



CATALOG

ALTAIR



ONLY FOWARD

ALTAIR

ABOUT US

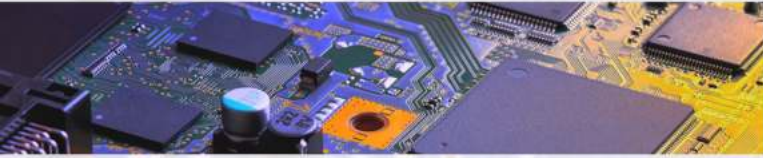
Altair is a global technology company that provides software and cloud solutions in the areas of product development, high performance computing (HPC) and data analytics. Altair enables organizations across broad industry segments to compete more effectively in a connected world while creating a more sustainable future.



ALTAIR

CHANNEL PARTNER

PRODUCTS



ELECTRONIC SYSTEM DESIGN

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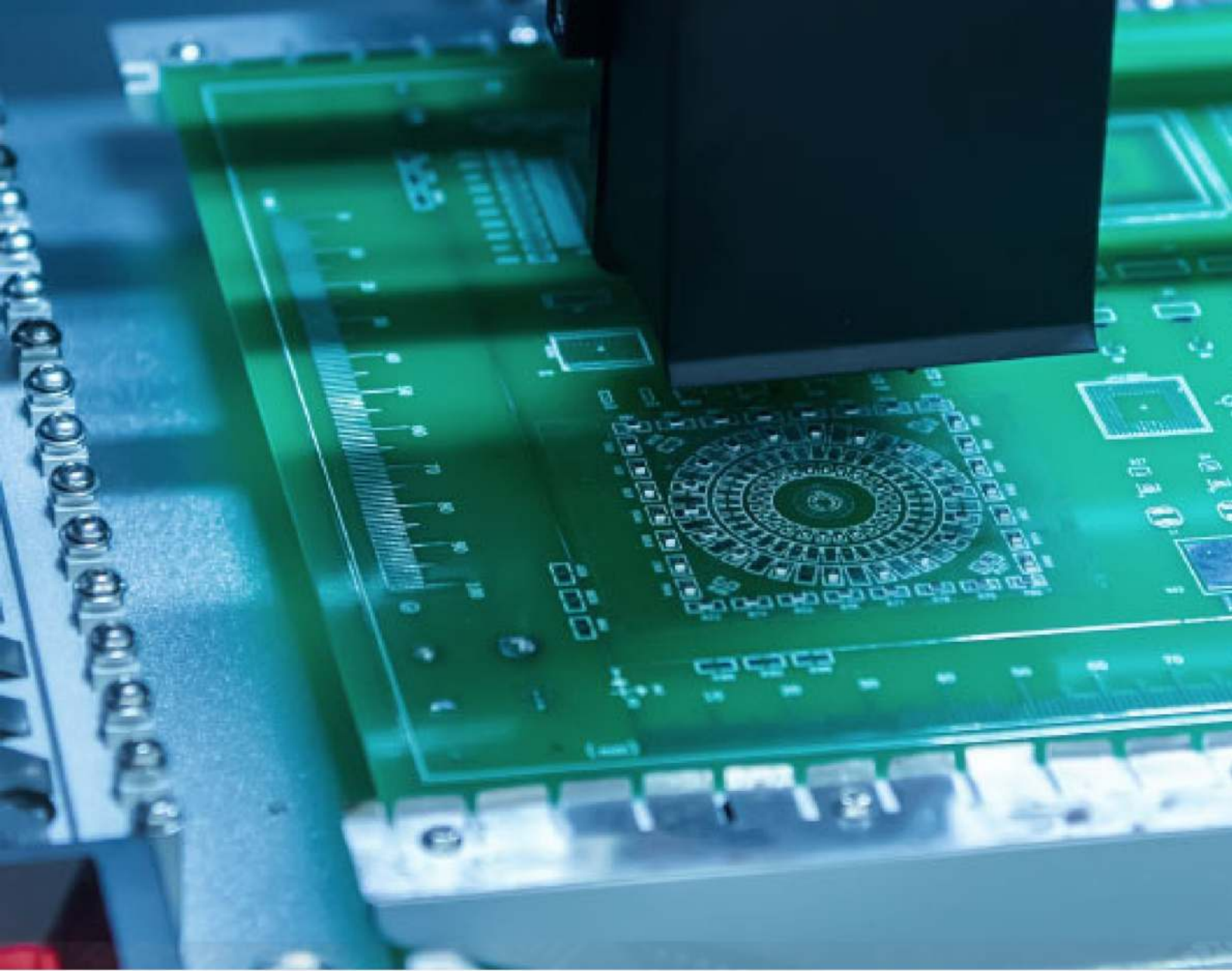


HIGH-PERFORMANCE COMPUTER & CLOUD

PAGE 40

ELECTRONIC SYSTEM DESIGN (ESD)

Smart connected devices are everywhere, in homes, in transportation, and at work. This means electronic system design (ESD) is having a greater influence on almost every type of product requiring new simulation tools to help achieve electronic, electrical, mechanical, thermal, and connectivity goals. Altair's simulation-driven design tools enable your team of specialized engineers to collaborate across all aspects of printed circuit board development from concept to manufacturing. Our products streamline your process, eliminate design iterations, and reduce time-to-market.

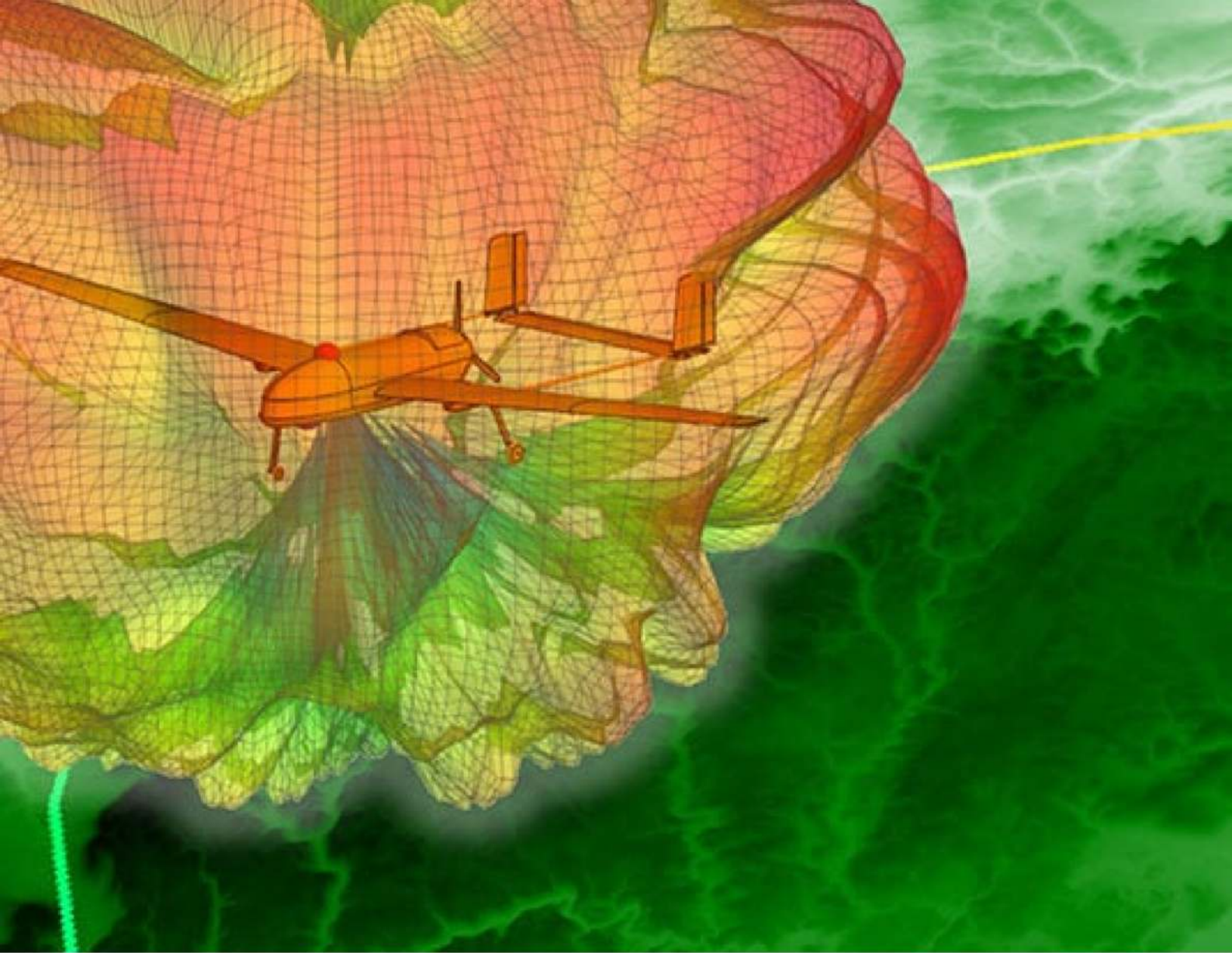


ALTAIR POLLEX

Integrated EDA Software for PCB Design

ALTAIR POLLEX IS THE MOST COMPREHENSIVE AND INTEGRATED SET OF PCB DESIGN VIEWING, ANALYSIS AND VERIFICATION TOOLS IN THE MARKET FOR ELECTRICAL, ELECTRONICS AND MANUFACTURING ENGINEERS. POLLEX IS AN OPEN SOLUTION, WHICH TRANSFERS DATA FLAWLESSLY BETWEEN DIFFERENT ECAD AND SIMULATION ENVIRONMENTS.

- PCB MODELER TO QUICKLY VIEW AND EXPLORE DESIGN
- INVESTIGATE PCB SIGNAL INTEGRITY (SI) AND THERMAL PROBLEM
- POWERFUL SET OF PCB DESIGN VERIFICATION TOOLS



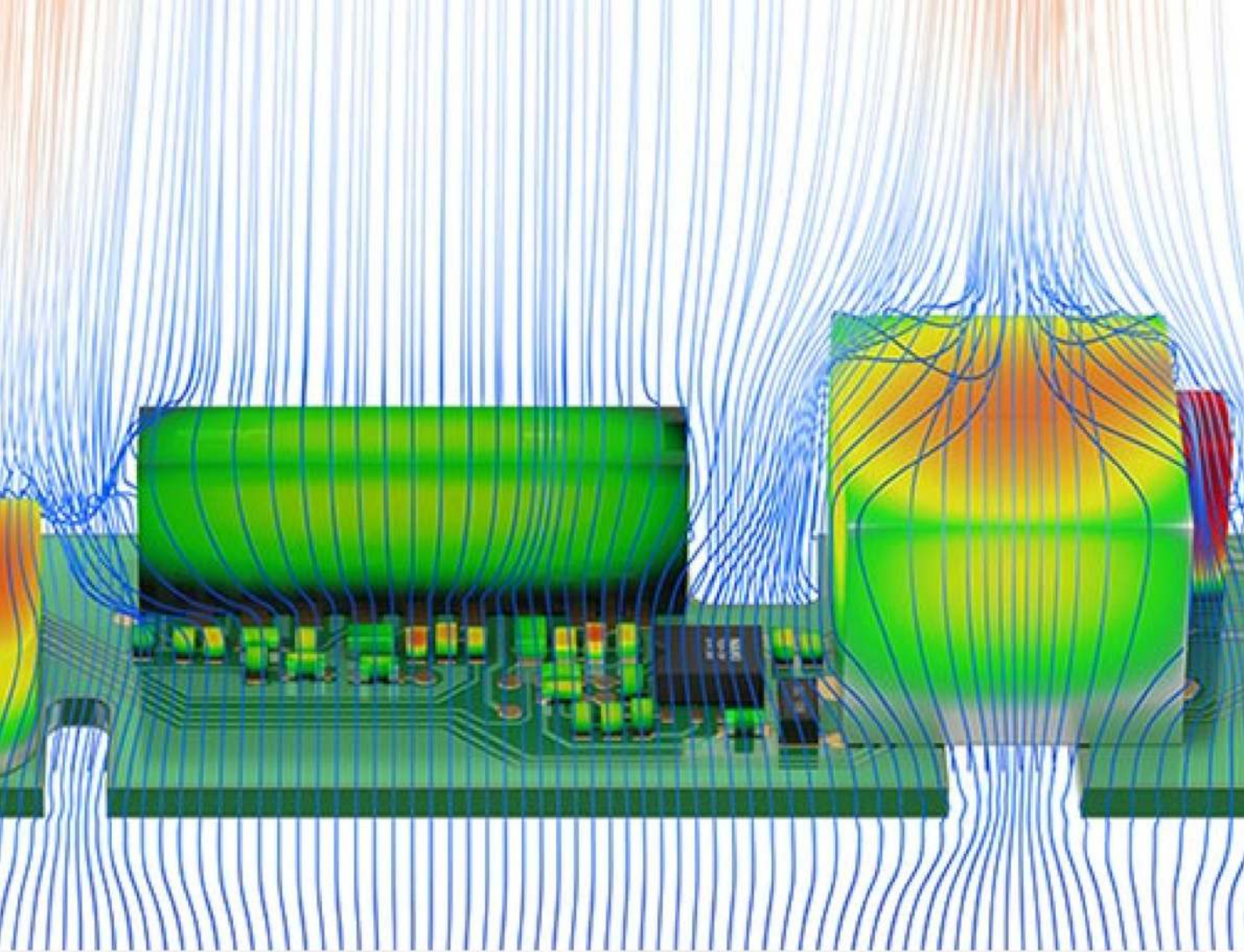
ALTAIR FEKO

High frequency EMag & Antenna Design

FEKO IS A LEADING ELECTROMAGNETIC SIMULATION SOFTWARE THAT USES MULTIPLE FREQUENCY AND TIME DOMAIN TECHNIQUES.

TRUE HYBRIDIZATION ENABLES THE EFFICIENT ANALYSIS OF A BROAD SPECTRUM OF EM PROBLEMS MAINLY RELATED TO ANTENNA DESIGN AND PLACEMENT, SCATTERING, RADAR CROSS SECTION (RCS) AND ELECTROMAGNETIC COMPATIBILITY (EMC).

- ONE PRODUCT, MULTIPLE SOLVERS
- SUPERIOR SOLVER ACCURACY AND PERFORMANCE
- SPECIALIZED SOLUTIONS



ALTAIR SIMLAB

Multiphysics Workflows with CAD Associativity

SIMLAB IS A PROCESS-ORIENTED MULTIDISCIPLINARY SIMULATION ENVIRONMENT TO ACCURATELY ANALYSE THE PERFORMANCE OF COMPLEX ASSEMBLIES. MULTIPLE PHYSICS INCLUDING STRUCTURAL, THERMAL, E-MAG, AND FLUID DYNAMICS CAN BE EASILY SETUP USING HIGHLY AUTOMATED MODELING TASKS, HELPING TO DRASTICALLY REDUCE THE TIME SPENT CREATING FINITE ELEMENT MODELS AND INTERPRETING RESULTS.

- HIGHLY EFFICIENT, FEATURE-BASED MODELING APPROACH
 - CREATE TEMPLATES TO ENABLE CAE AUTOMATION
 - MULTIPHYSICS ANALYSES LOCALLY OR IN THE CLOUD



ALTAIR FLUX

Electromagnetic, Electric, & Thermal Analysis

FLUX CAPTURES THE COMPLEXITY OF ELECTROMECHANICAL EQUIPMENT TO OPTIMIZE THEIR PERFORMANCE, EFFICIENCY, DIMENSIONS, COST OR WEIGHT WITH PRECISION, BRINGING BETTER INNOVATION AND VALUE PRODUCTS TO END USERS.

FLUX SIMULATES MAGNETO STATIC, STEADY-STATE AND TRANSIENT CONDITIONS, ALONG WITH ELECTRICAL AND THERMAL PROPERTIES.

