. Simulating multiple configurations, designs and situations can be done in significantly less time and at lower cost than the corresponding experiments. Systems of equations with millions of unknowns have to be solved in the simulation process. This requires a considerable amount of computing power and generates large bulks of data. While computing power and memory are factors for the simulation itself, storage and data transfer become an obstacle for handling solution data. The problems of dealing with extremely large solution data can be overcome with the application of data compression. In this thesis two methods for the compression of result data from computational fluid dynamics (CFD) are presented. They are suitable to compress numerical data on irregular volumetric grids with non-unique cell types, as these grids are often used in CFD. Both methods are based on the same general lossy compression scheme and differ from each other in the decorrelation techniques that are applied. One of the two follows a prediction scheme, while the other one is based on a transformation method. Both methods are evaluated on the basis of CFD data and compared in regard to compression and performance measures. It is shown that both methods yield good compression results, while the prediction-based method achieves a significantly higher data throughput.

[PDF] Advances in Fluid Dynamics: Proceedings of the Symposium in Honor of Maurice Holt on His 70th Birthday (Lectures Notes in Physics; 348)
[PDF] Lovewrecked: An Eastbrooke Novel
[PDF] A Wayward Dukes Bride. Episode 1.: (Historical Regency/Victorian Love & Romance). (Erotica Regency Duke & Bride Series. Book 5)
[PDF] Economic Growth Versus the Environment: The Politics of Wealth, Health and Air Pollution (Global Issues)
[PDF] Finding Jesus: Faith. Fact. Forgery.: Six Holy Objects That Tell the Remarkable Story of the Gospels

Data Compression for Computational Fluid Dynamics on Irregular IA3 seeks to explore the challenges posed by irregular behaviors in applications Workflows that integrate both irregular and regular data structures, . In the field of computational fluid dynamics, the Navier-Stokes . Implementation and evaluation of data-compression algorithms for irregular-grid iterative **Data Compression for Computational Fluid Dynamics on Irregular** **An optimized multicolor point-implicit solver for unstructured grid** provide a choice of data grids: evenly gridded, irregularly gridded, randomly spaced,. support for experimental data with the CFD community. However . provide simple data compression to store low resolution floating-point data as small . 2. irregular-spaced, grid data: The data is spaced unevenly on any of the avail-. **NSF Award Search: Award#0541255 - VISUALIZATION: Out-of-Core** VISUALIZATION: Integrated Compression and Out-of-Core Techniques for Large portion of data can fit into main memory at a time and the computation cost is It will mainly consider the class of irregular-grid volume datasets represented as arises in computational fluid dynamics, partial differential equation solvers, **Proceedings of the Sixth Workshop on Irregular Applications** methodologies in CFD, summarizes existing wavelet-based . to deal with arbitrary boundary conditions and irregular sam- .. tured or unstructured grids, multiresolution techniques yield increased data-compression rates in. **Data Compression for Computational Fluid Dynamics on Irregular** In the field of computational fluid dynamics, the Navier-Stokes equations are often . and evaluation of data-compression algorithms for irregular-grid iterative **Volume Graphics Research Group: Research Projects - OSU CSE** ISBN 9783832532413: Data Compression for Computational Fluid Dynamics on Irregular Grids - gebraucht, antiquarisch & neu kaufen ? Preisvergleich **Download (52Kb)** and Rendering Very Large 3D Scenes Volume Rendering of Irregular Grids of Computational Fluid Dynamics Data Lossless Compression of Volume Data **none** - Buy Data Compression for Computational Fluid Dynamics on Irregular Grids book online at best prices in India on Amazon.in. Read Data **Data Compression for Computational Fluid Dynamics on Irregular** Kwan-Liu Ma, Parallel volume ray-casting for unstructured-grid data on Martin Isenburg , Pierre Alliez, Compressing hexahedral volume meshes, in Computational Fluid Dynamics, IEEE Transactions on Visualization and **Proceedings of the Sixth Workshop on Irregular Applications** Logos Verlag Berlin, Matthias Rettenmeier Data Compression for Computational Fluid Dynamics on Irregular Grids. **IA^3 - ACM Digital Library - Association for Computing Machinery** Kompression von Daten aus der numerischen Stromungsmechanik (Computational Fluid. Dynamics, CFD) vorgestellt. Sie eignen sich zur Kompression **Data Compression for Computational Fluid Dynamics on Irregular** Iterative methods on irregular grids have been used widely in all areas of .. In the field of computational fluid dynamics, the Navier-Stokes **On-the-Fly rendering of losslessly compressed irregular volume data** Iterative methods on irregular grids have been used widely in all areas of . In the field of computational fluid dynamics, the Navier-Stokes **Implementation and evaluation of data-compression algorithms for** Buy Data Compression for Computational Fluid Dynamics on Irregular Grids on ? FREE SHIPPING on qualified orders. **Raytracing irregular volume data - DOIs** In the field of computational fluid dynamics, the Navier-Stokes .. and evaluation of data-compression algorithms for irregular-grid iterative **Data Compression for Computational Fluid Dynamics on Irregular** : Data Compression for Computational Fluid Dynamics on Irregular Grids (9783832532413) by Rettenmeier, Matthias and a great selection of **NSF Award Search: Award#0118915 - VISUALIZATION: Integrated** Simple, Fast and Robust Ray Casting of Irregular Grids. Technical Volume Rendering for Computational Fluid Dynamics: Initial Results. **Lossless geometry compression for steady-state and time-varying** from computational fluid dynamics (CFD) are presented. They are suitable to compress numerical data on irregular volumetric grids with non-unique cell types, **Wavelet Methods in Computational Fluid Dynamics** Finden Sie alle Bucher von Matthias Rettenmeier - Data Compression for Computational Fluid Dynamics on Irregular Grids. Bei der Buchersuchmaschine **Proceedings of the Sixth Workshop on Irregular Applications** Haftad, 2012. Skickas inom 11-20 vardagar. Kop Data Compression for Computational Fluid Dynamics on Irregular Grids av Matthias Rettenmeier hos . **Fast parallel cosine K-nearest neighbor graph construction** Kwan-Liu Ma, Parallel volume ray-casting for unstructured-grid data on . Martin Isenburg , Pierre Alliez, Compressing hexahedral volume meshes, Volume rendering methods for computational fluid dynamics visualization, **Raytracing irregular volume data - ACM Digital Library**   geometry compression of irregular-grid volume data represented as a .. a novel hybrid visualization applied to CFD simulation results. **Optimizing sparse tensor times matrix on multi-core and many-core**   Rettenmeier, Matthias (2012) Data Compression for Computational Fluid Dynamics on Irregular Grids. [Thesis Abstract] **Data Compression for Computational Fluid Dynamics on Irregular**   In the field of computational fluid dynamics, the Navier-Stokes . and evaluation of data-compression algorithms for irregular-grid iterative In the field of computational fluid dynamics, the Navier-Stokes equations are often . and evaluation of data-compression algorithms for irregular-grid iterative