Analyst

Full 3D Finite Element Method EM Analysis Software
Analyst™ is the arbitrary 3D finite element method (FEM) EM simulation and analysis software found within the NI AWR Design Environment platform that accelerates high-frequency product development from early physical design characterization through to full 3D EM verification. Its 3D FEM solver provides fast and accurate EM analysis so engineers can achieve higher performance in less development time for greater first-pass success.

Advantages

Diagnostics and Design
EM simulation can detect design problems that cause products to fail performance requirements. With 3D EM simulation fully integrated and readily available within an RF/microwave component design flow, designers can identify and eliminate potential failures.

Parametric Cells
Access and create libraries of parameterized EM cells for common and custom 3D interconnects and passive PCB and IC components that enable re-use. Incorporation of complex structures with a simple drag and place, captures true electrical responses throughout the design process.

Robust Solver
Analyst offers a full 3D FEM solver technology with adaptive volumetric tetrahedral meshing, direct and iterative solvers, and discrete and fast-frequency sweeps to accurately and rapidly characterize interconnect structures, dense circuitry, and antenna structures of all sizes.

“We chose NI AWR software because of the proven success of AntSyn and Analyst. The resulting designs worked from the very start and removed the iteration and experimentation usually required in antenna design efforts.”

Mark Ross, Striiv

Features at a Glance
- Layout/Drawing Editor – 2D/3D construction and views
- Proprietary FEM Full-Wave Technology
- Meshing Technology – Automatic and adaptive meshing
- Numerous Sources and Excitations for Ports
- Visualization and Results Post-Processing
- Parametric Studies – Optimization, tuning, and yield analysis
- HPC – Multi-core configurations and asynchronous simulation
Capabilities

**Design Exploration** – Automatically improve performance and mitigate design problems from unforeseen resonances and coupling between structures with 3D EM parametric studies that support optimization, tuning, and yield analysis. Spectral decomposition combine with remote computing to expedite simulation run times and provide answers faster.

**3D Modeling** – Readily characterize passive 3D components, distributed planar structures, interconnects such as vias and bond wires, complex electronic packaging, and waveguide structures directly within a circuit network. Support for 3D CAD file formats like IGES, STEP, and STL allows designers to perform EM analysis on structures from alternative CAD tools.

**Optimization and Yield** – Perform accurate design diagnostics such yield analysis and optimization for passive components and complex interconnects, capturing true coupling and parasitic effects of circuit topologies that are specified parametrically and/or defined through rules-based shape modifiers/de-featuring.

**Visualization** – Plot color-coded currents and electric field strength directly on an analyzed structure to gain insight into component behavior and the source of potential design failure.

Technologies

**Adaptive Meshing** – 3D adaptive meshing algorithms use a highly robust volumetric tetrahedron meshing technique to automatically provide accurate results with minimal setup effort or manual intervention. If necessary, user control of the mesh can be enabled for individual shape(s) using the 3D editor.

**Finite Element Analysis** – The proprietary and state-of-the-art finite element full-wave EM analysis technology within Analyst supports direct and iterative solvers, as well as discrete and fast frequency sweeps. Developed over many decades, the technology has been optimized for scalability and accuracy.

**Antenna Analysis** – Analyze 3D and 2D antennas, including patch antennas and antenna arrays on finite dielectrics, plot near- and far-field radiation patterns and simulate key antenna metrics such as gain, directivity, efficiency, side-lobes, return loss, surface currents, and more.
Services and Support

**Technical Support**
Get started faster or work through tough issues by contacting NI AWR software support engineers who are ready to help via phone and email during normal business hours.

**Technical Resources**
Access volumes of self-help information at awrcorp.com/support-resources, including application tips, example projects, user forum, and more.

**Online Training**
Get a jump start with self-paced modular training videos on awrcorp.com/elearning that aim to educate new users on NI AWR software.

**Academic Resources**
NI AWR software donations are available to support academic institutions with an emphasis on teaching and/or non-proprietary research.

Learn more at ni.com/awr