- FLEXIBLE, OPEN ENVIRONMENT – SCRIPTING, MACROS, ETC.
- PROVEN ACCURACY VALIDATED BY MEASUREMENTS
- MULTIPHYSICS CAPABILITIES FOR PERFORMANCE OPTIMIZATION



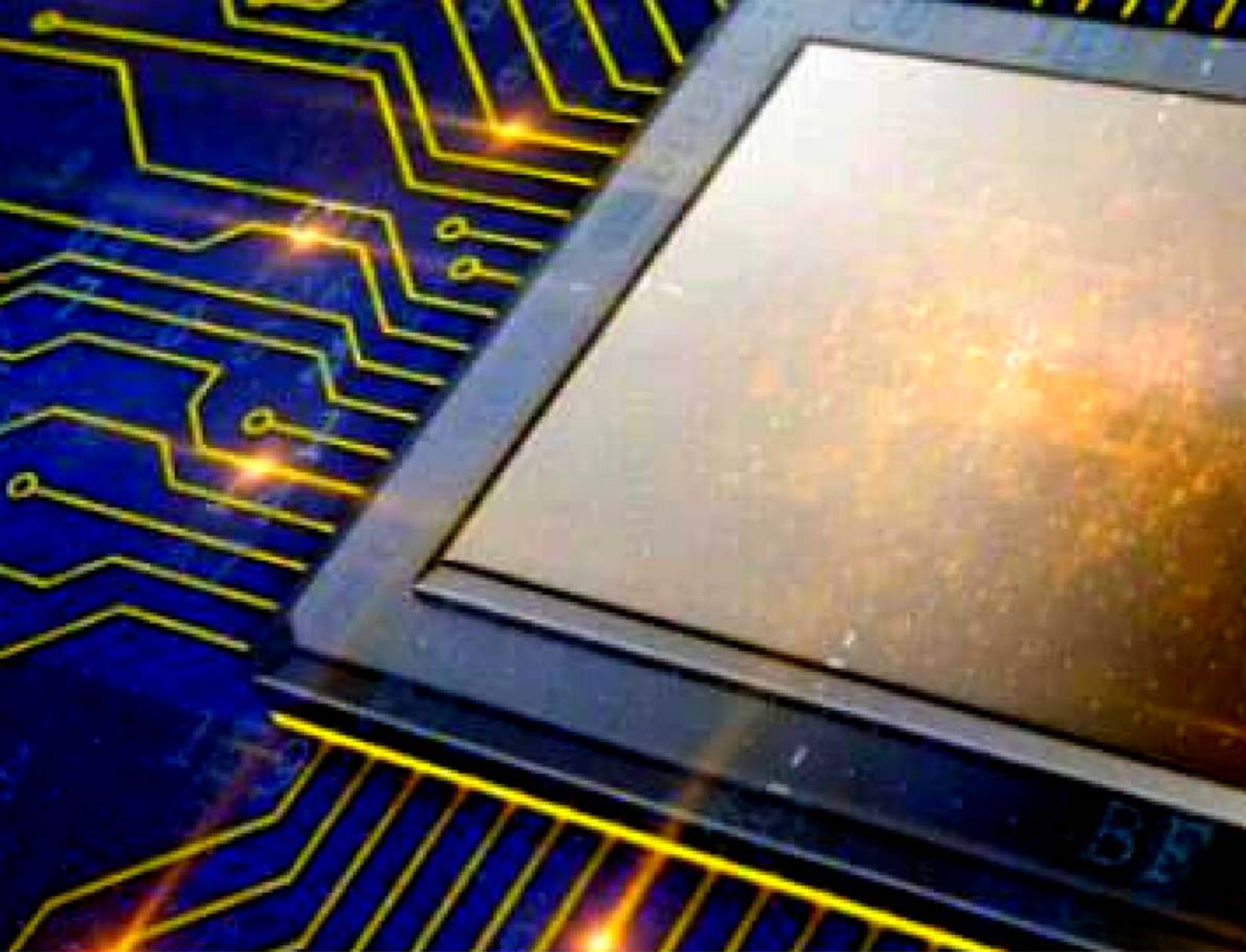
ALTAIR EMBED

Visual Environment for Embedded System

EMBED IS A PROVEN TOOL FOR DEVELOPING EMBEDDED SYSTEMS, BY AUTOMATICALLY GENERATING CODE FROM BLOCK DIAGRAM MODELS AND TRANSFERRING TO POPULAR CONTROLLER HARDWARE. ONCE YOU HAVE A WORKING SIMULATION BASED ON A SYSTEM DIAGRAM, AUTOMATICALLY GENERATE THE ASSOCIATED CODE FOR YOUR HARDWARE CONTROLLER.

YOU CAN ALSO READILY TEST YOUR DESIGN USING HARDWARE-IN-THE-LOOP (HIL).

AUTOMATICALLY GENERATE CODE DIRECTLY FROM SYSTEM DIAGRAMS
EFFICIENT CODE PRODUCES HIGH QUALITY RESULTS RAPIDLY
ROBUST AND RELIABLE PROCESS, NO NEED TO EDIT



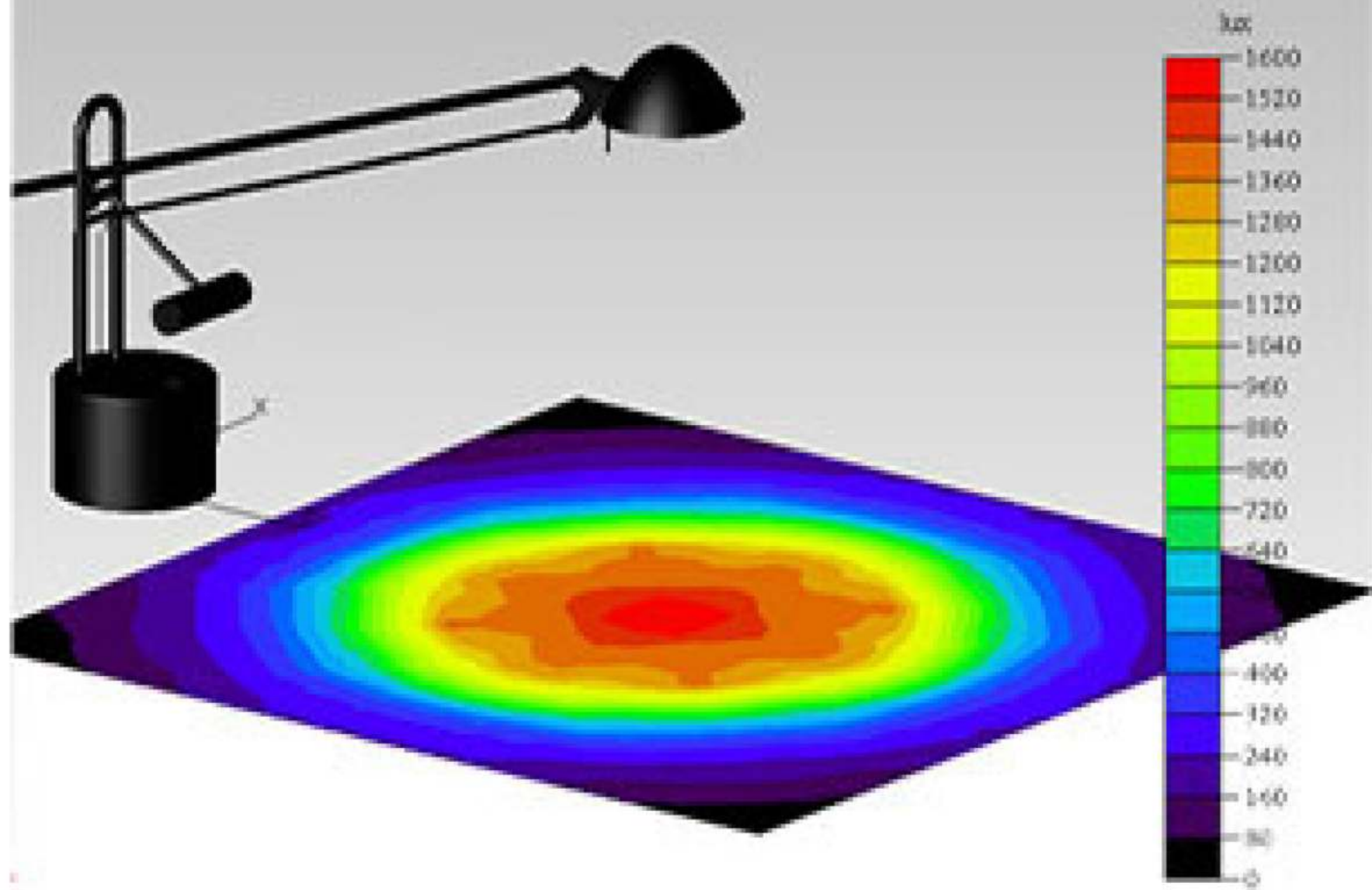
ALTAIR ACCELERATOR

High throughput Enterprise Job Scheduling

ACCELERATOR IS A HIGH-THROUGHPUT, ENTERPRISE-GRADE JOB SCHEDULER DESIGNED TO MEET THE COMPLEX DEMANDS OF SEMICONDUCTOR AND ELECTRONIC DESIGN AUTOMATION (EDA) AND HIGH-PERFORMANCE COMPUTING (HPC).

IT'S A HIGHLY ADAPTABLE SOLUTION CAPABLE OF MANAGING COMPUTE INFRASTRUCTURES FROM SMALL, DEDICATED SERVER FARMS TO COMPLEX, DISTRIBUTED HPC AND CLUSTER ENVIRONMENTS.

- SUB-MILLISECOND LATENCY FOR BEST PERFORMANCE AND UX
- SCALABLE, SMALL-FOOTPRINT ARCHITECTURE
- CAPABLE OF SCHEDULING MILLIONS OF JOBS PER DAY

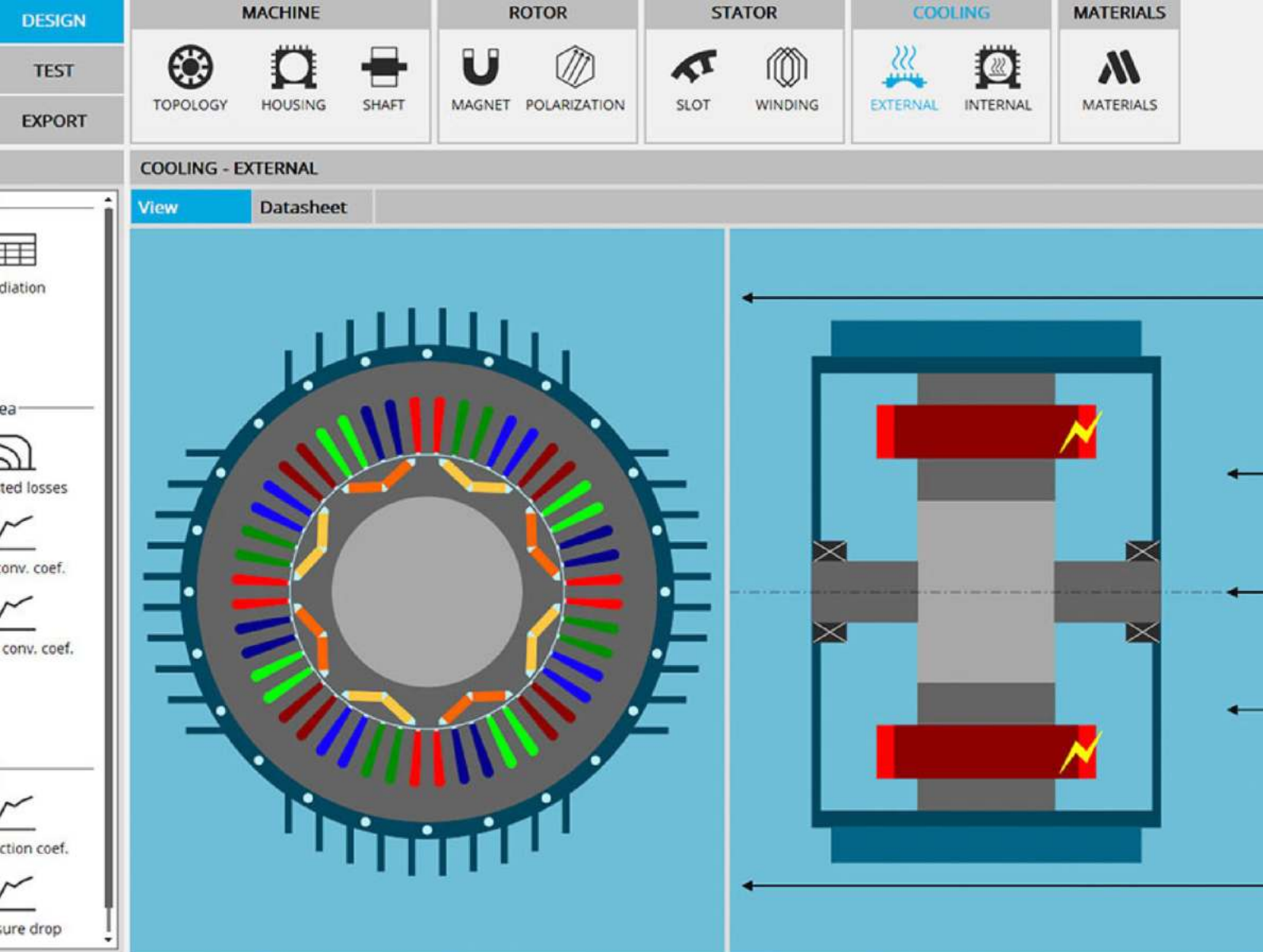


TRACEPRO

Software for Design, Analysis, and Simulation of Illumination and Optical Systems

OPTICAL MODELING FOR LIFE SCIENCE RESEARCH REQUIRES AN EXTRAORDINARY DEGREE OF INTERDISCIPLINARY COLLABORATION AMONG MEDICAL DOCTORS, LIFE SCIENTISTS, AND BIOMEDICAL DESIGN ENGINEERS.

- INTUITIVEMODELINGENVIRONMENT
- COLLABORATION-ENHANCINGFEATURES
- FULLSPECTRUMANALYTICALCAPABILITIES •
- REALANDSIMULATEDSPECIMENS



ALTAIR FLUXMOTOR

Electric Rotating Motor Design

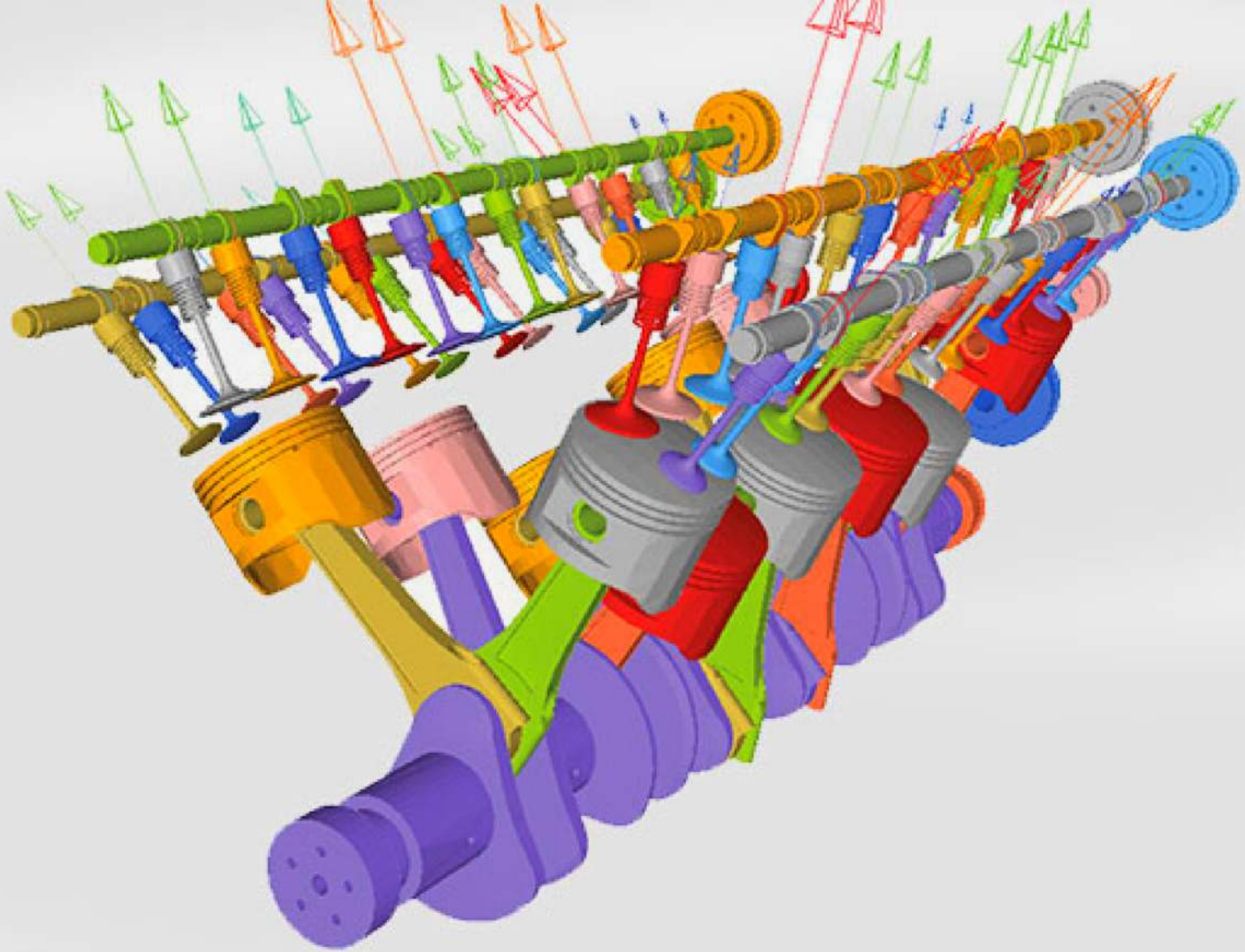
FLUXMOTOR IS A FLEXIBLE OPEN SOFTWARE TOOL DEDICATED TO THE PRE-DESIGN OF ELECTRIC ROTATING MACHINES.

