HyperWorks® is a comprehensive simulation platform for rapid design exploration and decision-making. HyperWorks provides a tightly integrated suite of best-in-class tools for all facets of the simulation process: modeling, analysis, optimization, visualization, reporting and collaborative simulation management.

The HyperWorks® 13.0 Student Edition offers many new functionalities in such areas as lightweight design, composites structures analysis, efficient modeling and meshing, multiphysics and multi-disciplinary analysis, structural optimization and design exploration.

The Student Edition comprises a suite of applications that includes HyperMesh®, OptiStruct®, RADIOSS®, HyperView®, HyperView Player®, HyperStudy®, HyperGraph®, MediaView™, TextView™, MotionView®, TableView™, Process Manager™, solidThinking Evolve®, and solidThinking Inspire®

The HyperWorks® 13.0 Student Edition brings all this to your private Mac.

Please note, the HyperWorks 13.0 Student Edition is based on HyperWorks Desktop which is an integrated user environment for modeling and visualization. It can be used to pre-and post-process finite element models as well as to manage and visualize simulation and test data. The applications available through HyperWorks Desktop interact with each other. For example the view (rotations, pan, zoom) between HyperMesh and HyperView can be synchronized, or HyperView, MediaView and HyperGraph time history animations are synchronized.

The following summary provides an overview on the programs included in the HyperWorks 13.0 Student Edition.

**Modeling And Visualization Capabilities**

Across HyperMesh, HyperView and HyperGraph tools like the Entity Editor, Plot browser and the Advanced Build Plots panel ensure faster access to data and modification of multiple entities simultaneously. This release provides a variety of CFD related meshing feature updates and mesh quality review functionality. The already strong offerings for composites modeling have been refined with various updates and additions to existing features and procedures. Advancements in the tools for model assembly improve the handling of more and more complex models.
HyperMesh
• Powerful tool for creating and understanding finite-element models
• Basic FEA: User interface that will allow users from the novice to expert level to run a broad range of simple analyses [with OptiStruct as the solver in the background].
• OptiStruct, RADIOSS and CFD-AcuSolve user profile included

HyperView
• General-purpose visualization tool for CAE results

HyperGraph
• User-extensible plotting tool for CAE data

MotionView
• Open tool for understanding and improving multi-body systems

CAE Result Player
• HyperView Player Plug-in and stand-alone utility to share and visualize 3D CAE models and results

HyperWorks Collaboration Tools
• Simulation data organization and management

Usability
• The new Entity Editor provides an efficient way to create and edit cards in HyperMesh. Many attributes can be adjusted simultaneously across entities. Solver rules are captured to help set up new decks, and tooltips explain parameters without looking into the manual.
• Similarly HyperView offers an Entity Editor to modify attributes of multiple entities at the same time. HyperGraph introduced a Plot browser and an advanced Build Plots panel for efficient creation and manipulation of curves.
• Report generation just got easier with a completely new PowerPoint export functionality. A permanent link between HyperWorks Desktop applications and PowerPoint allows for updates of individual parts of the post-processing session.
• Markers can be tracked in MediaView to generate plots in HyperGraph.

Meshing
• **HyperMesh** offers two new meshing algorithms for CFD meshing. The Octree mesher is a faster and high quality alternative to the proven advancing front meshing algorithm and can be used for other than CFD applications as well. There is also a new boundary layers generator combining the smoothness of existing algorithms with added robustness and user control to handle any complex model.

• The Adaptive Wrapper mesher is a quick and robust way to generate a closed surface mesh for complex models while maintaining model details.

• The Quality Index panel offers a patch checker allowing you to cycle through areas with elements failing user defined criteria. Additional improvements for mesh modification helps remove these conflicts throughout the review process.

• The model can be contoured by user-defined quality criteria. The legend allows for detailed modification of display and criteria with innovative on-screen manipulators. Fillets, are provided with this release.

• For model checking purposes, a utility to find or identify duplicate or intersecting parts is available. **HyperMesh** introduced comparison tools identifying differences between two meshes, CAD and meshes, or CAD amongst each other.

**Composites**

• **HyperMesh** now has a dedicated Aerospace user profile providing many tools and processes specific to the Aerospace industry, as well as composites applications of other verticals.

• The already efficient composites modeling process received a variety of useful updates. In addition to improved display and handling of plies and laminates, a review of orientations, elements, materials and ply systems is available in both HyperMesh and HyperView.

• **HyperMesh** features a new Drape Estimator to derive ply angle deviation and thickness variation due to draping.

• When composites analysis with shell elements isn’t detailed enough, **HyperMesh** can convert a shell model into an equivalent solid model and automatically generate the necessary properties.

• **HyperView** offers functionality to generate Free Body Diagrams to analyze forces and moments in section cuts.

• Systems for bars can be plotted and results transformed between different systems.

