

Webinar: What's New in Femap 2019.1

Jonathan Hill, ATA Engineering July 10th, 2019

13290 Evening Creek Drive S, Suite 250, San Diego CA 92128

in ata-engineering

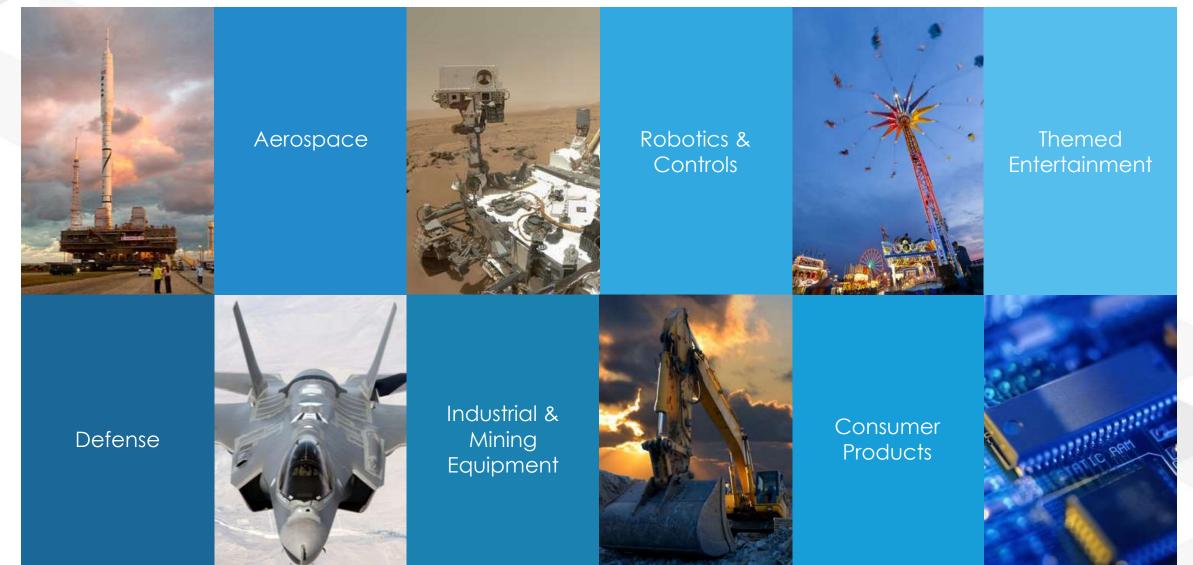
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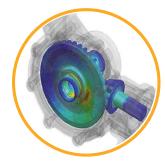
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 - ≻ Femap
 - Simcenter Nastran (formerly NX Nastran)
 - Simcenter 3D
 - ➢ NX CAD & CAM
 - ➤ Teamcenter
 - ➤ Solid Edge
- > Contact the hotline at 877-ATA-4CAE or

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- > Developer of the official Simcenter Nastran training materials
- > Preferred North American provider of Simcenter Nastran training
- > Recognized as Smart Expert Partner with validated expertise in

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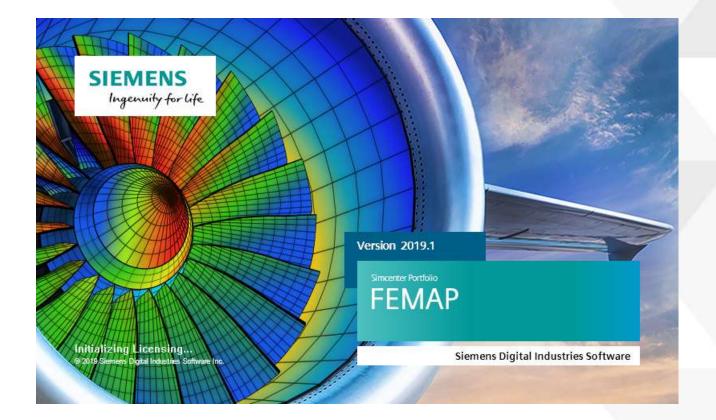


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Agenda

- 1. Introduction
- 2. Visualization and User interface
- 3. Geometry
- 4. Pre-Processing
- 5. Solver Support
- 6. Post-Processing
- 7. Q&A's