IT ENABLES THE USER TO BUILD A MACHINE FROM STANDARD OR CUSTOMIZED PARTS, ADD WINDINGS AND MATERIALS TO RUN A SELECTION OF TESTS AND COMPARE RESULTS.

- MOTOR-DEDICATED AND INTUITIVE INTERFACE
- TRUSTWORTHY RESULTS BASED ON FLUX FINITE ELEMENT SOLVER
- QUICKLY DESIGN AND OPTIMIZE CONCEPT MACHINES

MULTIPHYSICS

Altair provides an industry-leading portfolio of multiphysics-enabled software to simulate a wide range of interacting physical models including fluid-structure interaction (FSI), flexible bodies, aeroacoustics, and thermomechanical simulation. Together with Altair's multidisciplinary optimization and scalable high-performance computing (HPC) you can solve real world engineering problems quickly and effectively.



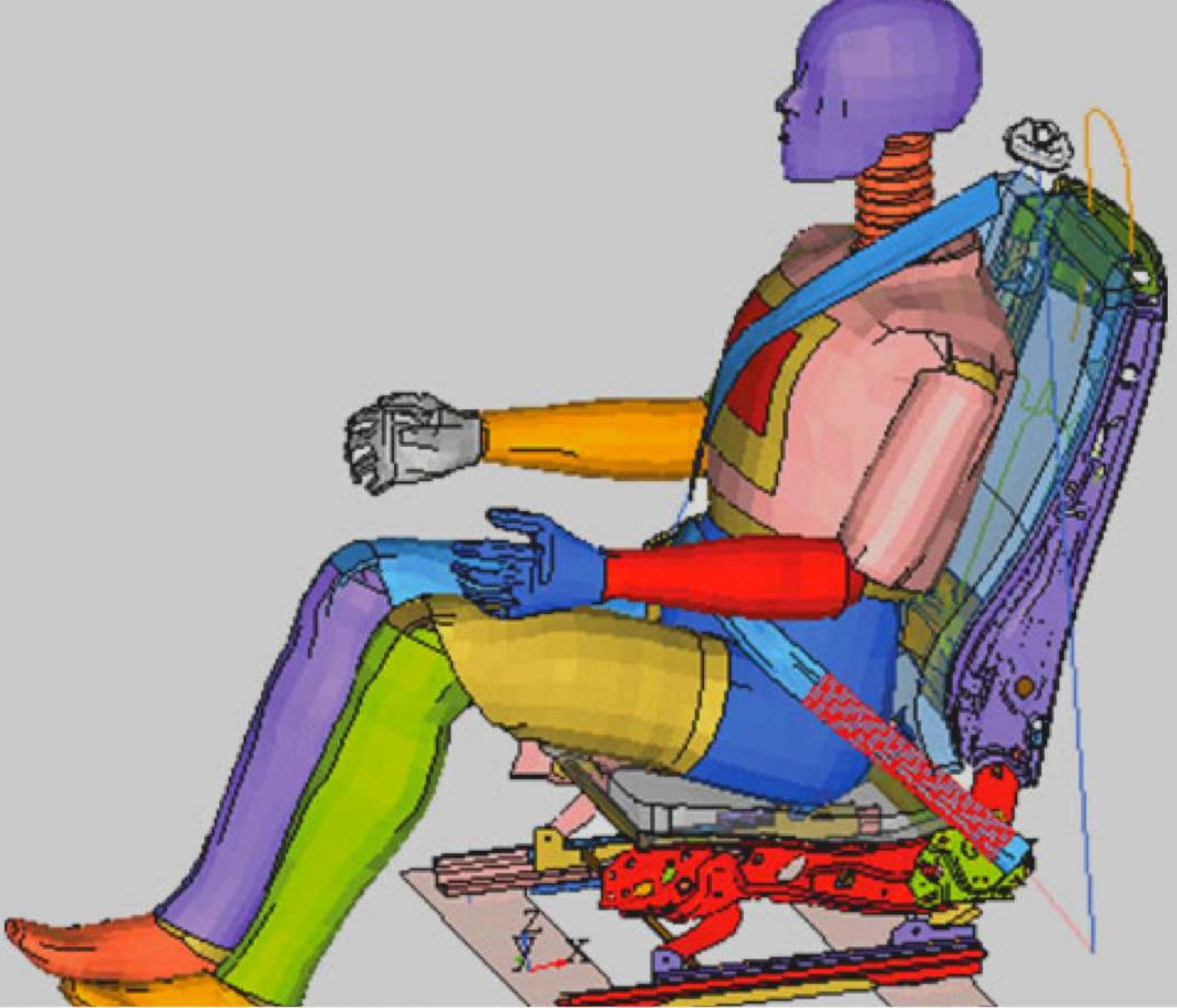
ALTAIR MOTIONSOLVE

Multi body System Simulation

MOTIONSOLVE PERFORMS 3D MULTI-BODY SYSTEM SIMULATIONS TO PREDICT THE DYNAMIC RESPONSE AND OPTIMIZE THE PERFORMANCE OF PRODUCTS THAT MOVE.

BY CONSIDERING REALISTIC MOTION-INDUCED LOADS AND ENVIRONMENTAL EFFECTS, ENGINEERS AND DESIGNERS CAN BE CONFIDENT THAT THEIR PRODUCTS, WHEN MADE AND OPERATED, WILL PERFORM RELIABLY, MEET DURABILITY REQUIREMENTS, AND NOT VIBRATE EXCESSIVELY OR FAIL FROM FATIGUE.

- ENSURE DESIRED SYSTEM PERFORMANCE
- ACCELERATE VEHICLE DEVELOPMENT
- UNDERSTAND AND IMPROVE REAL-WORLD SYSTEMS



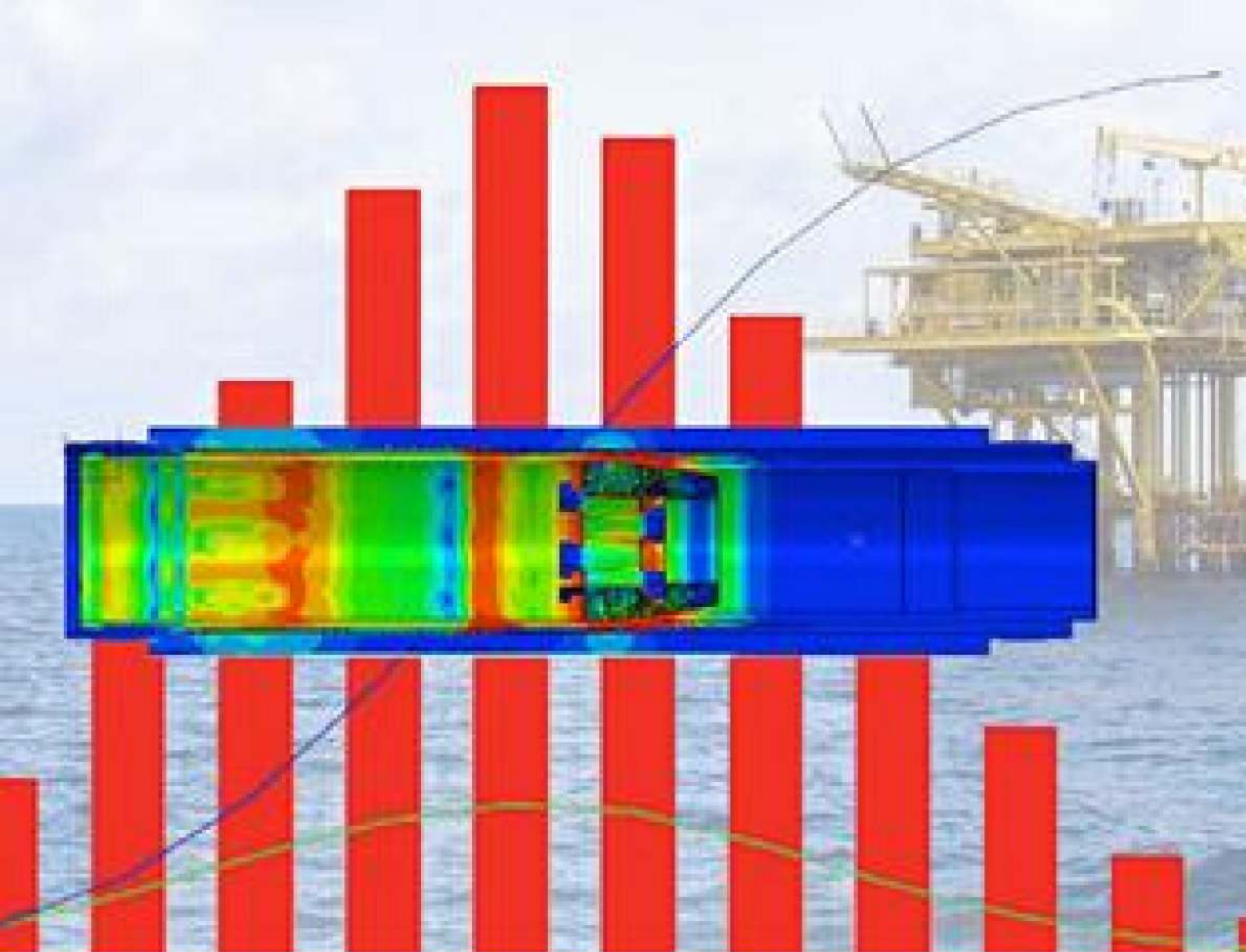
HYPERSTUDY

Multi disciplinary Design Exploration

HYPERSTUDY IS A MULTI-DISCIPLINARY DESIGN EXPLORATION, STUDY, AND OPTIMIZATION SOFTWARE FOR ENGINEERS AND DESIGNERS. USING DESIGN-OF-EXPERIMENTS, METAMODELING, AND OPTIMIZATION METHODS, HYPERSTUDY CREATES INTELLIGENT DESIGN VARIANTS, MANAGES RUNS, AND COLLECTS DATA.

USERS ARE GUIDED TO UNDERSTAND DATA TRENDS, PERFORM TRADE-OFF STUDIES, AND OPTIMIZE DESIGN PERFORMANCE AND RELIABILITY.

- DESIGN EXPLORATION, METAMODELING, AND OPTIMIZATION
- DATA MINING TOOLS THAT ARE EASY TO UNDERSTAND
- DIRECT INTERFACE TO THE MOST POPULAR CAE SOLVERS

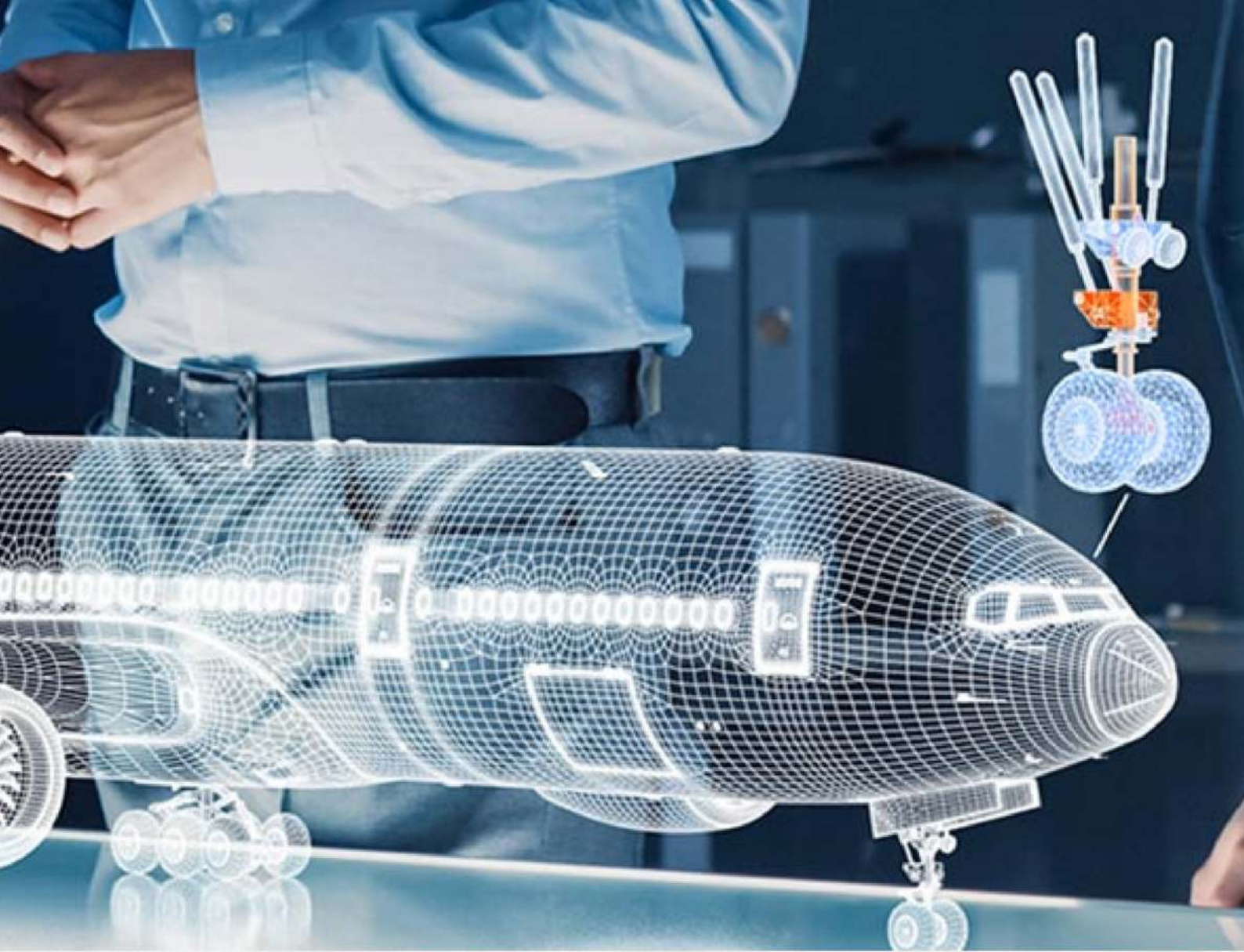


HYPERWORKS

High fidelity Finite Element Modeling

HYPERWORKS PROVIDES EASY-TO-LEARN, EFFECTIVE WORKFLOWS THAT LEVERAGE DOMAIN KNOWLEDGE AND INCREASE TEAM PRODUCTIVITY, ENABLING THE EFFICIENT DEVELOPMENT OF TODAY'S INCREASINGLY COMPLEX AND CONNECTED PRODUCTS.