**HyperWorks Solvers**

HyperWorks solver technology includes finite-element-based linear and non-linear structural analysis, design and optimization capabilities (OptiStruct), and finite-element-based highly nonlinear structural analysis under dynamic loading (RADIOSS). Combined with design optimization technology and multi-physics capabilities, HyperWorks enables users to drive the product-development process and make reliable decisions based on high-quality results.
In the MAC Student Edition the following solvers are included:

- **RADIOSS**: Finite-element-based highly nonlinear structural analysis under dynamic loading
- **OptiStruct**: Finite-element-based linear and non-linear structural analysis, design and optimization capabilities

**Optimization**

Many new capabilities have been introduced to reinforce Altair’s leadership in simulation-driven design and design-oriented, optimization-enabled solutions:

- **OptiStruct**’s multi-model optimization allows running multiple models with common design variables simultaneously
- The use of Excel spreadsheets for external response definition in **OptiStruct** is enabled
- Optimization problem setup and solution is possible in the native **RADIOSS** input format

**Multiphysics**

An expanded number of solution types and material models broaden HyperWorks’ multi-physics offering:

- Native large displacement (quasi-)static analysis with hyper-elastic and elasto-plastic materials as well as small sliding surface-to-surface contact is available in **OptiStruct**.
- **OptiStruct** also offers nonlinear heat transfer analysis, as well as a new rotor dynamics, for frequency response and complex eigenvalue analysis.
- In **RADIOSS**, enhanced airbag modeling regarding finite volume gas modeling, contact, material and element formulation is now offered.
**Usability**

- A brand new contact definition (Type 24) for zero gap solid-to-solid contact modeling has been introduced in **RADIOSS**.
- Overall usability has been improved via detailed error messaging, model checking, result output, documentation, and tutorials.

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**Ideation And Conceptual Design**

**solidThinking Inspire**

solidThinking Inspire enables design engineers, product designers, and architects to create and investigate structurally efficient concepts quickly and easily. Inspire enhances the design process by generating a new material layout within a package space using the loads as an input. The software is easy to learn and works with existing CAD tools to help design structural parts right the first time, reducing costs, development time, material consumption, and product weight.

Major new capabilities in solidThinking Inspire 2014 include:

- **Geometry Simplification** – Clean up and defeature problem areas in the geometry including imprints, rounds, fillets, holes, and pocket.
- **Analysis** – Investigate linear static and normal mode analysis on a model
- **Displacement constraints** – Displacement constraints can be applied to a model to limit deflections in desired locations and directions.
- **Smoothing options** – Create surface models from Inspire and export as a geometry file.
- **Concentrated Mass Part** – Connect concentrated mass either on a part or at a point in space.

**solidThinking Evolve**

solidThinking Evolve allows industrial designers to develop forms faster. It enables you to capture an initial sketch, explore styling alternatives, and visualize products with realistic renderings generated in real time. Evolve provides organic surface modeling and parametric control, with NURBS-based surfaces and solids and a unique ConstructionTree history feature.

Major new features in solidThinking Evolve 2014 include:

- **Improved modeling tools** – Refined replication tools for a more intuitive workflow, increased surface control for the Round tool, and more robust deformation tools.
- **New construction aids and scene management** – New and improved snaps, new isolate mode, better management of hiding/showing objects, and many new hotkeys to increase workflow efficiency.
- **Enhanced user interface options** – Simplified workflow for importing and controlling background images, new options to enable/disable selection pre-highlighting, and a mode to quickly disable curve visualization for better model evaluation.
Multi-Disciplinary Design Exploration, Study and Optimization

Expand your horizon with HyperWorks design exploration tools; performing “what-if” studies, understanding and optimizing system behavior with HyperStudy and performing complex custom calculations with HyperMath.

HyperStudy continues its fast pace of development based on the updated product released in version 12.0.

Some of the new functionality HyperStudy 13.0 offers are:

- Simplified study setup via enhanced model definitions and a new, powerful Parameter Editor
- Trade-off studies portable to Excel spreadsheets
- Localization of user interface. Languages added to HyperStudy are: Japanese, Korean, Chinese, German and French
- Simplified optimization setup simplified via automatic method selection and reduced display of method settings

Limitations

- The HyperWorks 13.0 Student Edition may NOT be used for commercial purpose
- Model size limitations:
  - Structural models (RADIOSS; OptiStruct): 10000 nodes.
- Supported CAD formats
  - Import: IGES and STEP
  - Export: IGES and STEP
- Supported FEM formats
  - Import / export: RADIOSS, OptiStruct, and AcuSolve
- Both finite-element-based solvers OptiStruct and RADIOSS may only be started from within the HyperMesh Interface
- Overwriting RADIOSS files while solving is not allowed.
- AcuSolve, HyperMath, HyperCrash, and MotionSolve are not included
- The student edition is only available on the Altair Online Store; no DVD medium is available; no service updates
- Platform: MacOS X10.8 and later are supported
XQuartz replaces the legacy X11 Apple bundle. If running Mountain Lion 10.8.2 or higher the version 2.7.5 of XQuartz is the minimum version that should be
used. You can download and install XQuartz from here:

http://xquartz.macosforge.org/landing/

- Help is available online

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www.altairuniversity.com

For more detailed information about the programs included in the **HyperWorks 13.0 Student Edition** and the regular (full) version of HyperWorks, please review the HyperWorks 13.0 online help documentation.

For sure, you will be amazed!