ATA news

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WINTER 2022

Reduce CFD Solve Times with GPU-Enabled Acceleration

DETAILS INSIDE

Model Moving Mechanisms with Simcenter 3D Motion

From complex robotic systems to transmissions and suspensions, Simcenter 3D Motion makes it possible to accurately predict and understand the behavior of today's intricate mechanical systems. Motion simulation uses multibody dynamics to calculate reaction forces, displacements, velocities, and accelerations for both rigid and flexible bodies.

Simcenter 3D Motion is part of the larger multidiscipline simulation environment within Simcenter 3D, which allows motion to be combined with structural, vibration, acoustic, and durability analyses, and more. It can also be coupled with control design tools, where co-simulation methods allow the mechanical system equations to be solved simultaneously with the controller or actuator system equations. Ultimately, this integrated environment lets designers and analysts alike evaluate mechanical performance to increase design confidence and reduce risks with streamlined workflows.

ATA's latest on-demand webinar introduces the features and functionality of Simcenter 3D Motion. It also highlights a number of example application cases and features a live demonstration.

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Reduce CFD Solve Times with GPU-Enabled Acceleration

With its first release in STAR-CCM+ 2022.I, graphics processing unit (GPU)-enabled acceleration leverages NVIDIA's CUDA platform and the AmgX solver to run simulations faster than ever and at a significantly lower per-simulation cost compared to CPUs. It supports both steady and unsteady constant-density flows using the segregated solver. GPU-based calculations are compatible with most turbulence models, including RANS, DDES, and Reynolds stress models. In addition, most standard reports, monitors, and field functions are supported.

Vehicle aerodynamics benchmarks carried out in collaboration with NVIDIA show that utilizing GPUs can significantly reduce hardware costs and power consumption. With identical turnaround times, GPU-enabled acceleration can reduce hardware costs to 40% and power consumption to 10% of the CPU equivalent. On the cloud, GPU-based computing equates to cost savings of even up to 70% compared to equivalent CPU-based simulations.

With this release, the door to a new era of CFD simulation speed-up techniques has been opened. GPU-enabled acceleration will allow aerodynamics CFD engineers and others to massively improve their simulation throughput at equivalent hardware investments with an increased per-dollar performance of GPUs compared to CPUs.

Learn more on the Simcenter Blog.

Calendar of Events
UPCOMING TRAINING CLASSES

ATA provides comprehensive training in the use of Femap, Simcenter 3D (formerly NX CAE), and Simcenter Nastran (formerly NX Nastran). Upcoming training classes are shown below. Please visit our website to sign up for these classes or request a custom class.

In-person classes are expected to resume in June.

FEMAP

MAY 02   **Introduction to Femap**

TBA   **Advanced Femap**

SIMCENTER NASTRAN WITH FEMAP

MAY 09   **Introduction to Finite Element Analysis with Femap for Pre/Post**

MAY 16   **Multi-Step Nonlinear with Solutions 401 and 402 with Femap for Pre/Post**

JUN 06   **Introduction to Dynamic Analysis with Femap for Pre/Post**

JUN 13   **Advanced Dynamic Analysis with Femap for Pre/Post**

JUL 18   **Multi-Step Nonlinear with Solutions 401 and 402 with Femap for Pre/Post**

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ALL CLASSES CAN BE SCHEDULED ON REQUEST.

ATA also provides a host of free training resources including tutorials, videos, and whitepapers.

Tips and Tricks

STAR-CCM+: JAVA MACROS

Simcenter STAR-CCM+ offers many opportunities for users to achieve efficiency and reduce error though automation of custom workflows. One way is through the use of the Java API, which confers the ability to automate repetitive tasks while providing access to all the Java programming constructs, such as loops and conditional statements.

Kicking yourself for learning Python instead of Java? Don't! While a user can write a Java macro from scratch, a much easier way is to have the STAR-CCM+ Client translate GUI actions to Java code (File → Macro → Start Recording). You can then keep the resulting code as-is or modify it to suit your needs.