- FASTER PRODUCT DEVELOPMENT
- GREATER MULTI-DISCIPLINARY COLLABORATION
- ACCURATE MODELLING OF MORE DESIGN ALTERNATIVES



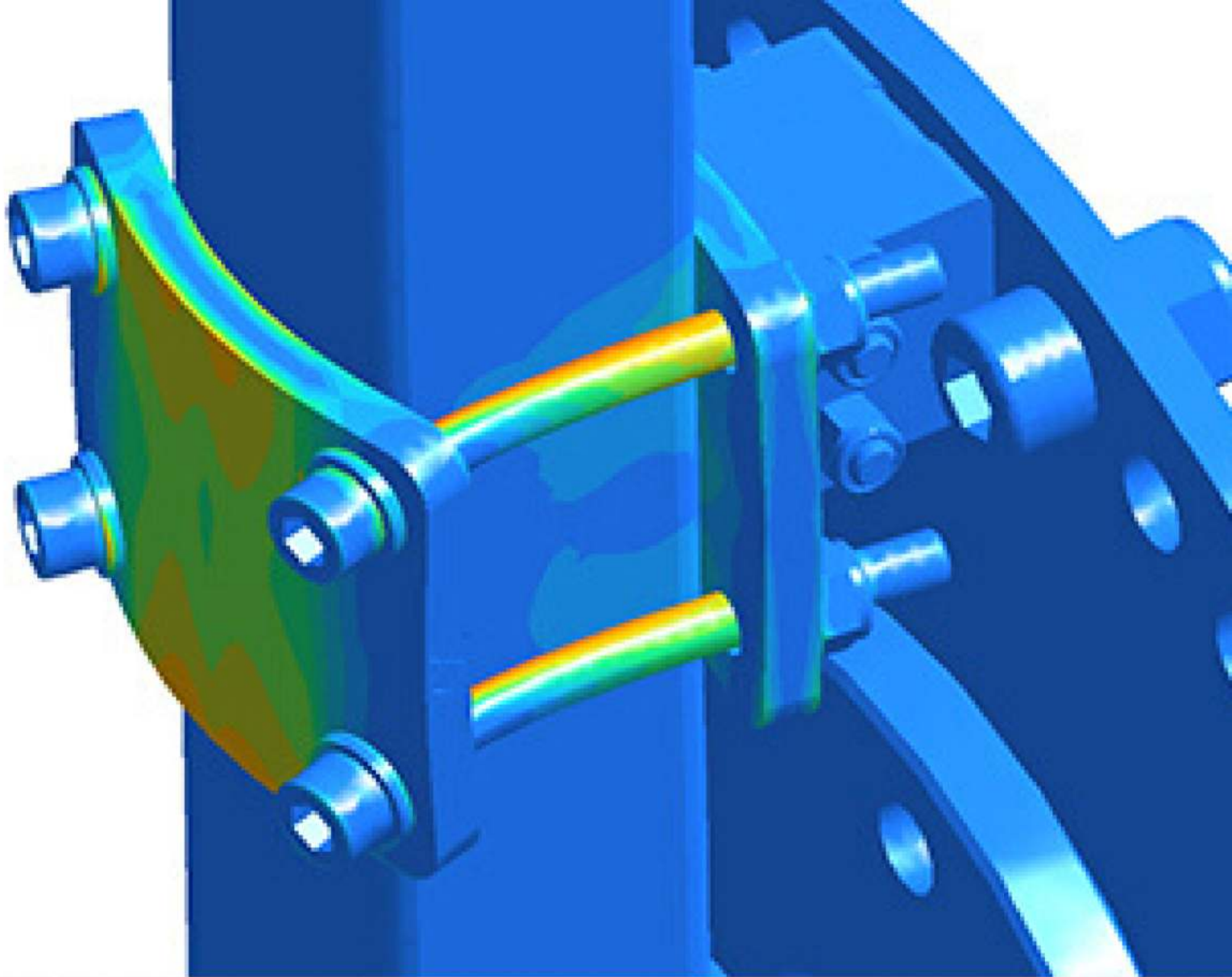
ALTAIR OPTISTRUCT

Optimization enabled Structural Analysis

BUILDING ON OVER 25-YEARS OF INNOVATION, OPTISTRUCT IS A PROVEN, MODERN STRUCTURAL SOLVER WITH COMPREHENSIVE, ACCURATE AND SCALABLE SOLUTIONS FOR LINEAR AND NONLINEAR ANALYSES ACROSS STATICS AND DYNAMICS, VIBRATIONS, ACOUSTICS, FATIGUE AND MULTIPHYSICS DISCIPLINES.

OPTISTRUCT SOLVES BOTH LINEAR AND NONLINEAR PROBLEMS USING AN ENHANCED PROPRIETARY VERSION OF NASTRAN AND A MODERN PROPRIETARY NONLINEAR FORMULATION DEVELOPED AND MAINTAINED BY ALTAIR.

- COMPREHENSIVE ANALYSIS SOLUTIONS
 - INDUSTRY LEADING OPTIMIZATION
- SINGLE MODEL, MULTI-ATTRIBUTE WORKFLOW



ALTAIR SIMSOLID

Structural Analysis for Rapid Design Iterations

SIMSOLID IS A STRUCTURAL ANALYSIS SOFTWARE DEVELOPED SPECIFICALLY FOR RAPIDLY EVOLVING DESIGN PROCESSES.

IT ELIMINATES GEOMETRY SIMPLIFICATION AND MESHING, THE TWO MOST TIME-CONSUMING AND EXPERTISE-EXTENSIVE TASKS DONE IN TRADITIONAL FEA, ENABLING THE ANALYSIS OF FULLY-FEATURED CAD ASSEMBLIES IN SECONDS TO MINUTES.

- STRUCTURAL ANALYSIS ON A CAD WORKSTATION EVEN FOR LARGE AND COMPLEX PARTS AND ASSEMBLIES
- FAST MODEL SETUP WITH FULLY FEATURED CAD, EVEN WITH EARLY OR IMPERFECT GEOMETRY
- CAD ASSOCIATIVITY ENABLES RAPID DESIGN ITERATIONS

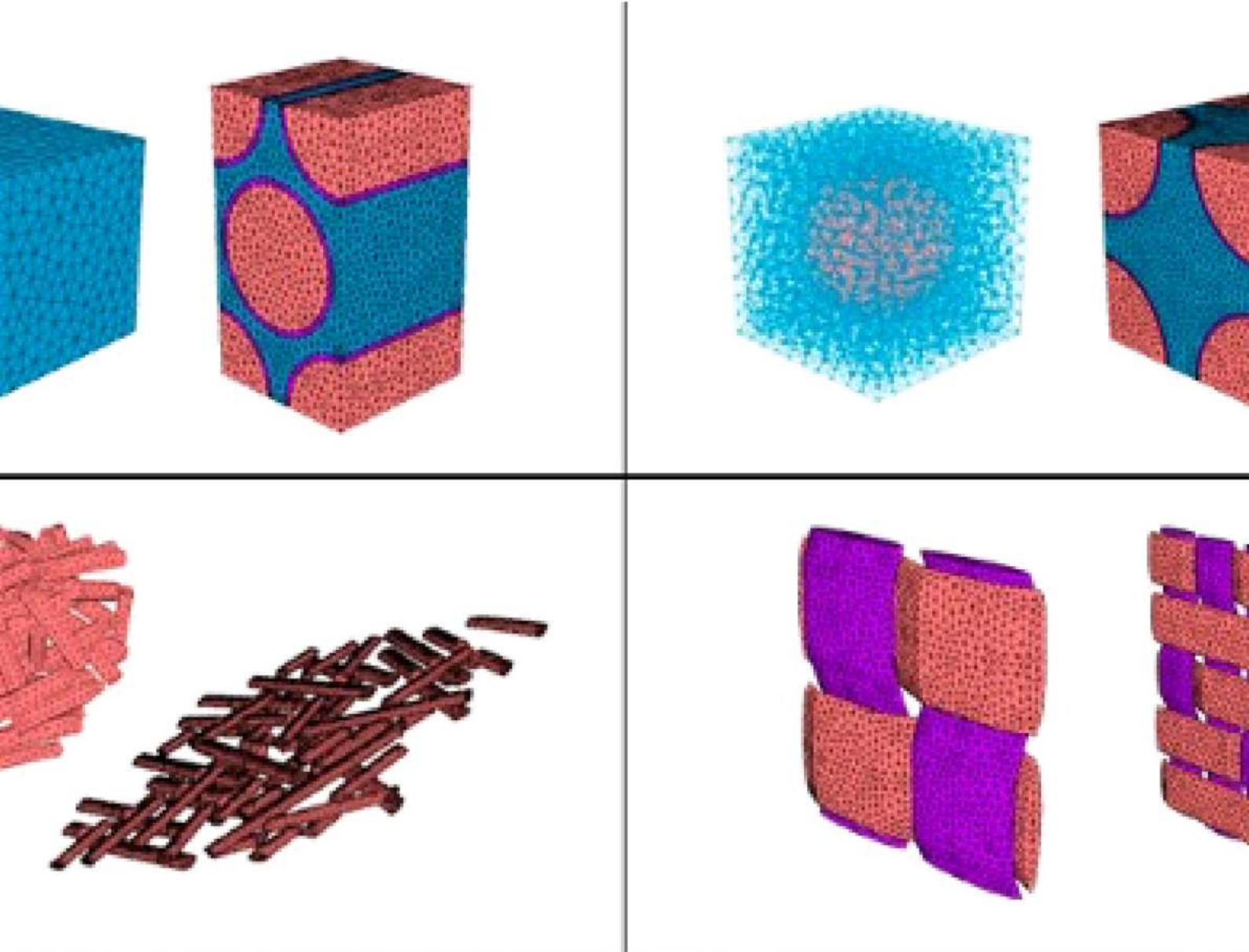


IRAZU

2D/3D Geomechanical Simulation Software

IRAZU IS A VERSATILE 2D/3D FINITE-DISCRETE ELEMENT SOFTWARE PACKAGE FOR THE ANALYSIS OF LARGE DEFORMATIONS, FRACTURING, AND STABILITY IN ROCK MASSES.

THE INTEGRATION OF VARIOUS MULTIPHYSICS SOLVERS AND ADVANCED FEATURES INTO A SINGLE SOFTWARE PACKAGE ENABLES IRAZU TO BE USED FOR A WIDE RANGE OF ENGINEERING APPLICATIONS, INCLUDING BUT NOT LIMITED TO EXCAVATIONS, SLOPE STABILITY, TUNNELING, DYNAMIC ANALYSIS, MINING, AND RESERVOIR GEOMECHANICS. IRAZU COMES WITH EXTENSIVE TUTORIAL, THEORY, AND VERIFICATION MANUALS.



ALTAIR MULTISCALE DESIGNER

Multiscale Material Modeling & Simulation

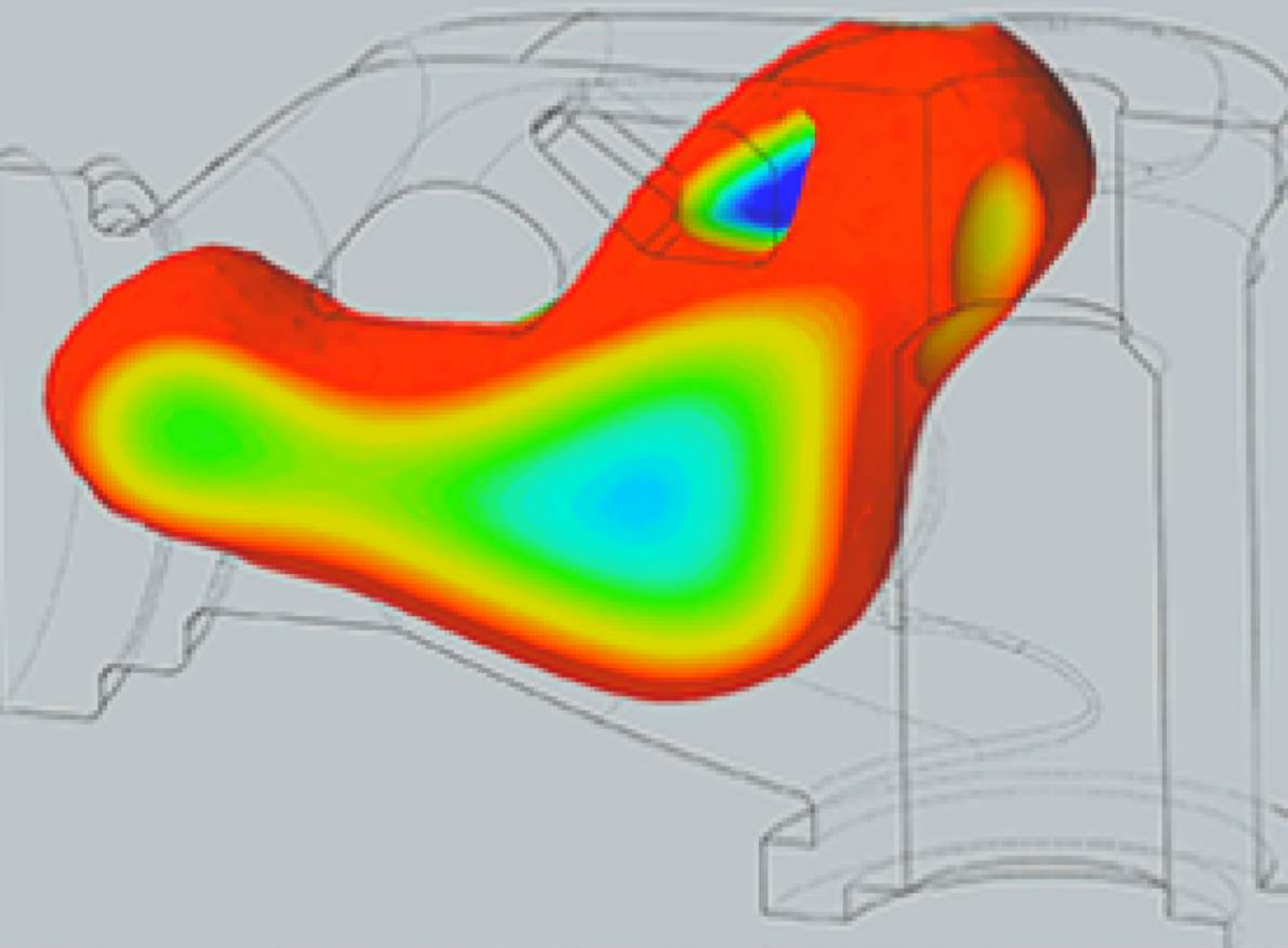
MULTISCALE MATERIAL MODELING IS A POWERFUL METHOD TO GAIN INSIGHTS INTO ADVANCED MATERIAL BEHAVIOR. ESPECIALLY FOR COMPOSITE MATERIALS, MULTISCALE IS AN ACCEPTED, ESSENTIAL APPROACH FOR PREDICTING MATERIAL PROPERTIES ACCURATELY AND EFFICIENTLY FOR USE IN STRUCTURAL SIMULATIONS.

MULTISCALE DESIGNER'S MATERIAL MODELS CAN BE USED IN IMPLICIT AND EXPLICIT ANALYSES WITHIN THE MOST POPULAR COMMERCIALY AVAILABLE SOLVERS, AND SUPPORT HARDWARE PARALLELIZATION ON DIFFERENT PLATFORMS.

- IMPROVE THE COMPOSITE DESIGN PROCESS
- PERFORM MORE RELIABLE COMPOSITE SIMULATIONS
- GET ACCURATE AND COMPLETE MATERIAL DATA FOR SIMULATION

INDUSTRIAL DESIGN APPLICATIONS

Altair's industrial design tools allow designers, architects, and digital artists to create, evaluate, and visualize their vision faster than ever before. Focus on ideas instead of being hindered by shortcomings of the software tools and liberate creativity with design software that lets the user model freely, make changes effortlessly, and render beautifully.



INSPIRE

Accelerate Simulation driven Design

APPLIED EARLY IN THE PRODUCT DEVELOPMENT LIFECYCLE, ALTAIR INSPIRE ACCELERATES THE CREATION, OPTIMIZATION, AND STUDY OF INNOVATIVE, STRUCTURALLY EFFICIENT PARTS AND ASSEMBLIES THROUGH COLLABORATION.

INSPIRE ENABLES BOTH SIMULATION ANALYSTS AND DESIGNERS TO PERFORM WHAT-IF STUDIES FASTER, EASIER, AND ABOVE ALL EARLIER, ENCOURAGING COLLABORATION AND REDUCING PRODUCT TIME TO MARKET.

- CREATE AND MODIFY DESIGNS WITH EASE
- OPTIMIZE FOR MANUFACTURABILITY
- SIMULATE AT THE SPEED OF DESIGN



ALTAIR INSPIRE FORM

Metal Forming Process Simulation

ALTAIR INSPIRE FORM IS A COMPLETE STAMPING SIMULATION ENVIRONMENT THAT CAN EFFECTIVELY BE USED BY PRODUCT DESIGNERS AND PROCESS ENGINEERS TO OPTIMIZE DESIGNS, SIMULATE ROBUST MANUFACTURING AND REDUCE MATERIAL COSTS.

IT ALLOWS TO IDENTIFY DEFECTS EARLY IN THE PRODUCT DEVELOPMENT PHASE, ACCELERATE DIE FACE DESIGN, AND PROVIDE ACCURATE INSIGHTS ON PRODUCT FORMABILITY, PROCESS PARAMETERS AND MATERIAL UTILIZATION.

