

ATA news

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ISSUE FIVE



SPRING 2016

Siemens Releases Femap v11.3

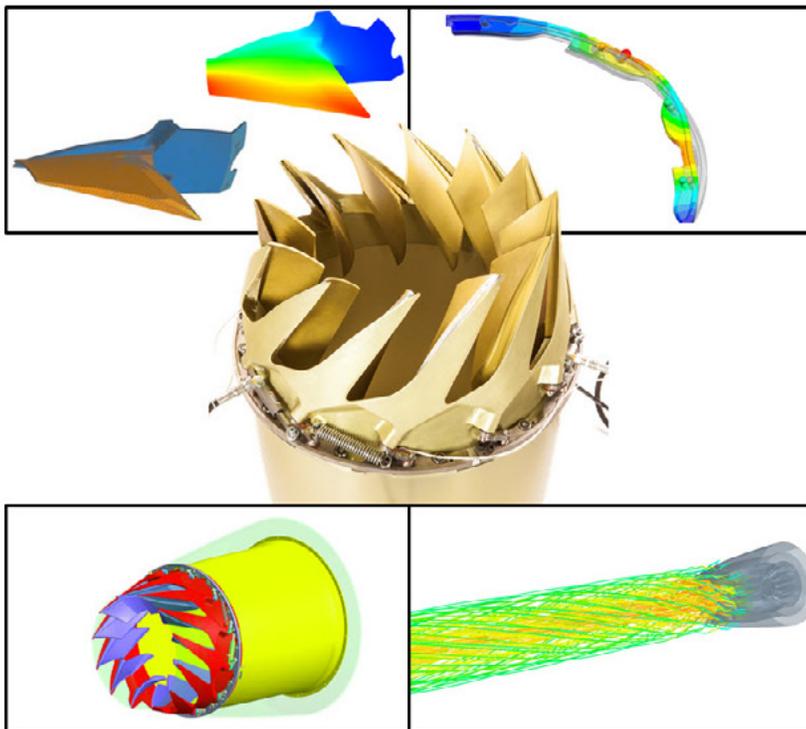
Version 11.3 of Femap, released May 3, 2016, is full of enhancements ranging from updated rotate commands to the new Roll-Thru tool that allows users to travel inside their model.

There are several new visualization and preprocessing features. The draw/erase toolbar quickly hides and displays model entities without creating permanent groups. There is now a front pick option for easier entity selection, and a revamped element face selection window. The meshing algorithms continue to advance, now including Max Quads for triangle elimination and better mesh generation on highly curved surfaces, plus the ability to paint on mesh refinement.

In postprocessing, contour arrows provide a welcome enhancement. Automatic formatting predicts what you want to see based on a single output vector selection, bringing up related vectors, switching between directional and tension/compression arrows, and toggling contoured colors.

Solver support now includes enforced displacements using SPCs as well as the introduction of spring to ground elements. ANSYS and Abaqus support has also been expanded, and Abaqus ODB files can be attached and results viewed with complete postprocessing functionality.

The improvements are wide-ranging, exciting, and, as always, customer driven. To learn more, check out ATA's on-demand webinar, [What's New in Femap 11.3](#).



ATA Engineering Develops Technology for Quieter Aircraft

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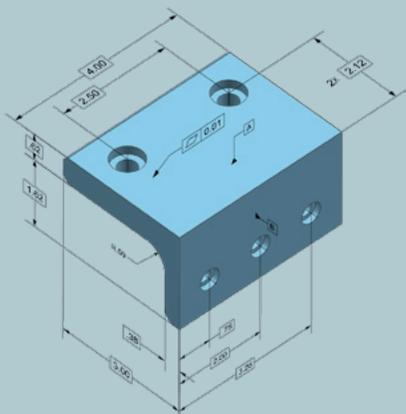
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ATA Develops Technology for Quieter Aircraft

ATA's Engine Air Brake (EAB) recently underwent a successful full-scale engine test, the latest milestone on its path toward supporting the goals of NASA and the aircraft industry for next-generation quiet aircraft. Along the way, ATA used NX to develop CAD assembly models and arrangements of the geometry as well as to model mechanisms including the vanes, linkages, and hydraulic rams. In addition, NX was used to perform structural analysis on components and to generate manufacturing drawings. Check out [this article](#) for more information about the EAB, and visit us at PLM Connection 2016 to learn more about concurrent design, analysis, and manufacturing success with NX.