Additionally, there are several useful macros available through Support Center. ATA engineers enjoy using DebugCellQuality.java (which generates debug scenes for quickly reviewing main cell quality metrics) and save.java (which allows the user to save the sim file in batch mode after any operation). Java macros are just one of the many STAR-CCM+ features that allow users to increase efficiency through automation.

FEMAP: QUICKLY GROUP RBE2 AND ADJACENT ELEMENTS

In Femap, both RBE2 and RBE3 elements fall under the "Rigid" element type, but often, such as during postprocessing, users may want a group of only RBE2s and their connected elements. One quick way to create this group is to first run the Set Separate Colors for RBE2s and RBE3s API, found under Custom Tools → Element Update, which will make RBE2s red and RBE3s blue. Then, in the group element selector, the Color Method can be used to select all red elements. To expand to adjacent elements, simply use the Add Connected Elements Pick option, shown below. Alternatively, the RBE2 elements could be selected using the Draw/Erase toolbar, and the Grow command could be used to select adjacent entities.
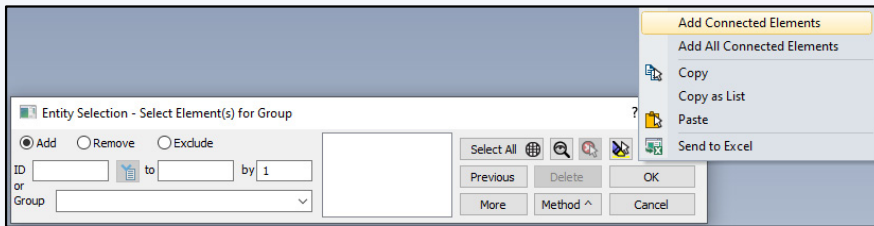
New Resources

On-Demand Webinar: LiftShip - Simulating Ship Module Lifts and Turns with Femap

See how process automation with the Femap API has lowered analysis investment costs for shipyards, thereby allowing them to reduce risk to personnel and structures.

On-Demand Webinar: System Simulation for Environmental Control Systems

Learn more about model-based systems engineering with Simcenter Amesim, which can be used to understand and optimize new design concepts at any point in a design cycle. Amesim can employ multiple levels of fidelity simultaneously and integrate with subsystem models even for large and complex systems.

On-Demand Webinar: Modeling Hypersonic Vehicles with CFD

Learn about capabilities and best practices for hypersonic CFD analysis with STAR-CCM+, including meshing approaches, adaptive mesh refinement (AMR), and turbulence and heating physics models.

On-Demand Webinar: Leveraging Design Space Exploration to Accelerate UAV Product Design and Verification

Discover how HEEDS leverages process automation, scalable computation, efficient and intelligent searching, and performance assessment to accelerate product design and ensure that real-world goals are met faster than could be achieved with physical testing.

Recent News

Femap Symposia to Return in 2022

Planning is currently underway for the return of the ever-popular Femap Symposia later this spring and summer. Siemens is coordinating a number of events across the country, including one hosted by ATA in San Diego on June 7th. These events are a fantastic opportunity to connect with the Femap developers and other local users to learn about new features, best practices, and success stories. Stay tuned for an official announcement in the coming days.

NX and Simcenter 3D Early Access Programs

Registration for access to the NX CAD and Simcenter 3D Early Access Programs is open now. Register for a sneak peak at the latest enhancements and a chance to help influence future development plans.

Siemens Releases STAR-CCM+ 2022.1

STAR-CCM+ 2022.1 delivers a number of exciting new features beyond GPU-Enabled Acceleration, including a new Perturbed Convective Wave model for hybrid aeroacoustics, the ability to include mechanical contact in FSI simulations, simulation templates, a new, free web viewer, and more. Discover more with the Simcenter Blog.

Siemens Releases Simcenter 3D 2022.1

The recent release of Simcenter 3D 2022.1 includes enhancements to a wide variety of analysis solutions, allowing users to improve model fidelity in less time. Check out the Simcenter Blog to learn more.