- PRODUCT DESIGN, FEASIBILITY ANALYSIS AND COST ESTIMATION
- EASY TO USE, NATURAL AND PROCESS-DRIVEN WORKFLOWS
- ACCURATE MULTI-STAGE VIRTUAL TRY-OUT MODULE



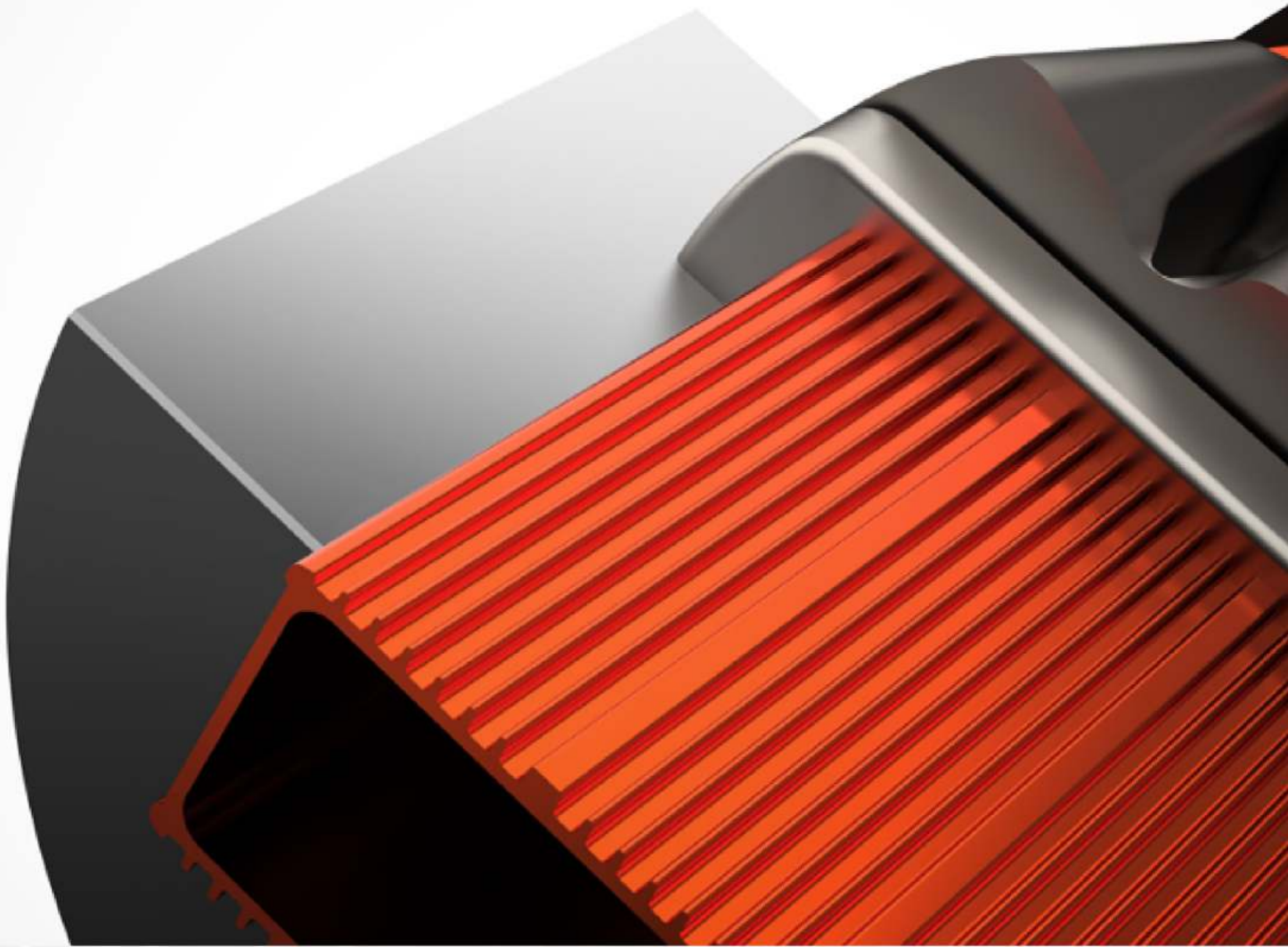
INSPIRE STUDIO

All-in-one Industrial Design Solution

INSPIRE STUDIO IS THE NEW SOLUTION FOR INNOVATIVE DESIGNERS, ARCHITECTS, AND DIGITAL ARTISTS TO CREATE, EVALUATE AND VISUALIZE DESIGNS FASTER THAN EVER BEFORE.

WITH UNRIVALED FLEXIBILITY AND PRECISION, ITS UNIQUE CONSTRUCTION HISTORY FEATURE ALONG WITH MULTIPLE MODELLING TECHNIQUES EMPOWERS USERS THROUGHOUT THE CREATIVE PROCESS.

- ENHANCE CREATIVITY BY LETTING DESIGNERS DRIVE THEIR DESIGN
- MIX AND MATCH MODELLING TECHNIQUES
- CREATE STUNNING IMAGES AND COMPLEX ANIMATIONS



ALTAIR INSPIRE EXTRUDE

Metal and Polymer Extrusion Process

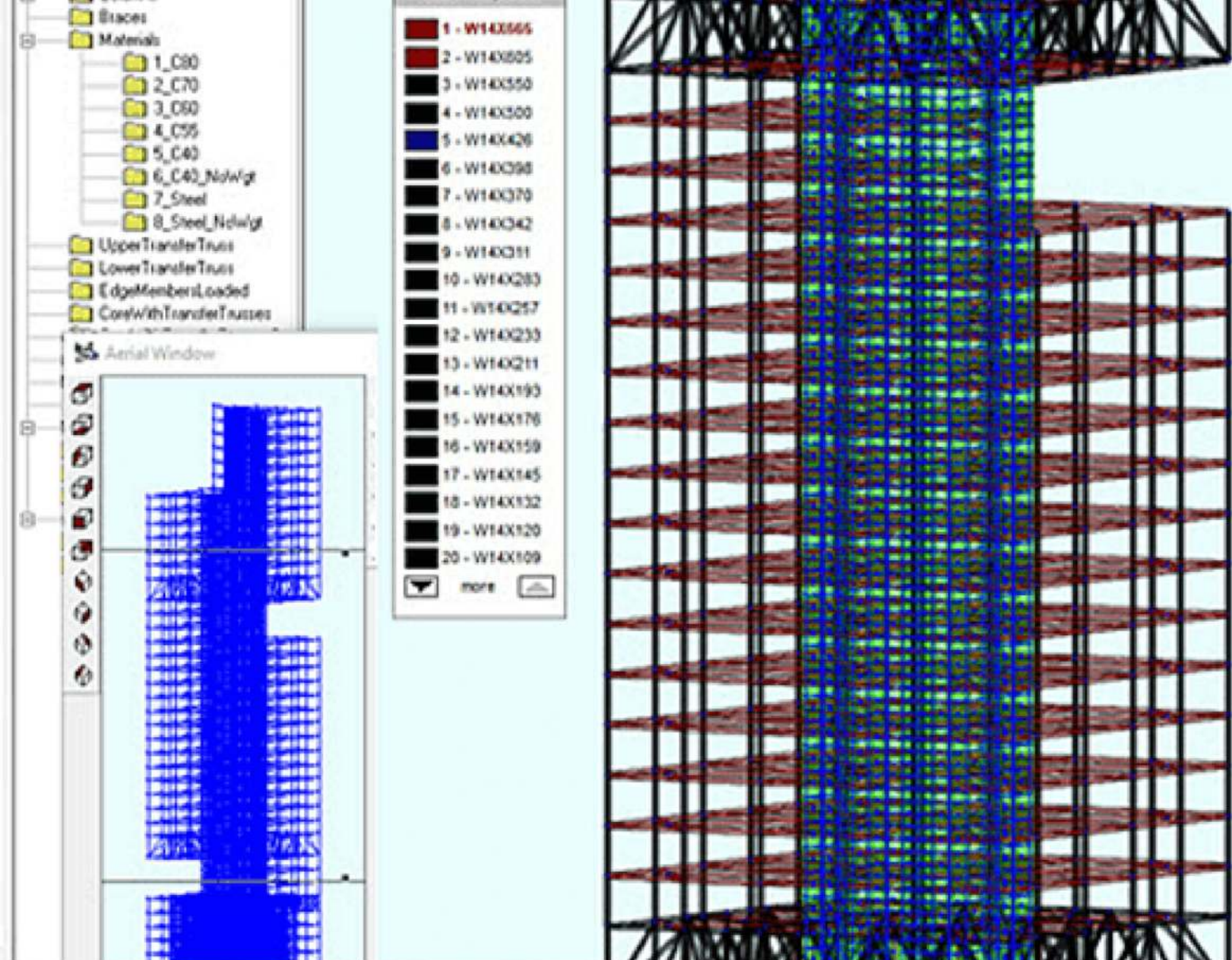
ALTAIR INSPIRE EXTRUDE METAL IS AN EASY-TO-LEARN TOOL THAT ENABLES SIMULATION TO BE USED BY ANY ENGINEER OR DESIGNER TO INCREASE THEIR UNDERSTANDING OF HOW PROFILE FEATURES AND PROCESS VARIABLES INTERACT FOR ANY PARTICULAR METAL ALLOY OR POLYMER.

IT WILL HELP YOUR TEAM ACHIEVE PRODUCTIVITY GAINS BY REDUCING PRODUCT DEVELOPMENT COSTS AND IMPROVE EXTRUSION QUALITY, INCREASING PRODUCTION YIELD AND CUSTOMER SATISFACTION.

- REDUCE MANUFACTURING COST AVOIDING COSTLY PROTOTYPES
- EFFICIENT AND PROCESS-DRIVEN, QUICK AND EASY TO LEARN
- VIRTUAL DIE TRIALS TO DESIGN OPTIMAL DIES AND PARTS

STRUCTURAL ENGINEERING AND DESIGN (AEC)

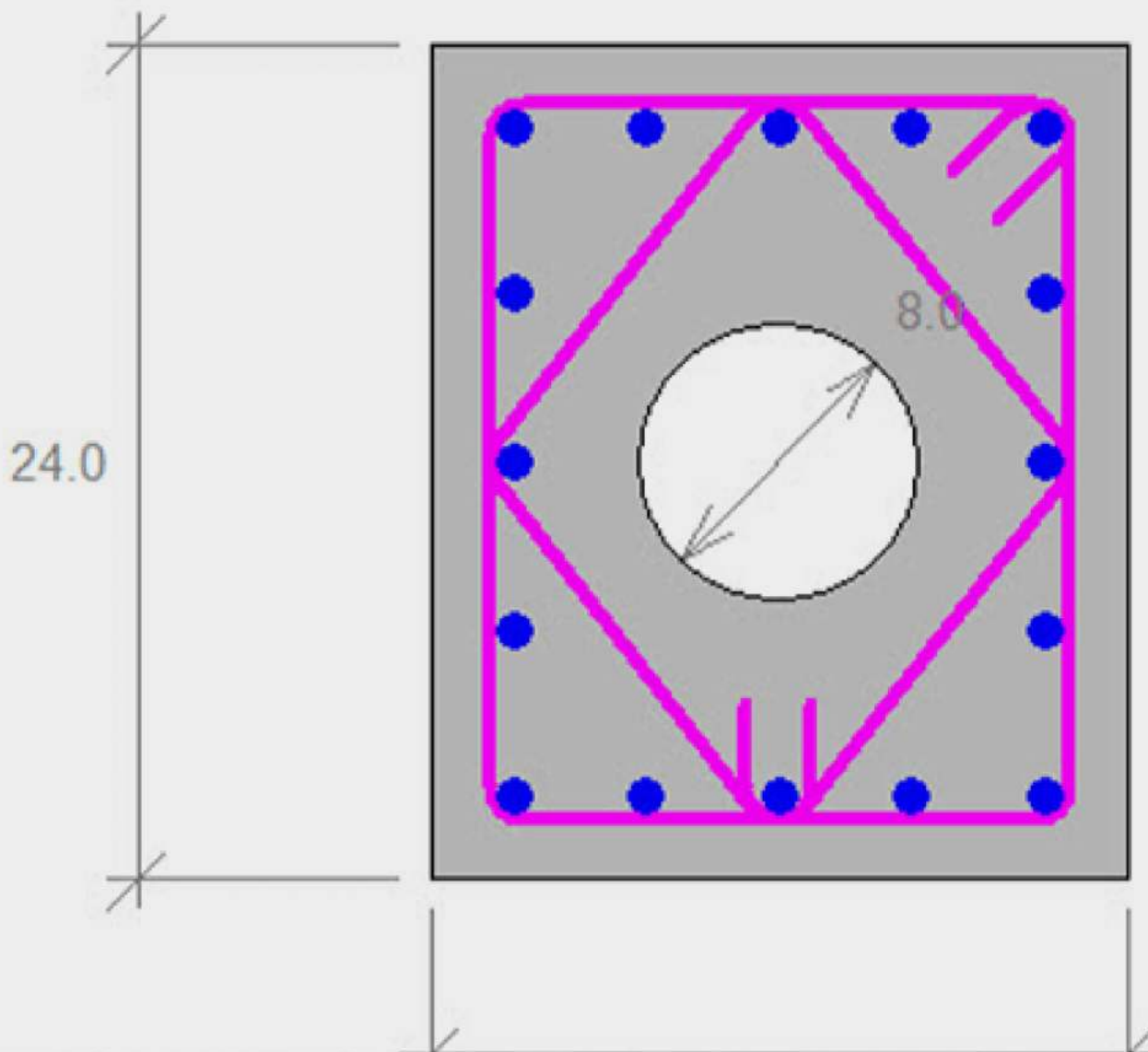
Versatility and data integration drive productivity for building and non-building structures. Altair's Architecture, Engineering, and Construction (AEC) structural analysis and design solutions simulate responses to wind, snow, water, seismic, blast, dead, live, and moving loads, or other dynamic, nonlinear loading conditions while ensuring design resiliency and regional code compliance. Extensive data transfer links manage consecutive import and export cycles between analysis and design solutions, building information modeling (BIM) systems, and/or CAD platforms. Design and optimize concrete, steel, and timber to regional codes, generating report-ready results for all structural elements in a model.



ALTAIR S-FRAME

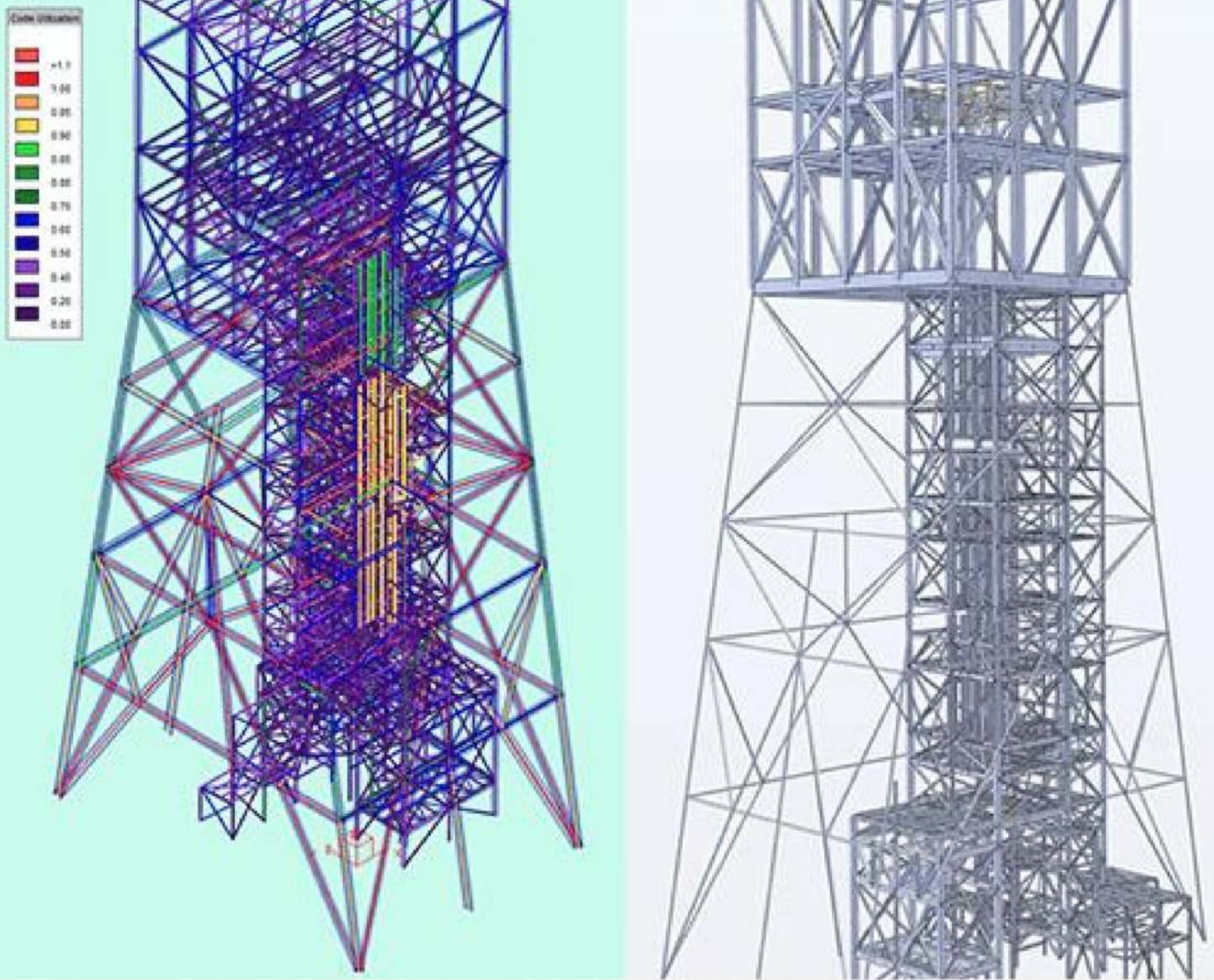
ALLOWS USERS TO SIMULATE THE RESPONSE TO INTERNAL AND EXTERNAL FORCES DURING AND AFTER CONSTRUCTION. REGARDLESS OF GEOMETRIC COMPLEXITY, MATERIAL TYPE, LOADING CONDITIONS, OR NONLINEAR EFFECTS, S-FRAME ANALYZES STRUCTURAL BEHAVIOR AND GENERATES REACTION FORCES SO ENGINEERS CAN OPTIMIZE MODELS WHILE VERIFYING COMPLIANCE WITH REGIONAL DESIGN CODES FOR STEEL, CONCRETE, AND/OR MULTI-MATERIAL STRUCTURES.