Femap 2019.1 is Available Now

- Femap 2019.1 has been released and is available for download through GTAC:
 - <u>https://download.industrysoftware.automation.siemens.com/</u>
- > Don't forget to download a new license file, also available from GTAC:
 - https://www2.industrysoftware.automation.siemens.com/LicenseManagement/Application
- This release enables users to maximize their efficiency of FEA tasks by building upon Femap's strong capabilities
 - ➢ Geometry idealization and processing for FE models
 - > Powerful meshing, model creation and interactive editing
 - > In-depth support for industry standard solvers
 - Flexible customization tools to streamline analysis processes





Femap 2019.1 Introduces a New Naming Convention and Release Cadence

Femap's rebranding as Simcenter Femap reflects its inclusion in the Simcenter portfolio of Siemens CAE products

- > NX Nastran is similarly rebranded as **Simcenter Nastran**
- Rebranding does not inherently alter Femap or Nastran outside of new release updates and enhancements

Simcenter Femap 2019.1 supersedes Femap 12.0

- Simcenter Nastran 2019.1 supersedes NX Nastran 12
- ➢ Femap will be released on a biannual cadence every April and October
 - ➢ Feature releases will add new features and expand functionality
 - Feature releases will be accompanied by database changes and will require licensing updates
 - ➤ Maintenance fixes will be released as needed

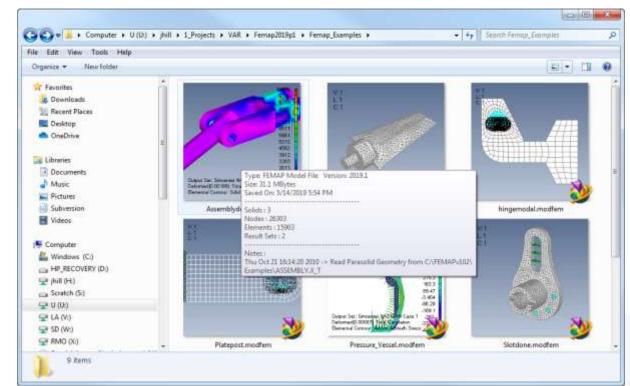


Visualization and User Interface

File Preview and Previous Vectors

Models and basic entity statistics are available for preview in File Explorer:

- ➢ Femap Version
- ≻Size
- ≻Save date
- ➤ Number of entities
- ➤ Model notes from File > Notes
- Previous vectors can be recalled



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Visualization and User Interface

Locate in Model Info and Entity Selection

Locate in Model Info option highlights selected entities in the model info pane

➤Entity selection enhancements include:

- ≻New Icons and more ID space
- ➤ Select Visible button
- ➤ Select Visible Only pick option
- ➤ Using Orientation Node method

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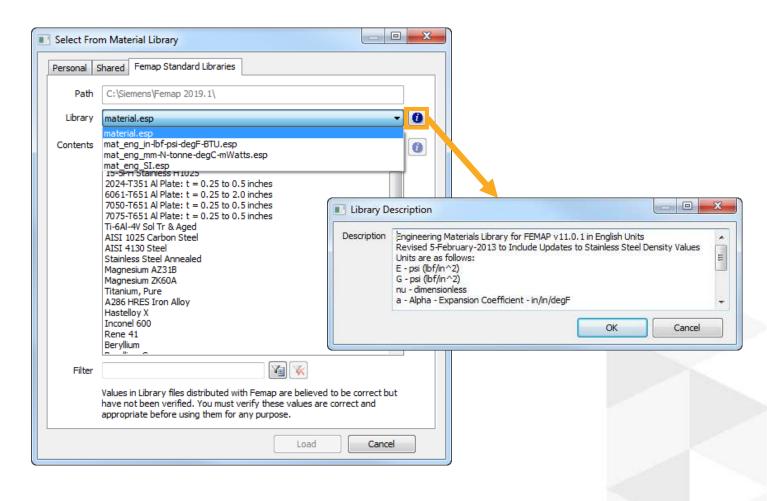


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Preprocessing

Libraries and Project Nodes/Points

- Material and property libraries offer greater flexibility
 - Quickly switch between standard Femap libraries, personal libraries, and shared libraries
- Project points and nodes radially about an axes or spherically about a point
 - Modify > Project > Node/Point



