



PROFESSIONAL EDITION v5.3

HEEDS Professional performs process integration and automation, multi-disciplinary design optimization, design of experiments, sensitivity studies, and reliability and robustness assessments on engineered products and processes.

Capabilities

Parameter Optimization Methods and Strategies

- SHERPA: Automated hybrid adaptive search that uses multiple search tools concurrently
- Multi-objective SHERPA (Pareto/tradeoff optimization)
- Global search methods
 - Genetic algorithm (hybrid, hierarchical, heterogeneous, mixed-variable)
 - Advanced proprietary evolutionary search algorithm
 - Simulated annealing
- Multi-start local search methods
- Surrogate-based methods (linear and quadratic response surfaces)
- User-defined methods via application programming interface (API)

Process Integration and Automation

- Direct portals to common CAE tools for data extraction
- Automated execution of multiple simulation and analysis tools within a design evaluation process
- Integration and sharing of data among separate simulations
- Support for parallel processing on networks, clusters and multiprocessors.

Design of Experiments

- Full factorial designs (2-level and 3-level)
- Fractional factorial designs (2-level and 3-level)
- Taguchi orthogonal arrays
- Plackett-Burman designs
- Latin hypercube designs
- Central composite designs
- D-optimal designs
- Taguchi robust parameter design (RPD)
- User-defined arrays
- User-defined response data

Quality Design Tools

- Taguchi robust parameter design (RPD)
- Structured sampling
- Random (Monte Carlo) sampling

Response Surfaces

- Linear and quadratic
- Multivariate adaptive regression splines (MARS)

Solution Monitoring

- Process control and run-time adjustment capability
- Real-time solution monitoring with user-controlled graphs and tables
- User-specified termination criteria

Unique Features and Capabilities

- **SHERPA: Simultaneous Hybrid Exploration that is Robust, Progressive, and Adaptive**
 - Finds better solutions the first time, identifying the best method or tuning parameters for each problem.
 - Enables non-experts to successfully apply automated optimization.
 - Performs direct optimization based on actual model evaluations, rather than using approximate response surface models.
 - Uses multiple strategies concurrently to effectively and efficiently search even the most complex design spaces.
 - Adapts itself to each problem, eliminating the need for user-specified tuning parameters.
 - Achieves both global and local search simultaneously.
- **MO-SHERPA: Multi-Objective SHERPA**
 - Performs multi-objective Pareto search using a modified version of the SHERPA algorithm.
 - Handles multiple objectives independently to provide a set of optimized solutions that represent trade-offs among the objectives.
 - Uses multiple search strategies simultaneously to more effectively explore the Pareto front.
 - Contains no tuning parameters, so non-experts can achieve success every time.

User Interface

- Intuitive graphical interface: Pre-processing, run-time monitoring, and post-processing.
- Simplified coupling of simulation and analysis tools
- Guided problem set-up procedure
- Detailed and global views of problem statement
- Platform independent

Platforms

- Windows x86-32 - Windows 2000, XP, and Vista
- Windows x86-64 - Windows XP x64 and Vista x64
- Linux x86-32 or x86-64- Red Hat Enterprise Linux v4 and 5, SuSE Linux Enterprise v9 and 10
- Contact us for a complete list of the secondary platforms that we support.