#5 TIES @ 12.0



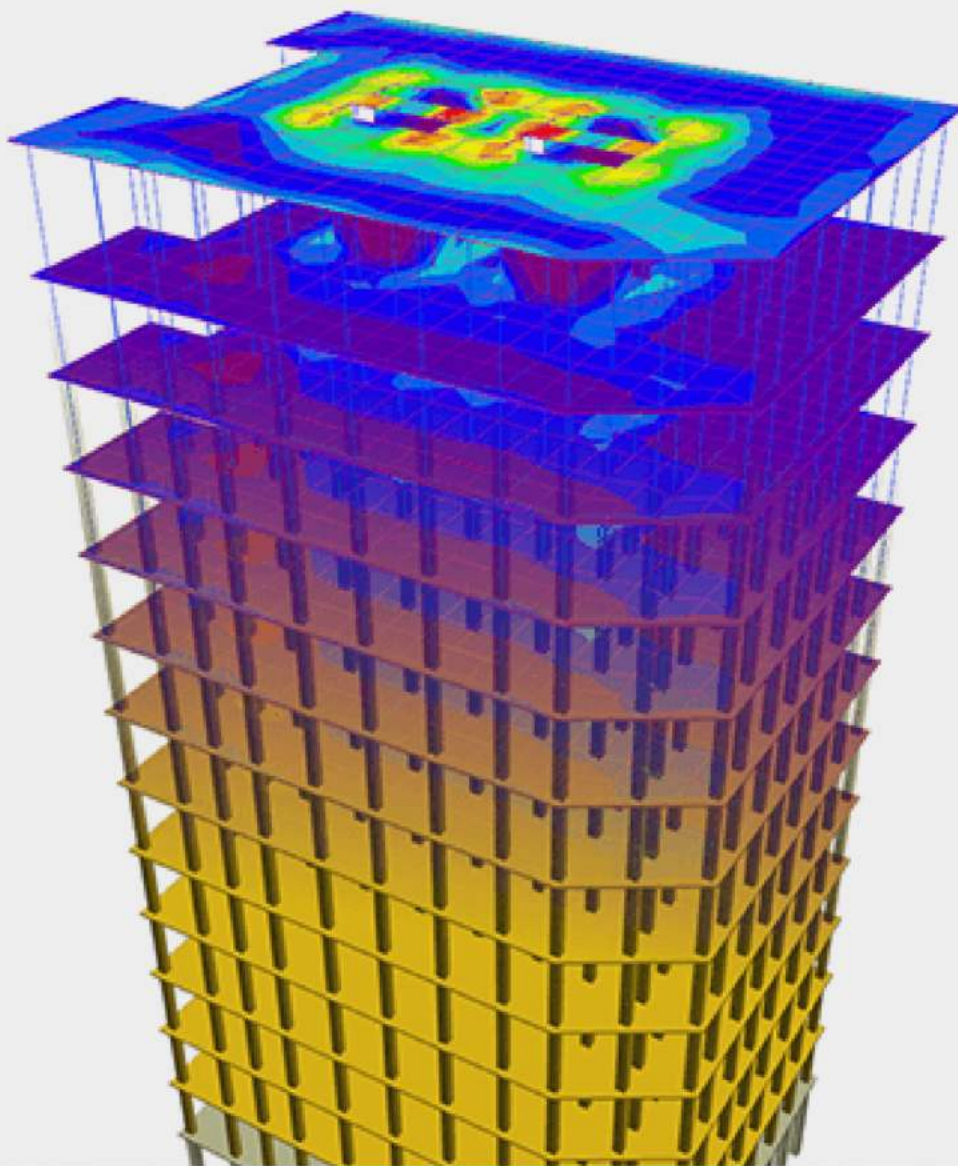
ALTAIR S-CONCRETE

QUICKLY AND ACCURATELY DESIGNS REINFORCED CONCRETE COLUMN, BEAM, WALL SECTIONS, AND CONTINUOUS BEAMS TO REGIONAL DESIGN CODE REQUIREMENTS. USERS CAN SAVE TIME BY AUTOMATICALLY CHECKING THOUSANDS OF CONCRETE DESIGNS AT ONCE, AND CAN PRODUCE TRANSPARENT AND COMPREHENSIVE DESIGN REPORTS THAT LIST CLAUSE REFERENCES AND INTERMEDIATE RESULTS, INDICATING AREAS THAT REQUIRE MORE ATTENTION. S-CONCRETE INCORPORATES CONCRETE DESIGN PRINCIPLES AND STATE-OF-THE-ART ANALYSIS TECHNIQUES, MAKING IT POWERFUL, VERSATILE, AND EASY TO USE.



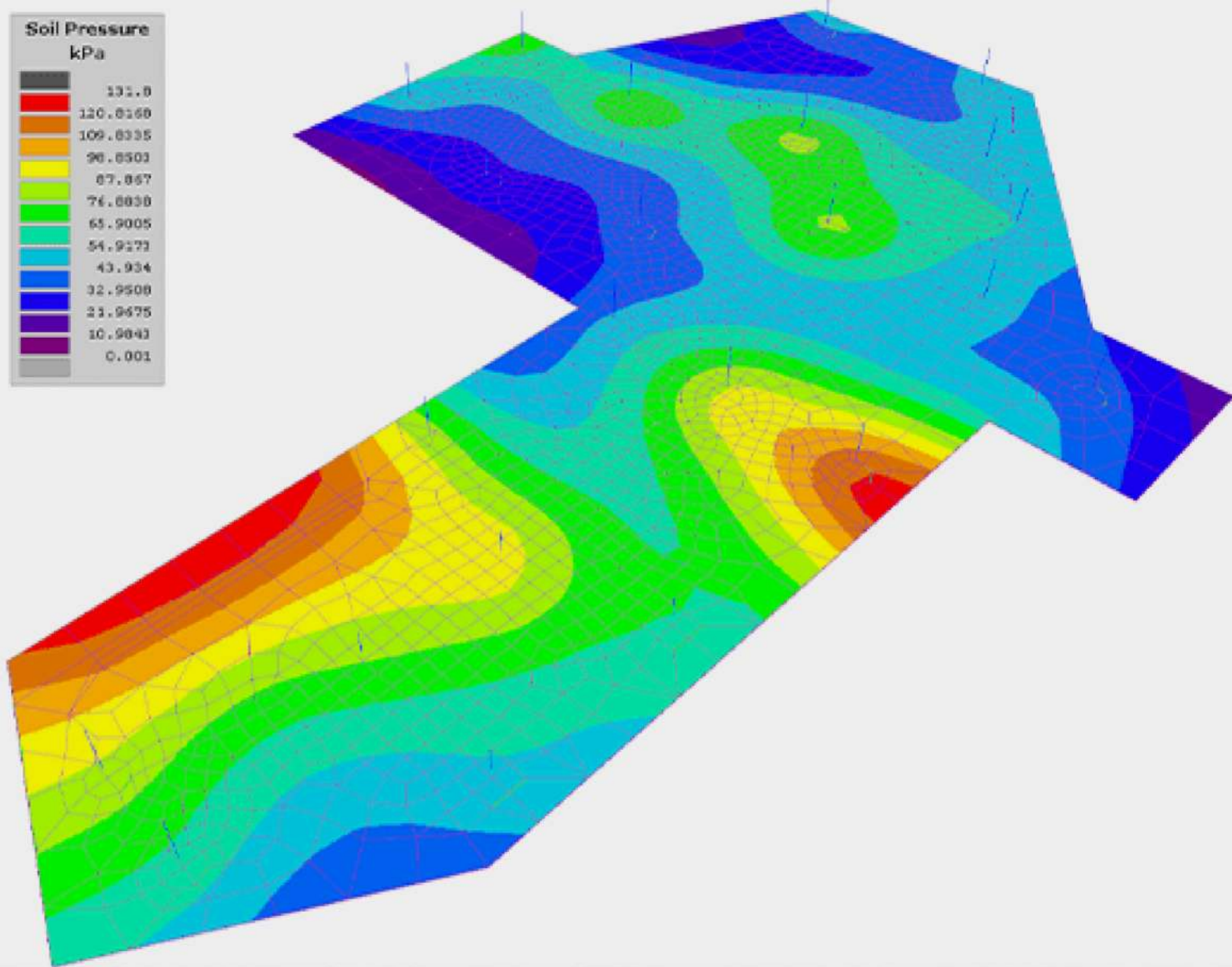
ALTAIR S-STEEL

PROVIDES TRANSPARENT, COMPREHENSIVE RESULTS FOR ANY STEEL DESIGN PROJECT. WITH IT, USERS CAN CODE-CHECK AND AUTO-DESIGN FOR STRENGTH, SERVICEABILITY, AND COMPLIANCE TO REGIONAL DESIGN CODES. S-STEEL SUPPORTS COMPOSITE BEAM DESIGN, STAGED CONSTRUCTION, AND NUMEROUS OPTIMIZATION CRITERIA AND CONSTRAINTS. USERS SAVE TIME BY EASILY GENERATING AND EXPORTING DESIGN RESULTS TO CUSTOMIZED ENGINEERING REPORTS THAT INCLUDE CLAUSE REFERENCES, EQUATIONS DEPLOYED, IDENTIFYING PASSING OR FAILING STEEL MEMBERS.



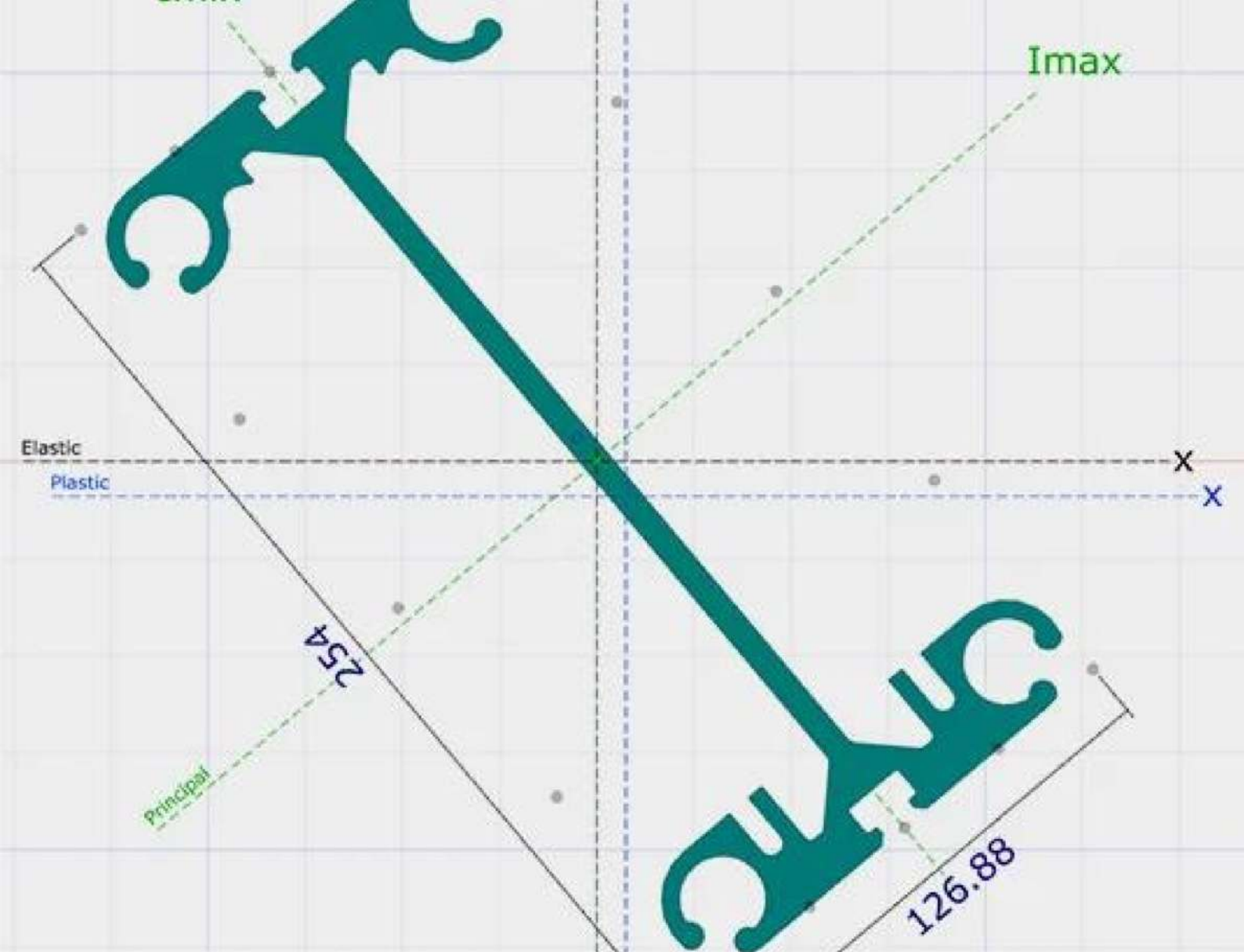
ALTAIR S-TIMBER

IS A DEDICATED DESIGN ENVIRONMENT FOR MASS TIMBER AND HYBRID TIMBER ANALYSIS. USERS CAN DESIGN SAWN LUMBER, GLULAM, AND CLT ELEMENTS TO CODE COMPLIANCE AND OPTIMIZE AFTER ANALYZING THE TIMBER/HYBRID-TIMBER STRUCTURE. WITH ADVANCED 3D ANALYSIS, AUTOMATIC MESH GENERATION, AUTOMATIC SECTION AND MATERIAL PROPERTY CALCULATIONS, PLUS EXTENSIVE CUSTOMIZATION CAPABILITIES, S-TIMBER IS IDEAL FOR IRREGULAR GEOMETRY AND COMPLEX STRUCTURES.



ALTAIR S-FOUNDATION

USERS CAN ANALYZE, DESIGN, AND DETAIL FOUNDATIONS IN A FLEXIBLE, AUTOMATED FOUNDATION MANAGEMENT SOLUTION. WITH VERSATILE MODELING CAPABILITIES, USERS CAN DESIGN IRREGULAR OR STEPPED MATS, AND DEEP OR SHALLOW FOUNDATIONS. SAVE TIME BY AUTOMATING REPETITIVE PROCESSES, CUSTOMIZE CAPABILITIES TO MEET PROJECT REQUIREMENTS, AND SMOOTHLY TRANSFER SUPERSTRUCTURE MODEL AND ANALYSIS RESULTS FROM S-FRAME AND S-TIMBER TO PERFORM THE SUBSTRUCTURE DESIGN.