Calendar of Events

UPCOMING TRAINING CLASSES

ATA provides comprehensive training in the use of Femap, NX, and NX Nastran. Upcoming training classes and webinars are shown below.

NX NASTRAN WITH FEMAP

- JUN 6** [NX Nastran Introduction to Finite Element Analysis](#)
- JUN 13** [NX Nastran Introduction to Dynamic Analysis](#)
- JUL 13** [NX Nastran Aeroelastic Analysis](#)
- JUL 14** [NX Nastran Coupled Structure/Acoustic Analysis](#)
- JUL 15** [NX Nastran Rotor Dynamics](#)
- AUG 1** [NX Nastran Introduction to Finite Element Analysis](#)

NX NASTRAN WITH NX CAE

- JUN 6** [NX Nastran Introduction to Finite Element Analysis](#)
- JUN 13** [NX Nastran Introduction to Dynamic Analysis](#)
- JUL 14** [NX Nastran Coupled Structure/Acoustic Analysis](#)
- JUL 15** [NX Nastran Rotor Dynamics](#)
- AUG 1** [NX Nastran Introduction to Finite Element Analysis](#)

FEMAP

- AUG 16** [Introduction to Femap](#)

UPCOMING SEMINARS AND WEBINARS

- JUN 7** [NX PMI](#)
Product and manufacturing information, or PMI, allows the user to attach information such as dimensions, tolerances, and material notes to parts and assemblies in 3-D environments. Adding this information throughout the design process can shorten the overall design cycle by facilitating improvements in team collaboration and streamlining documentation efforts. This webinar will introduce basic PMI concepts and benefits as well as demonstrate PMI workflows using NX.
- AUG 9** [NX Nastran: Model Reduction and Superelements](#)
Superelements provide a powerful means of generating reduced representations of components with significantly fewer degrees of freedom. Attend this webinar to learn more about the benefits of and motivation behind superelements as well as to gain useful insights into their various applications in NX Nastran.

ATA also provides a host of [free training resources](#) including tutorials, videos, and whitepapers.

Tips and Tricks

FEMAP: 11.3 CHANGE ROTATION AND ZOOM CENTER

Many advanced CAD and CAE programs allow the user to rotate and zoom around the cursor. These features are also available in the new release of Femap v11.3: the zoom feature can simplify model navigation, and the rotate function centers on the closest entity on screen, meaning the model never swings out of view. These tools can be accessed via file → preferences → user interface, or by adding a toolbar icon.

NX NASTRAN: MODEL REDUCTION AND SUPERELEMENTS

Superelements automate the process of creating reduced representations of components with significantly fewer degrees of freedom and can efficiently assemble them into a system model. Superelements can be especially beneficial when:

- An assembly of all component models representing a system is too large
- Some component models are proprietary
- Design studies will be performed where most of the system remains unchanged
- Nonlinearities in a system can be isolated to a small region
- Models for a system do not follow unique numbering schemes

For more information about different types of superelements and their implementation, be sure to check out [these whitepapers](#).

NX: IMPROVING TETRAHEDRAL MESHING DEFAULTS

Mesh quality plays an important role in generating valid FEA results, and updating some default mesh options in NX IO can greatly improve tetrahedral meshes. Try these suggestions in conjunction with surface coats and size controls to achieve high-quality meshes for complex geometries:

- Set the Max Jacobian to 1.5 when using the Mixed Midnode Method. NX will iteratively linearize poor parabolic tetrahedral elements that otherwise might generate tolerance warnings in the solver.
- Use a Small Feature Tolerance of 0.00. NX will attempt to mesh all features without performing any geometry abstractions.
- Lower the Surface Curvature Based Size Variation to yield a more constant element size, or increase it for more mesh refinement on curved surfaces.