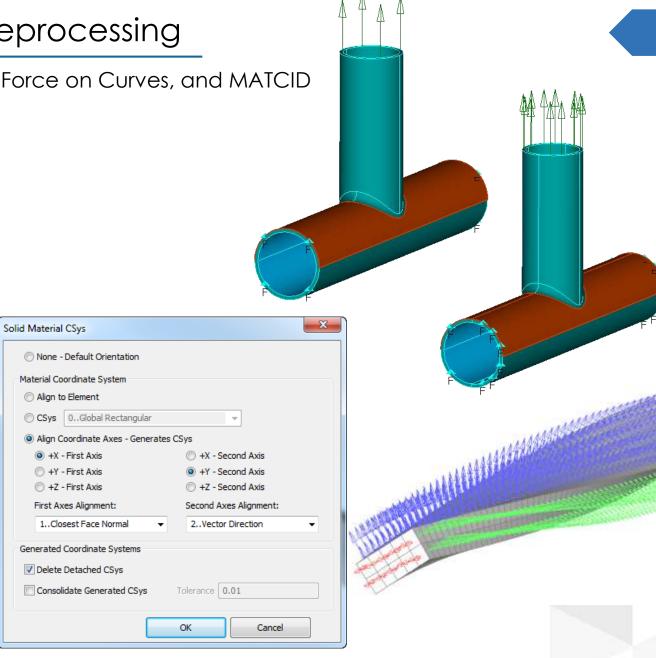


Preprocessing

Geometry Split, Force on Curves, and MATCID

Geometry-based definitions are propagated during geometry split operations:

- > Loads, Constraints and Regions
- Colors, layers, and solid attributes
- ➢ Bearing Force on Curve and Torque on Curve loads are available
 - Similar to Bearing Force/Torque on Surface commands
- ➤Material Coordinate Systems can be specified on solid elements (MATCID card) Modify > Update Elements > Solid Material CSys...



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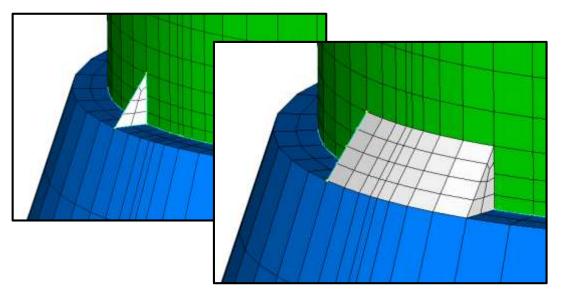


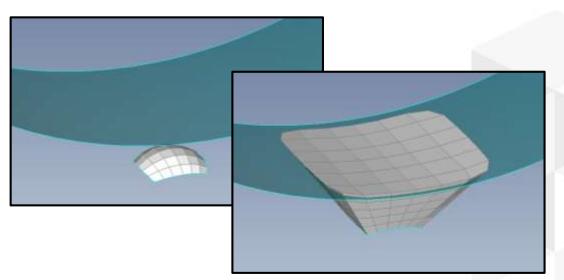
Meshing

Element Sweep and Extrusion

Sweep along element edges

- Select a single element edge
- Sweep operation continues until it connects back on itself, the end is reached, or a stop node is specified
- As elements are swept, the mesh morphs to maintain a match with existing mesh edges
- Extrude elements along element normals to selected surfaces
- Extrude shell elements in both directions



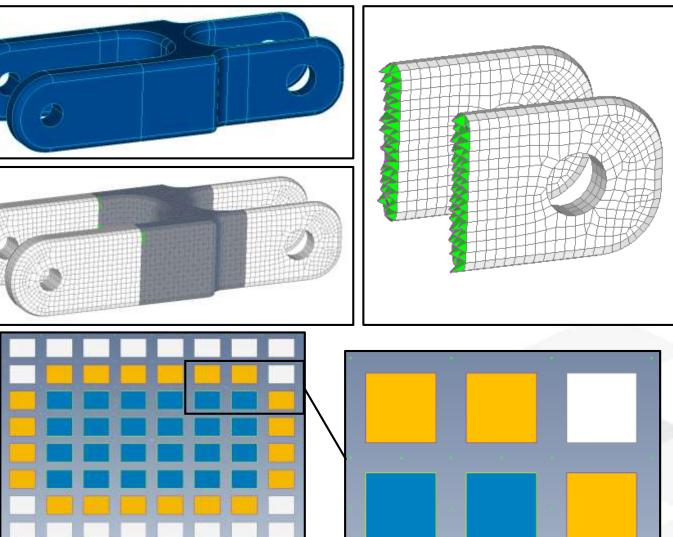




Meshing

Element Transitions

- Automatically generate pyramid elements to transition between hexagonal and tetrahedral elements
 - Femap will manage node connections between linear bricks and parabolic tetrahedral elements
- Connect mixed linear and parabolic elements
 - Choose between removing midside nodes on parabolic side or adding them on the linear side
 - Modify > Update Elements > Connect Linear/Parabolic Elements