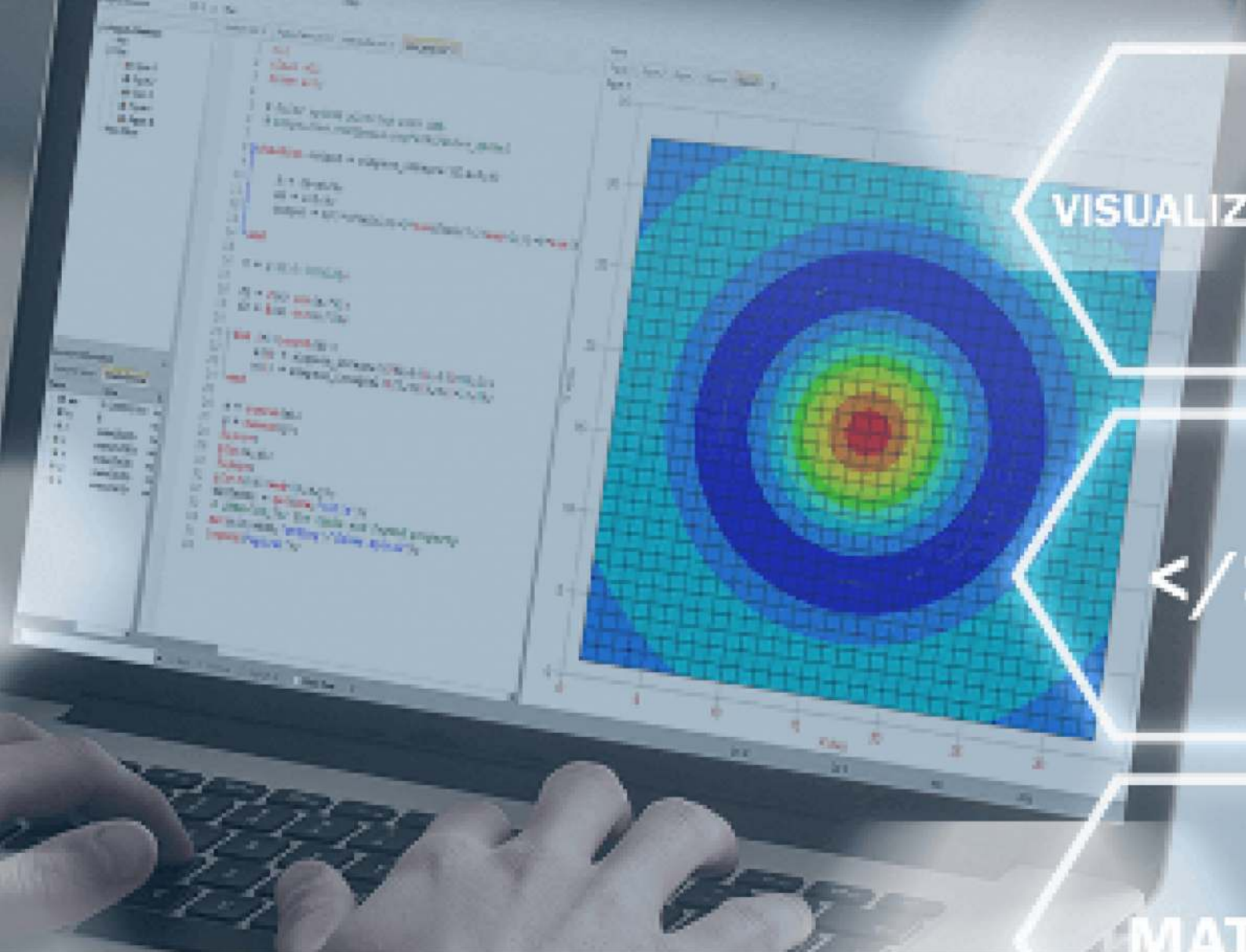


ALTAIR S-CALC

USERS CAN INCREASE THEIR PRODUCTIVITY AND DESIGN ACCURACY BY QUICKLY GENERATING OVER SIXTEEN DISTINCT SECTION PROPERTIES FOR NONSTANDARD GEOMETRY AND MULTI-MATERIAL CONFIGURATIONS. WITH ITS INTUITIVE, INTERACTIVE WORK ENVIRONMENT USERS CAN EASILY DEFINE MODELS IN THE GRAPHICAL EDITOR OR IMPORT GEOMETRY, MATERIAL, AND SECTION PROPERTY DATA FROM DXF AND BIM FILES. THEY CAN ALSO SELECT DIFFERENT CALCULATION METHODS, INCLUDING DATABASE VALUES, CLOSED-FORM SOLUTIONS, FEA METHODS, AND MORE. EXPORT PROPERTIES WITH S-FRAME, S-FOUNDATION, AND S-TIMBER INTEGRATION LINKS.

SYSTEMS MODELING

Altair model-based development (MBD) tools drive fast development for smarter connected systems. Altair customers simulate complex products as systems-of-systems throughout your entire development cycle from early concept design to detailed design to hardware-in-the-loop testing (HIL). Explore more by combining mechanical models with electrical models (in 0D, 1D, and/or 3D) to enable multi-disciplinary simulation and leverage automatic code-generation for your next generation embedded systems.

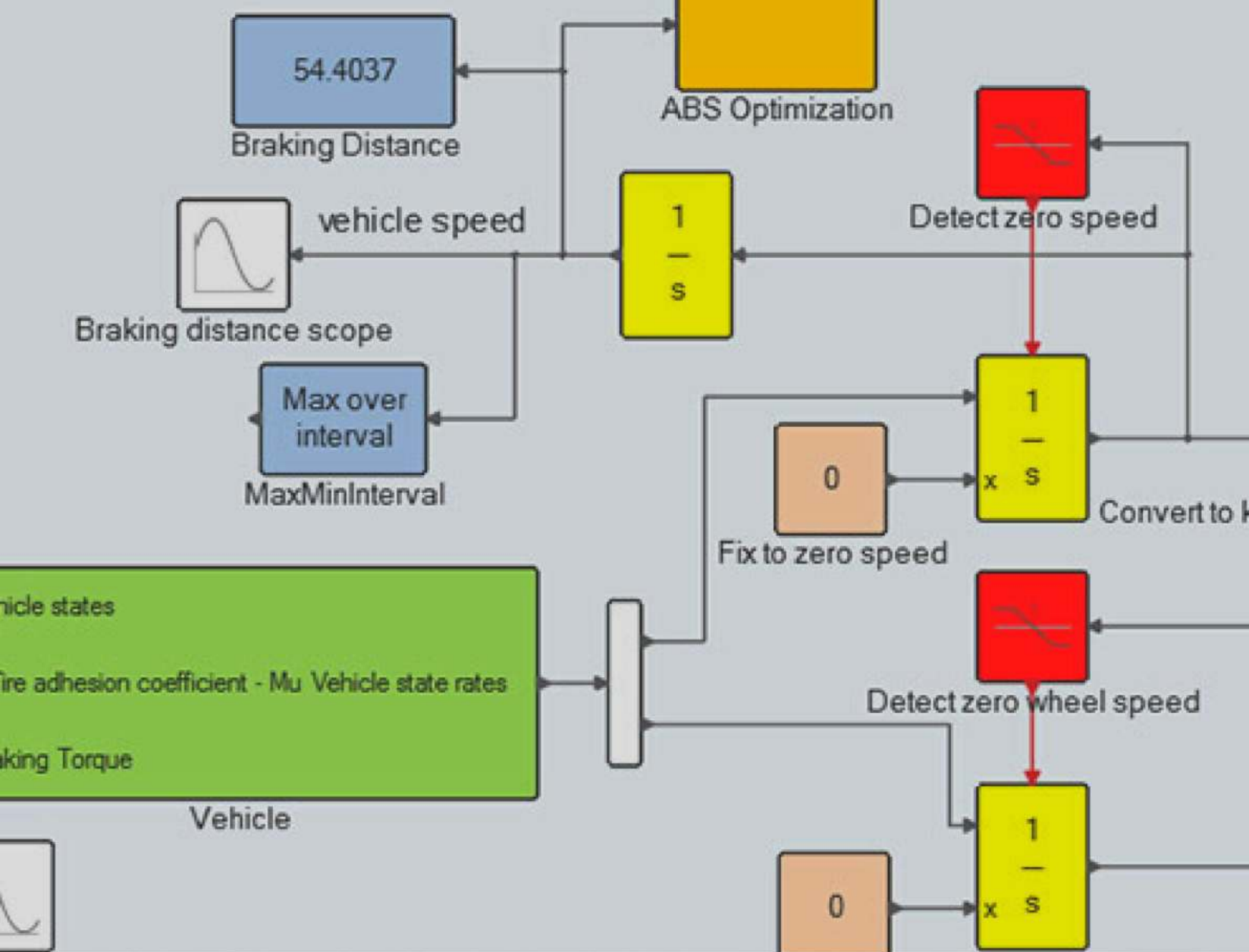


ALTAIR COMPOSE

Math, Scripting, Data Analysis & Visualization

COMPOSE IS AN ENVIRONMENT FOR DOING CALCULATIONS, MANIPULATING AND VISUALIZING DATA (INCLUDING FROM CAE SIMULATIONS OR TEST RESULTS), PROGRAMMING AND DEBUGGING SCRIPTS USEFUL FOR REPEATED COMPUTATIONS AND PROCESS AUTOMATION.

- IT ALLOWS USERS TO PERFORM A WIDE VARIETY OF MATH OP'S
- ALL-IN-ONE USER-FRIENDLY INTEGRATED DEVELOPMENT ENVIRONMENT (IDE)
- BETTER, INFORMED ENGINEERING DECISIONS



ALTAIR ACTIVATE

Multi Disciplinary System Simulation

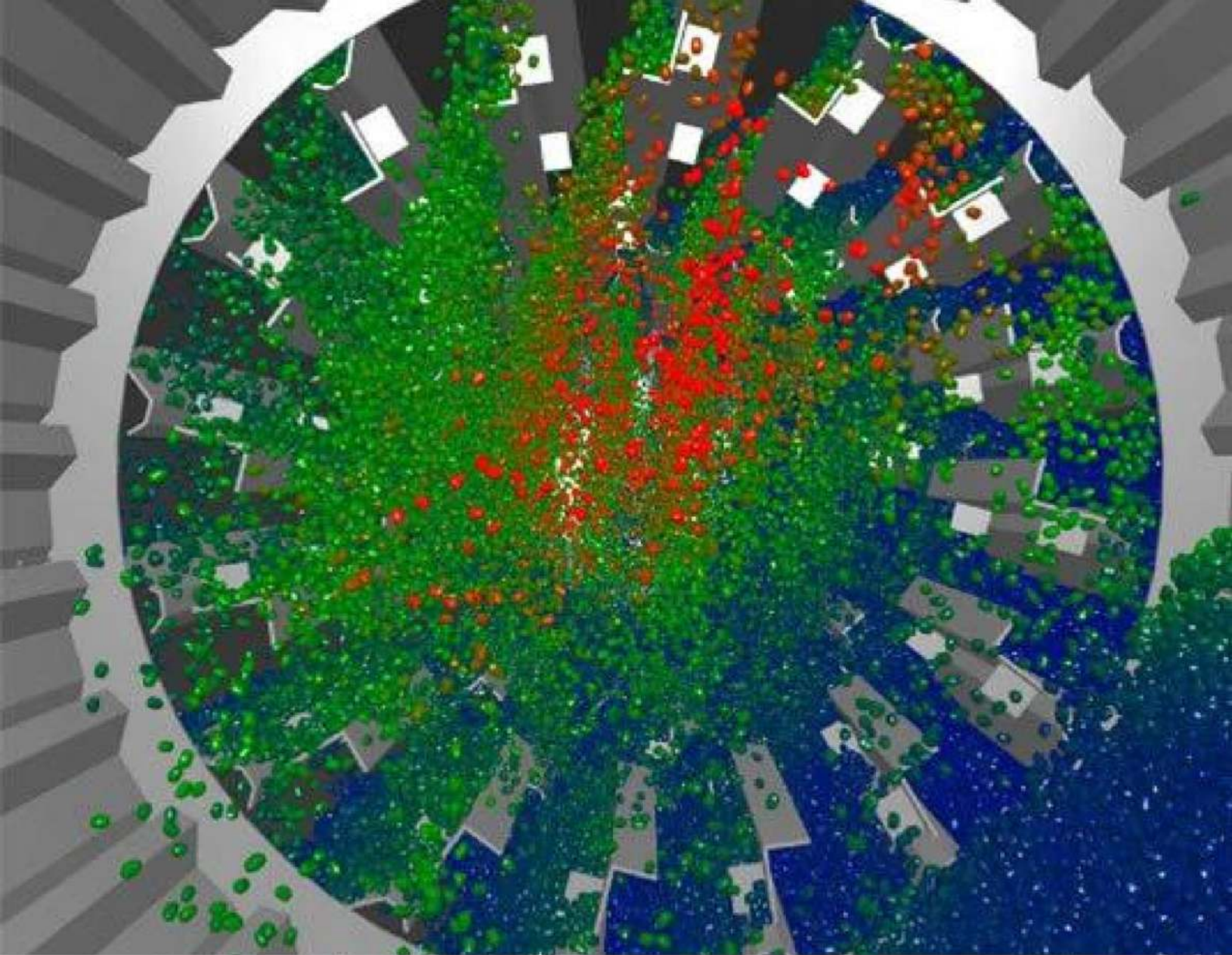
ACTIVATE IS AN OPEN & FLEXIBLE TOOL FOR RAPIDLY MODELING AND SIMULATING PRODUCTS AS MULTI-DISCIPLINARY SYSTEMS IN THE FORM OF 1D MODELS (EXPRESSED AS SIGNAL-BASED OR PHYSICAL BLOCK DIAGRAMS), OPTIONALLY COUPLED TO 3D MODELS.

- HOLISTIC ASSESSMENT OF SYSTEMS AND SYSTEM-OF-SYSTEMS
- INCORPORATE MULTI-DISCIPLINARY ASPECTS IN SYSTEM SIMULATION

SUPPORTS MODELICA AND FMU OPEN STANDARD

FLUIDS AND THERMAL

Whether you're an analyst performing advanced computational fluid dynamics (CFD) modeling or a design engineer who quickly needs to understand fluid or thermal effects on a design proposal, Altair offers a complete line of tools to support your project. From detailed component analysis to full systems performance, Altair provides a range of scalable solvers under Altair CFD™, as well as robust pre- and post-processing software for CFD.



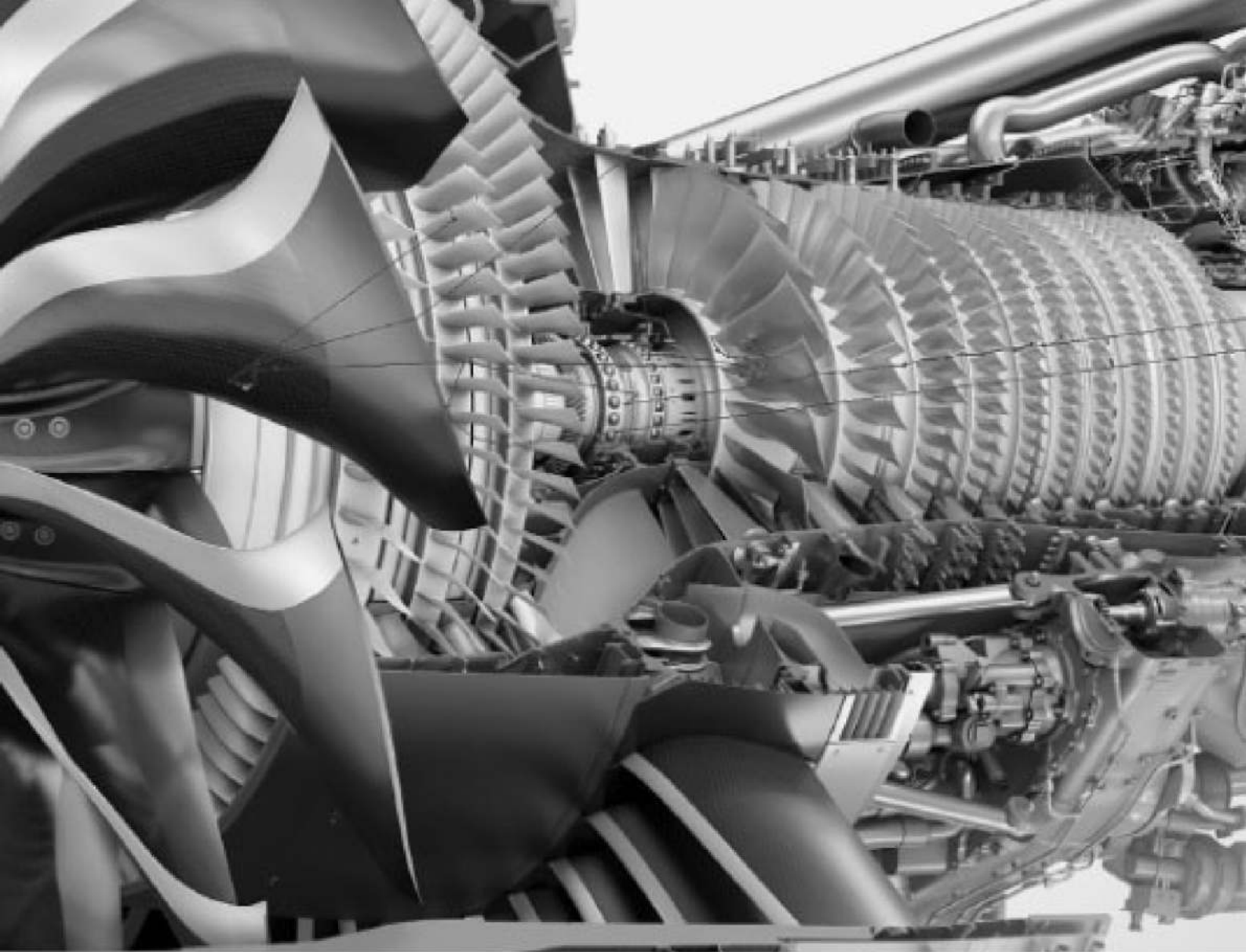
ALTAIR EDEM

Granular Material Simulation

EDEM IS A HIGH-PERFORMANCE SOFTWARE FOR GRANULAR MATERIAL SIMULATION, POWERED BY THE DISCRETE ELEMENT METHOD (DEM).

