

NEi Optimization

For NEi Nastran Editor

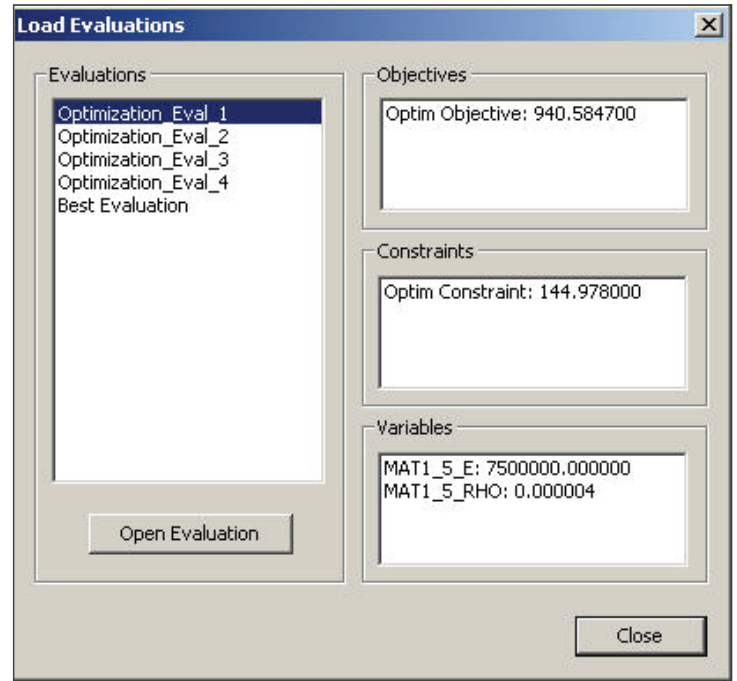
Optimizing to Save Time and Money

Using optimization during the design cycle, allows companies that are already using FEA simulation to reduce the time needed to arrive at an optimal design. Engineers can run multiple design scenarios at once and rely on the NEi Optimization engine to deliver an optimal scenario. The feature not only reduces the time needed to run each scenario early in the design phase but can also be useful in testing new product design against existing designs. This is why design optimization tools are being more widely adopted as engineers look to FEA software solutions to find ways to reduce material costs, time to market and field failures.

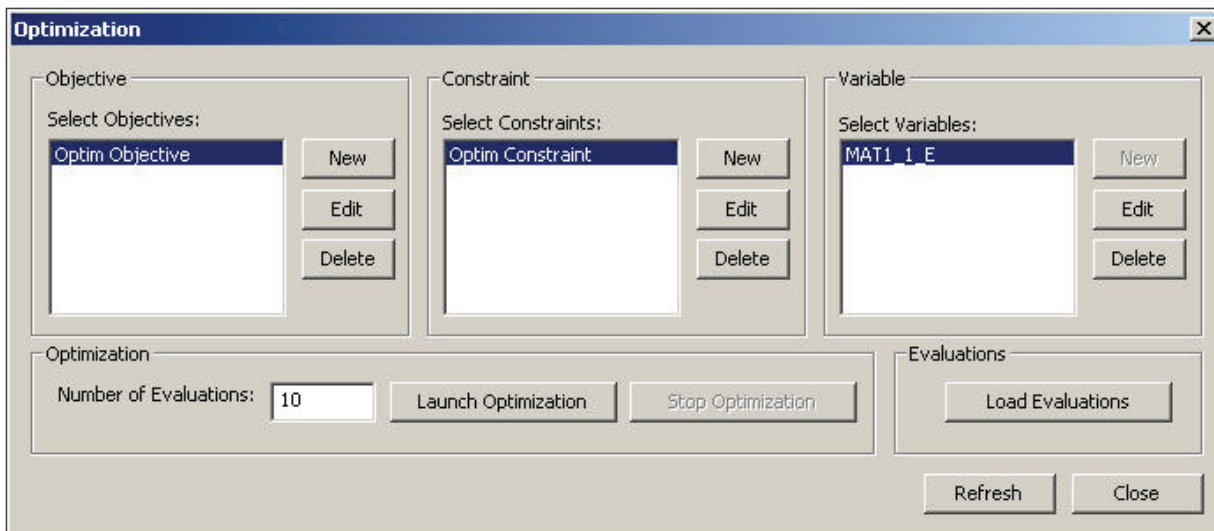
NEi Optimization allows users to perform parametric FEA analysis in order to understand the relationship between objective functions, the constraints and the myriad of design variables. Once an engineer has carefully defined the objective function and selected design constraints as well as design variables, these can be entered directly through the NEi Editor interface to obtain an optimized design solution.

