Optimize Your Product. Make The Most Profit Out Of Your CAE Investment

SmartDO was applied on the real-world industrial design since 1992. With its robust and stable optimization solver, SmartDO has been used on different physics and disciplines to optimize the design, such as

- Structure/ Crashworthiness/ CFD/ Heat Flow/ Heat Transfer
- Structural/Thermal/Electronic Coupled
- Automatic Control
- Gas Turbine Engines/ Fluid Power System/ Nuclear Energy
- Civil Structure and Resident Roof (Sizing, Shaping and Topology)
- Air Cargo Deck/ Thermoelectric Generator/ A-Arm of the Armored Tank
- Keyboard Rubber Dome/ Connectors/ Composite Structure/ Circulation Water Pump
- Wave Energy Converter/ Jet nozzle/ O-Ring Seal/ Golf Club Head
- Semi-Conductor/ Keratotomy Surgeries/ Shock Absorbing
Optimizer

- All optimizer with Global Optimization capabilities, using Direct Global Search
- Gradient-Based Direct Global Optimization
  - Tunneling and Hill Climbing
  - Local Optimizer with DV Normalized [1]
  - Conjugate Feasible Direction Method (CFDM)[1], Recursive Feasible Direction Method (RFDM)[1], Recursive Conjugate Feasible Direction Method (RCFDM)[1]
  - Smart Dynamic Search (SMDS)[1]
  - Applicable for differentiable problem. Also for both smooth problems or with noise [1,2]
- The Robust Genetic Algorithms (RGA)
  - Adaptive Penalty Function[1]
  - Automatic Schema Representation[1]
  - Automatic Population and Generation Number Calculation[1]
  - Adaptive and Automatic Cross-Over Probability Calculation[1]
  - Absolute Descent[1]
  - Concurrent Sizing, Shaping and Topology Optimization
  - Applicable for Binary(0/1) and Combinatory Optimization
  - Applicable for differentiable and non-differentiable problems
- No limitation on number of Design Variables and/or Constraints.
- Accept infeasible design for the initial design and starting points. SmartDO will resolve the infeasibility before optimization.
- Support multi-thread computation[3].

Parametric Modeling

- Modifying the parameters third party packages (CAD, CAE, CAx) without access to its source code, Generally do not need additional package or module either.

User Interface and Platform

- Main Menu : with pull-down menu interface
- Command Console : interactive command and/or batch mode
- Editor Canvas : Text editor and SmartDO specific functionality
- Control Panel : Execution flow control with visual flow charts and buttons
- Open Architecture. User-Programmable, built-in Tcl/Tk core
  - SmartScripting : Smart Tcl/Tk script generator.
  - SmartPET and PET (Preprocessor for Embedded Tcl/Tk) : Embedding Tcl/Tk scripting into any text input file on the preprocessing level
  - Supporting Objective Oriented Tcl/Tk scripting (after SmartDO verison 6)
- SmartLink : Direct link with other packages. Import the parameters of third-party packages, arbitrarily cross-link with Design Variables, Objective Function and/or Constraint in SmartDO
  - ANSYS Workbench :
  - NX CAE

NOTE
1. Proprietary algorithms.
2. Dealing with functions with local and minor to medium noise.
3. For specific software only.
Software Products and Services

- **SmartDO**: A Smart Design Optimization System and Services
- **System Integration and Design Automation**
- **CAE Analysis Consultancy Services**:
  - Structural reliability: stress, vibration, deformation, buckling, lifing/fatigue, stability, fracture mechanics, creep, plasticity, nonlinear, contact, dynamics, crashworthiness/impact.
  - Structural/heat/CFD/electrical coupled-field analysis
  - CFD/Heat Transfer/Heat Flow/Conjugate Heat Transfer

**The Virtual Lab Technology**
- Full Engine Module Fan blade-out and hub-burst simulation
- Full car crash simulation
- 3C product drop test
- Weaponery ballistic and impact analysis

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Specialized, Customized, Optimized CAE Solution Provider

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