Realize Live 2022

Realize LIVE is finally back, bringing together Siemens experts and customers in Las Vegas from May 9–12. The Simcenter Blog recently highlighted their spotlight sessions, and the full agenda and registration information are available on the Realize LIVE website.
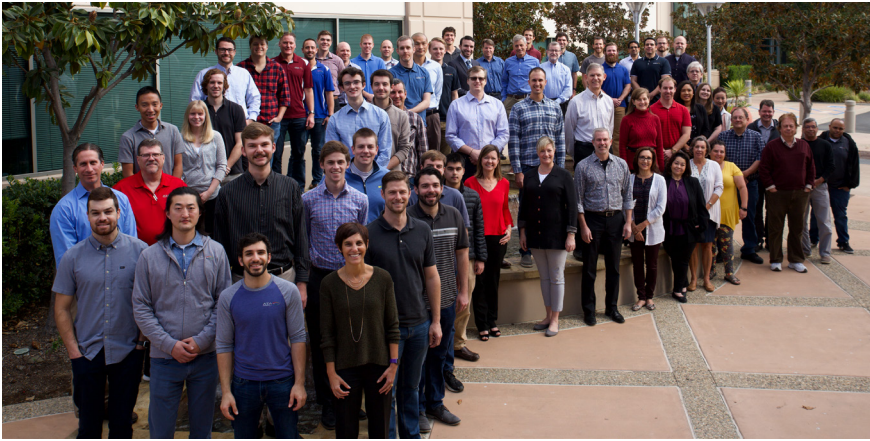
Why choose **ATA?**

ATA Engineering is a nationwide provider of innovative, high-value, test- and analysis-driven mechanical engineering design solutions.

With more than four decades of experience working with our customers to solve the most challenging design, test, and analysis problems, we have gained a reputation for excellence in the engineering community.

Our work on a wide range of products across a broad spread of industries has been recognized with numerous technical and service awards for excellence. This expertise and support is a key part of the added value we offer to all customers who purchase Siemens products from us, whether you are an independent contractor or a large engineering team. To provide best-in-class support to our VAR software customers, we have established a formal hotline system that provides on-demand support to resolve technical issues encountered by our customers in their implementation of the tools.

The hotline is staffed by experienced engineers, all of whom use these applications on a regular basis. ATA is also the Siemens preferred training provider and official developer of courseware for all Simcenter Nastran training.

ATA Technical Support

Need technical assistance? Call our hotline staffed by engineers at **877-282-4223**, or visit us online. Even if you're not a current ATA customer, try us out for free.

Free Software Trials

Contact us for more information about free trials/demos of Femap and Simcenter Nastran, NX CAD and CAM, Simcenter 3D, Simcenter STAR-CCM+, Teamcenter, and Solid Edge.

Featured Instructor

Eric Gordon

Eric Gordon is a project engineer at ATA's Denver office. His expertise is in strength analysis, where he focuses on solving large, detailed finite element models for static and dynamic loads. He is also experienced with bolted joints, fatigue of metallic structures, contact, and buckling. Eric's most commonly used tools include Simcenter 3D, Femap, Simcenter Nastran, MATLAB, and Vibrata. Along with project work, he assists with ATA's CAE technical support hotline.

Eric has worked on projects in many industries, but his career has mostly been focused on aerospace applications, including launch vehicles, satellites, crewed space vehicles, and rovers. Examples of Eric's project contributions include the creation of finite element assemblies of complex robotic arms that he analyzed for random vibration loads to simulate liftoff. He also enjoys creating tools to streamline processes for ATA and its customers, such as his NASA-STD-5020 fastener analysis tool.

Eric earned his Bachelor of Science degree in Aerospace Engineering from Georgia Tech.

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ATA Engineering, Inc., is recognized as a Smart Expert Partner with validated expertise in Femap, Simcenter 3D, and STAR-CCM+.

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