NEi Editor

The NEi Nastran Editor is an industry unique tool that gives engineers greater control over their Nastran FEA models and results. The built-in optimization utility give users quick insight into the effects of design changes.



Evaluations are displayed as they are solved and stored in separate folders



The NEi Optimization interface

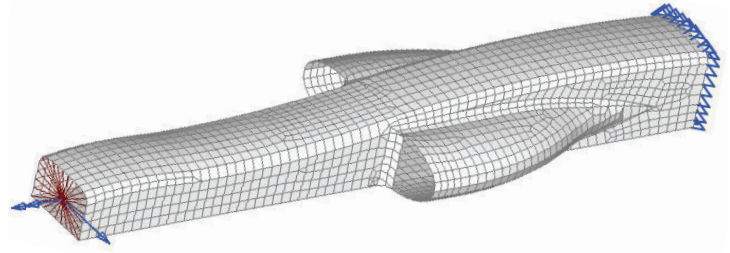
Features of NEi Optimization

1. NEi Optimization allows users to set up optimization within the bulk data file. Design objectives, constraints and variables can all be set up in a few steps within the NEi Editor.
2. Analysis progress can be monitored through a separate tab located in the NEi Editor.
3. Evaluations can be viewed as they are being solved.
4. The results of the optimal scenario are automatically saved along with the Nastran files in separate folders allowing users to simply load the results into the pre-processor to view the optimized design.
5. Multiple objective functions, constraints and design variables can be created directly in the editor. In addition to minimizing or maximizing objectives, the user can also specify target values for the solver to produce the best result.
6. Resolution can also be set up along with specifying the maximum and minimum range for the design constraints and variables.
7. NEi Optimization has the capability to set up a wide range of analyses such as static analysis and dynamics analysis to minimize weight and increase the fundamental modes of structures, or thermal analysis and buckling problems to maximize loads.

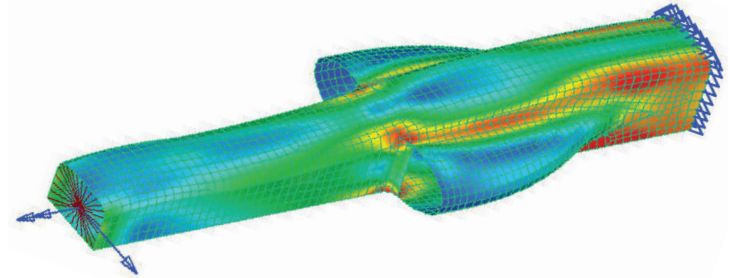
Industry Example

The racing industry is a prime example of where performance matters. With strict constraints, engineers are asked to find the best possible design in the least amount of time.

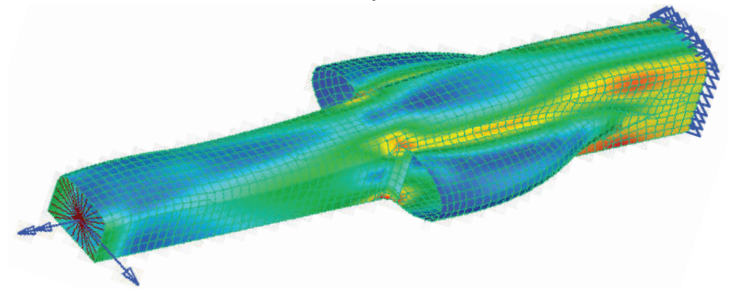
By using NEi Optimization, race teams are able to automatically reduce both weight and stress in the structure, without spending weeks of engineering time for manual redesign.



Shell representation of a racing car with force and moment applied at one end and fixed at the other end



The stress contours for a baseline study



Stress contours obtained using NEi Optimization

About NEi Software

NEi Software is a world leader in CAE innovation supplying Nastran Finite Element Analysis (FEA), engineering simulation, and virtual testing software solutions. The core product NEi Nastran is a powerful, industry-proven FEA solver that thousands of companies routinely use to perform linear and nonlinear structural stress, dynamics, and heat transfer analysis. In addition, NEi Software's portfolio includes products for impact, kinematics, fatigue, acoustics, optimization, aeroelasticity, and Computational Fluid Dynamics (CFD) with support for a full range of materials from composites to hyperelastic rubber. NEi Software covers the different needs of each stage of the product development process, from designers looking for affordable, easy-to-use, CAD-based simulation for validation and trade-off studies to dedicated FE analysts looking for high accuracy, productivity, and real world fidelity. The website features case studies in aerospace, automotive, maritime, military, civil, petroleum, medical, and consumer products with videos, webinars, tutorials, and options for evaluation.

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