Simcenter Nastran

- Femap 2019.1 comes with Simcenter Nastran 2019.1 (January 2019)
- ➢ New SOL 401 and SOL 402 sequences:
 - > Nonlineaer dynamics
 - ➤ Linearized buckling
 - Arc-length methods in statics
- SOL 401 allows for bolt preload on 1D elements, supports PCOMP and PCOMPG, offers more robust contact modeling, and has a new transient dynamic subcase
- ➢ SOL 200 supports frequency response analysis
- ➤ Additional enhancements:
 - Numerical improvements to RDMODES solutions
 - > Extension of shared memory parallel (SMP) to element matrix assembly (EMA) operations
 - > Automatic selection of numerical improvements for frequency response
- The STATSUB case control command gives greater flexibility when setting up SOL 105 buckling analyses.



Solver Support

ANSYS and ABAQUS

>ANSYS translator adds read/write support for:

- Non-normal pressure definitions
- ➢ Beam preload and solid preload
- Additional commands for random vibration analysis, including SPOPT, PSDUNIT, PSDFRQ, PSDVAL, PFACT, and PSDCOM
- > Output control KEYOPT(8) for laminates and solid laminates
- ABAQUS translator allows users to specify thermal options for gap elements and contact
 - ➤ Accessed via the ABAQUS Thermal button



Postprocessing

Contour Plots and Flutter

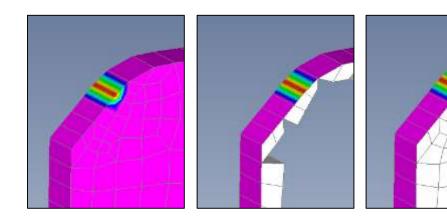
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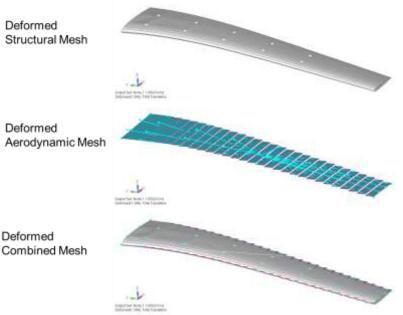


List > Output > Format consolidates:

> List > Output > Standard List > Output > Use Format

- ➢Aero mesh displacement results from flutter analysis can be displayed
 - Modes data is read from the .f06 output file
 - > PARAM, OPPHIPA must be set to 1 for splined aero data





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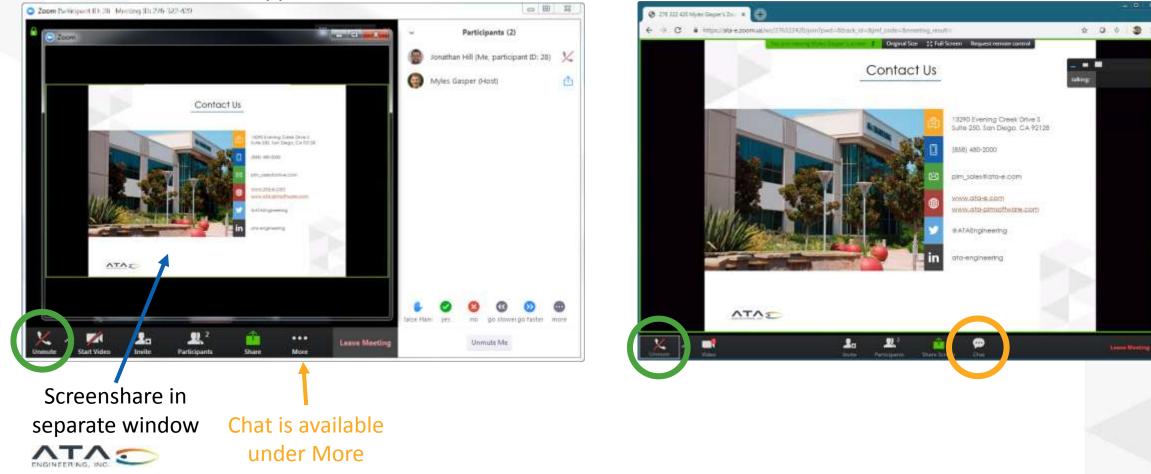
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Questions?

Submit questions in the chat or unmute yourself now

Zoom Application



Web Interface

Contact Us



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