EDEM SIMULATES AND ANALYSES THE BEHAVIOUR OF BULK MATERIALS SUCH AS COAL, MINED ORES, SOIL, GRAINS AND POWDERS. IT PROVIDES ENGINEERS WITH CRUCIAL INSIGHT INTO HOW GRANULAR MATERIALS INTERACT WITH EQUIPMENT. IT IS USED FOR BOTH VIRTUAL TESTING OF EQUIPMENT DESIGN AS WELL AS PROCESS OPTIMIZATION.

- HEAVY EQUIP., MINING & METALS, PROCESS MANUFACTURING
- INTEGRATED COUPLING WITH MOTIONSOLVE AND OPTISTRUCT



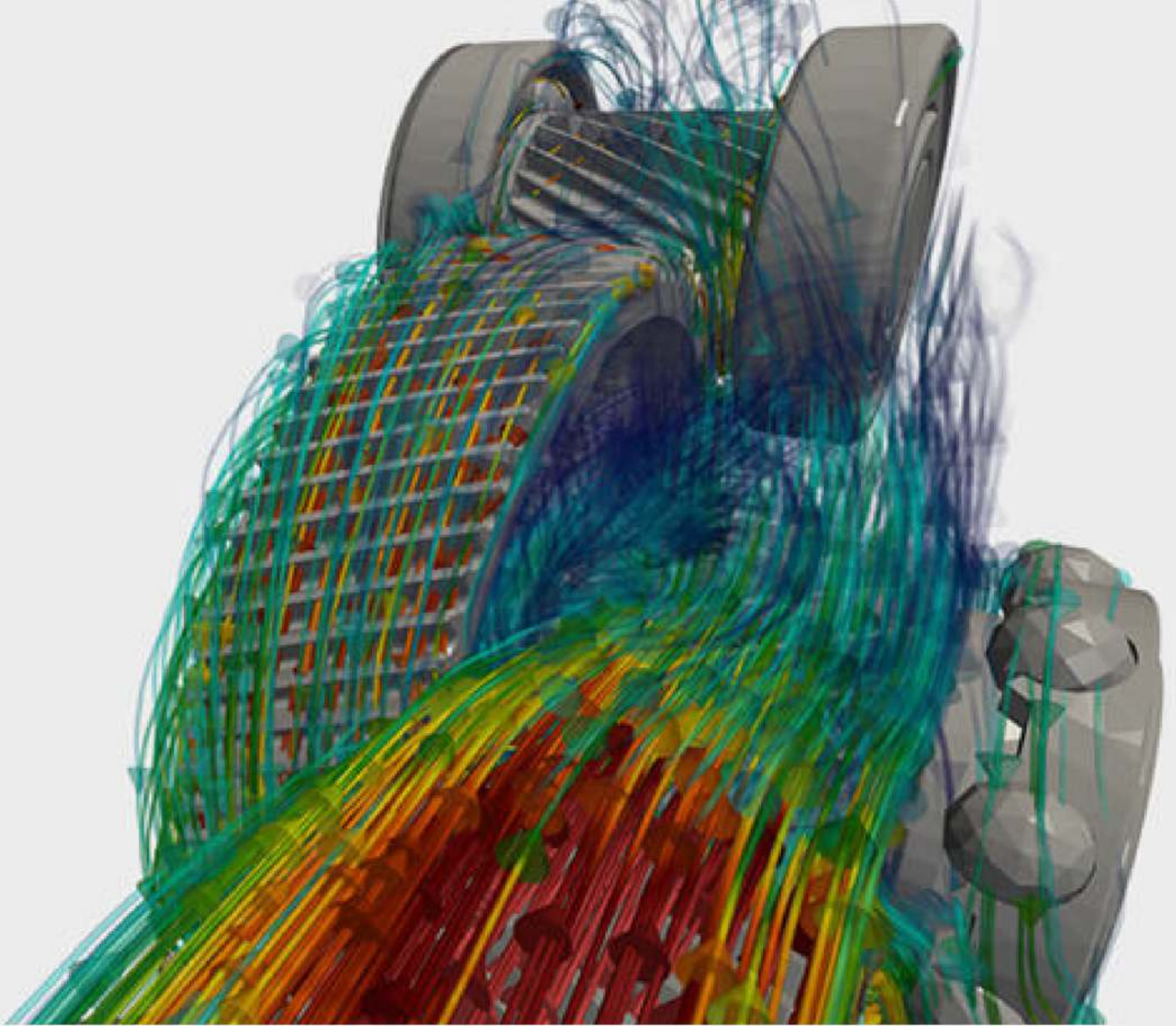
ALTAIR FLOWSIMULATOR

Integrated Thermo fluid System Design

FLOW SIMULATOR IS AN INTEGRATED FLOW, HEAT TRANSFER, AND COMBUSTION DESIGN SOFTWARE THAT ENABLES MULTIDISCIPLINARY ENGINEERING SIMULATIONS TO OPTIMIZE MACHINE DESIGN.

FLOW SIMULATOR ALLOWS YOU TO STUDY HOW SYSTEMS WILL BEHAVE IN THE REAL WORLD, WHERE FLUID IS THE DRIVING FACTOR.

- MULTIDISCIPLINARY FLUID, THERMAL, AND COMBUSTION ANALYSES CAPABILITIES
 - MIXED FIDELITY 1D-3D CFD SIMULATIONS
 - ADVANCED ROTATING CAVITY SYSTEM MODULE
- SIMULATION OF EXTREMELY LARGE FLUID SYSTEMS
 - TRANSIENT MISSIONS
 - RESULT ANALYSIS FEATURE



ALTAIR CFD

Unparalleled Breadth of CFD Simulation Solutions

ALTAIR CFD OFFERS A COMPREHENSIVE SET OF TOOLS TO SOLVE FLUID MECHANICS PROBLEMS. WHETHER YOU ARE LOOKING TO PERFORM THERMAL ANALYSIS OF BUILDINGS, PREDICT AERODYNAMICS OF VEHICLES, OPTIMIZE GEARBOX OILING, REDUCE COOLING FAN NOISE, OR DEVELOP INNOVATIVE MEDICAL DEVICES, ALTAIR CFD CAN HELP.

- A GENERAL-PURPOSE NAVIER-STOKES (NS) SOLVER FOR THERMAL AND GENERAL-PURPOSE APPLICATIONS
- A SMOOTHED-PARTICLE HYDRODYNAMICS (SPH) SOLVER BEST SUITED FOR SIMULATING FREE SURFACE OILING, SLOSHING AND MIXING
- A LATTICE BOLTZMANN METHOD (LBM) SOLVER FOR AERODYNAMICS AND AERO-ACOUSTICS

HIGH- PERFORMANCE COMPUTING AND CLOUD

In the data center and in the cloud, Altair's industry-leading HPC tools let you orchestrate, visualize, optimize, and analyze your most demanding workloads, easily migrating to the cloud and eliminating I/O bottlenecks. Top500 systems and small to mid-sized computing environments alike rely on Altair to keep infrastructure running smoothly. With longstanding hardware and cloud provider partnerships, we handle the integrations for you so your team can focus on moving business forward.



ALTAIR GRID ENGINE

Distributed Resource Management and Optimization

ALTAIR GRID ENGINE IS A LEADING DISTRIBUTED RESOURCE MANAGEMENT SYSTEM FOR OPTIMIZING WORKLOADS AND RESOURCES IN THOUSANDS OF DATA CENTERS, IMPROVING PERFORMANCE AND BOOSTING PRODUCTIVITY AND EFFICIENCY.

ALTAIR GRID ENGINE HELPS ORGANIZATIONS IMPROVE ROI AND DELIVER BETTER RESULTS FASTER BY OPTIMIZING THROUGHPUT AND PERFORMANCE OF APPLICATIONS, CONTAINERS, AND SERVICES WHILE MAXIMIZING SHARED COMPUTE RESOURCES ACROSS ON-PREMISES, HYBRID, AND CLOUD INFRASTRUCTURES.



ALTAIR HERO

End-to-end Hardware Emulation Enterprise Job Scheduler

HERO IS AN END-TO-END SOLUTION DESIGNED SPECIFICALLY FOR HARDWARE EMULATION ENVIRONMENTS. HERO ADDRESSES ALL ASPECTS OF EMULATION FLOW INCLUDING DESIGN COMPILATION, EMULATOR SELECTION, AND SOFTWARE AND REGRESSION TESTS.

HERO'S VENDOR-INDEPENDENT ARCHITECTURE AND COMPREHENSIVE POLICY MANAGEMENT FEATURES GIVE YOU FLEXIBILITY AND CONTROL — PLUS GREATER VISIBILITY INTO EMULATOR STATUS, CUSTOMIZABLE ALERTS AND NOTIFICATIONS, AND OPTIMIZED HARDWARE UTILIZATION.



ALTAIR NAVOPS

Cloud Migration, Automation, and Spend Management for HPC

NAVOPS HELPS ENTERPRISES MIGRATE COMPUTE-INTENSIVE HPC WORKLOADS TO THE CLOUD. IT IS APPLICATION, RESOURCE, AND BUDGET-AWARE, PROVIDING REAL-TIME INSIGHTS INTO WORKLOADS AND SPENDING WITH COMPLETE VISIBILITY INTO HPC CLOUD RESOURCES.

BY COMBINING SOPHISTICATED AUTOMATION WITH CLOUD SPEND MANAGEMENT, ORGANIZATIONS CAN BOOST EFFICIENCY, REDUCE CLOUD COSTS, AND IMPROVE TIME-TO-RESULTS, ULTIMATELY IMPROVING REVENUE AND PROFITABILITY.

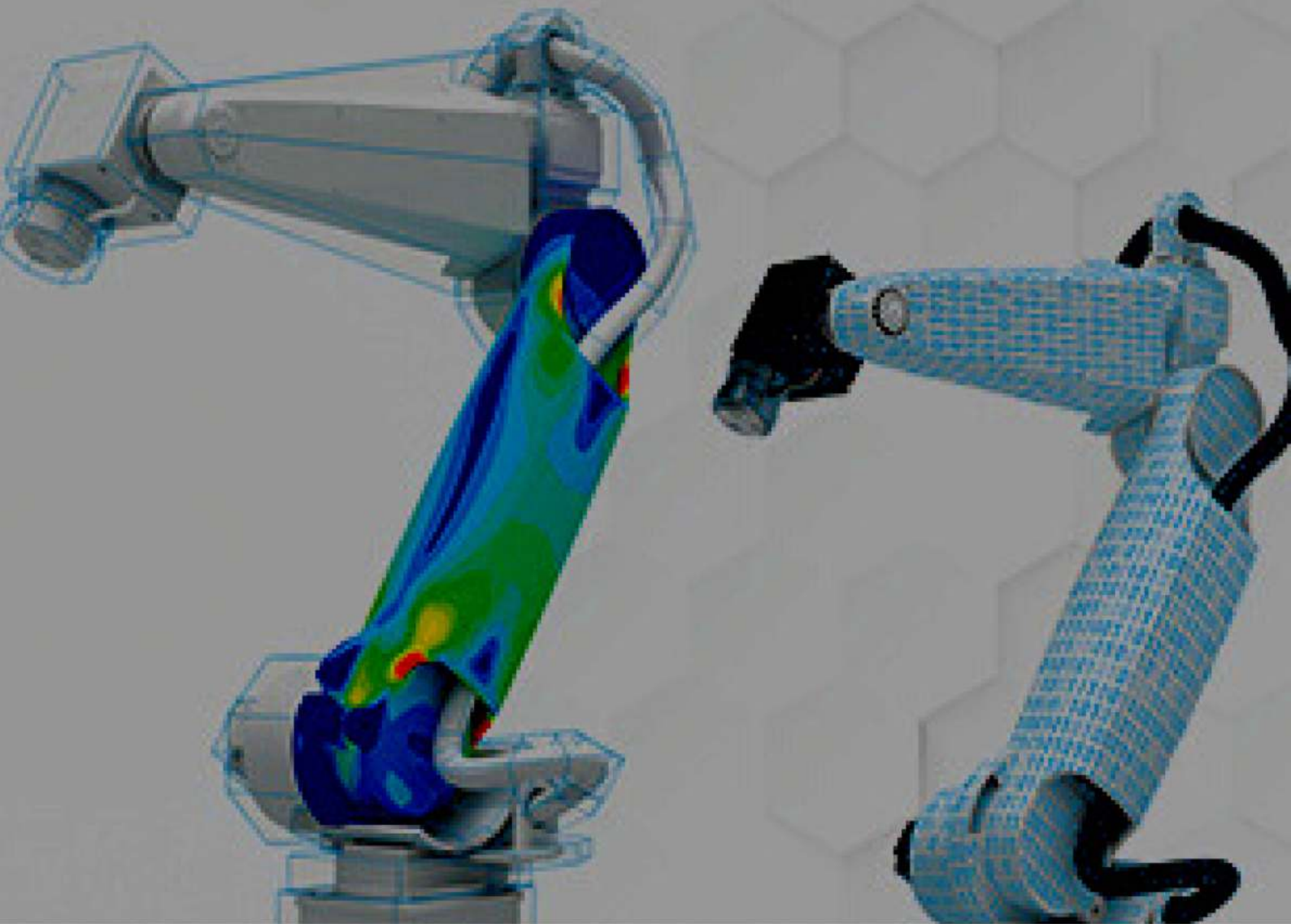


ALTAIR FLOWTRACER

Mission-critical Dependency Management

FLOWTRACER IS AN ADVANCED DESIGN FLOW DEVELOPMENT AND EXECUTION PLATFORM THAT PROVIDES USERS WITH UNIQUE FLOW VISUALIZATION AND TROUBLESHOOTING CAPABILITIES FOR GREATER PRODUCTIVITY. FLOWTRACER PROVIDES FLOW VISUALIZATION, ANALYZES FLOWS, AND IDENTIFIES INHERENT PARALLELISM BUILT INTO TODAY'S COMPLEX FLOWS, OPTIMIZING USE OF COMPUTE RESOURCES.

FLOWTRACER IS DESIGNED TO SUPPORT FLOWS ACROSS A WIDE VARIETY OF APPLICATIONS SUCH AS SEMICONDUCTOR DESIGN, ALGORITHM EVALUATION, SOFTWARE DEVELOPMENT, AND MORE.



ALTAIR CONTROL

Resource and Dependency Management

CONTROL IS AN EASY-TO-USE WEB APPLICATION FOR MONITORING AND MANAGING CLUSTER CONFIGURATION AND REPORTING IN A HIGH-PERFORMANCE COMPUTING (HPC) ENVIRONMENT.

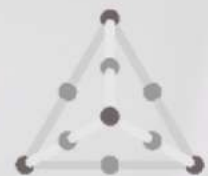
ALTAIR CONTROL HAS SEAMLESS CLOUD BURSTING CAPABILITIES, ALONG WITH ADVANCED ANALYTICS TO SUPPORT DATA-DRIVEN PLANNING AND DECISION-MAKING. ADMINISTRATORS CAN PERFORM WHAT-IF ANALYSIS USING WORKLOAD SIMULATION TO DETERMINE THE MOST PRODUCTIVE WAY TO SCALE HPC SYSTEM'S RESOURCES AND CLOUD APPLIANCES.

- SEAMLESS CLOUD BURSTING
- A DIGITAL TWIN FOR YOUR DATACENTER
- EASY HPC JOB MANAGEMENT AND MONITORING

Accelerating Innovation

INTEGRAL MINING

ADVANCED NUMERICAL MODELING



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