New Resources

[NX: Introductory Tutorial—Meshing](#)

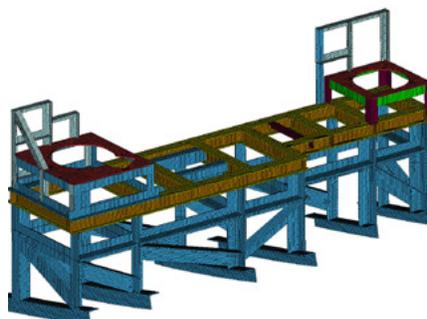
This beginner's guide walks step by step through meshing the components of a simple circuit card assembly. In addition to demonstrating the meshing process for tetrahedral, brick, shell, and concentrated mass elements, the tutorial also teaches basics such as idealizing the geometry, assigning materials, controlling mesh sizes, and generating geometry-based connection elements. Once you have mastered these meshing concepts, be sure to watch for the next installment of NX CAE tutorials, which will cover using assembly FEMs and setting up loads and boundary conditions.

[Femap API: Create Surfaces from Mesh](#)

Although Femap has a built-in function to generate surfaces from a mesh, doing so throughout a large model can be tedious. This API automates the selection of the element groups. The new geometry is quite accurate and can easily be remeshed for a new FEM. Tip: Create element groups using the autogenerate feature with angle breaks and non-manifold edges on.

[NX Open and Femap API: Check Elements](#)

Due to different tolerance levels, some elements may be flagged with a warning by the NX or MSC Nastran solvers despite passing the element quality check functions built into NX CAE or Femap. This program, which can be used as an NX Open tool or a Femap API, parses an .f06 file and adds any elements that exceeded the solver's tolerances to a new group in the FEA program. This allows the user to easily identify and correct the problematic elements.



Recent News

ATA Releases New Versions of IMAT, IMAT4XL, and Attune

IMAT v6.1.0: IMAT facilitates data sharing between MATLAB, analysis tools, and test software. This release brings many enhancements, including simplified results partitioning and improved FRF estimation. [Read more here](#).

IMAT4XL v6.1.0: This stand-alone GUI, which links IMAT import, export, and math functionality to Microsoft Excel, has been updated to utilize the latest IMAT release. [Read more here](#).

Attune 2.1.4: Attune is a flexible MATLAB-based toolkit that automates the test-analysis correlation process and provides powerful model optimization tools. This release adds support for the latest MATLAB and IMAT versions, enables the import and export of files that control the mapping between test and analysis nodes, and allows the creation of user-defined sets that capture the intersection between these nodes, which can then be used to create a reduced mass matrix. [Read more here](#).

Last chance to register for PLM Connection 2016

Siemens PLM Connection Americas User Conference 2016 will be held May 16–19, 2016 in Orlando, Florida. Regular registration has closed, but late/walk-in registration is available up to the conference date. Representatives from ATA will present three papers and host one demonstration and will also be on hand to answer your CAD and CAE questions.

[Registration is still available!](#)



Why choose **ATA**?

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

With more than three 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 PLM Software-preferred training provider and official developer of courseware for all NX 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

Interested in trying out Siemens PLM software? Visit our website to access free trials/demos of [Femap and NX Nastran](#), [NX CAD, CAM, and CAE](#), [Teamcenter](#), and [Solid Edge](#).



Featured Software Service Engineer

Jonathan Hill



Jonathan Hill recently joined the software services group at ATA Engineering, Inc., and like many of his peers, he supports a number of analysis projects in addition to his contributions toward software classes, publications, and customer support.

Mr. Hill has experience with the development of finite element models as well as static and dynamic analysis methods. He has been involved in the structural analysis and design of a variety of aerospace and commercial components, including those for launch vehicles, satellites, and aircraft. The majority of his projects use NX, Femap, and NX Nastran.

He has a B.S. in Mechanical Engineering from the Georgia Institute of Technology.

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