SIMULIA FOR EDUCATION
PRODUCT AND PORTFOLIO OVERVIEW

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PRODUCT OVERVIEW

The SIMULIA for Education portfolio consists of software tools that covers the following spectrum of simulation topics: nonlinear finite element analysis (FEA), electromagnetic analysis (EM), durability analysis and optimization.

Abaqus—Finite Element Analysis (FEA)

Abaqus is a long-standing, industry proven software for linear and nonlinear finite element analysis, both implicit and explicit. Renowned for its accuracy and robustness, Abaqus permits to solve a broad range of simulation tasks:

- Static stress/displacement analysis:
- Transient dynamic stress/displacement analysis
- Transient or steady-state heat transfer analysis
- Transient or steady-state mass diffusion analysis
- Steady-state transport analysis
- Thermal-mechanical analysis
- Structural-acoustic analysis
- Linear piezoelectric analysis

- Thermal-electrical (Joule heating) analysis
- Thermal-electrical-structural analysis
- Fully or partially saturated pore fluid flow-deformation
- High-speed dynamics

User-defined subroutines allow flexibility in modeling advanced research materials, complex elements, surface and contact behaviors, and other user-specific features.

Parallel processing capabilities allows efficiently running large jobs consisting of up to several millions degree of freedoms.

Abaqus/CAE, the Complete Abaqus Environment, the Abaqus specific pre- and postprocessor provides for parametric, feature-based modeling, analysis monitoring, and results evaluation.

Associative Interfaces for both CATIA V5 and SOLIDWORKS to exchange native CAD data.

PRODUCT OVERVIEW

CST Studio Suite—Electromagnetic Analysis (EM)

CST Studio Suite is a high-performance 3D EM analysis software package for designing, analyzing and optimizing electromagnetic components and systems. It covers a broad frequency range from a few Hertz up to Terahertz.

- Complete Technology for 3D EM simulation in one interface
- General purpose solvers and many special purpose solvers to choose from involving high-frequency and low Frequency solvers, Multiphysics solvers, and Specialized Particle solvers
- Synthesis and Analysis Tools, Computer Aided Design (CAD) and electronic design automation (EDA) workflows, System-level simulation, Robust—accurate meshing and High-performance Computing

- State-of-the-art technology enables users to address EM simulation problems involving:
  - Magnets and sensors
  - Antennas
  - Microwave components
  - Signal and power integrity
  - Electromagnetic compatibility analysis
  - Electro guns and traveling wave tubes

Antenna Magus

- Antenna Magus is an antenna design and knowledge management tool integrated into CST Studio Suite. Antenna Magus has proven to be an invaluable aid to antenna design engineers and to anyone who requires antenna models for antenna placement and/or electromagnetic interference studies. An engineer can make a more informed choice of antenna element, providing a good starting design and thus increasing efficiency. Validated antenna models can be exported to CST Studio Suite for full 3D analysis

PRODUCT OVERVIEW

fe-safe—Durability Analysis

fe-safe is a leading fatigue analysis software for finite element models. It offers accurate and advanced fatigue analysis technology for real-world industrial applications. fe-safe is industry-proven in many industries such as automotive, heavy truck, off-highway, marine, defense, offshore, power generation, wind energy, medical engineering and many other industries.

Regardless of the complexity of the fatigue analysis, fe-safe fits smoothly into the design process, enabling users to develop products that are designed for durability.

- Automatic detection of fatigue hot-spots
- Strain-based multi-axial fatigue algorithms
- S-N curve analysis
- Plots of material data including temperature effects
- Analysis of welded joints
- High temperature fatigue
- Automatic detection of surfaces

Isight—Process Automation and Parametric Optimization

Isight is an open-desktop solution used to combine multiple cross-disciplinary models and applications together in a simulation process flow, automate their execution, explore the resulting design space, and identify the optimal design parameters subject to required constraints.

- Drag-and-drop process flow creation, parameter mapping, and problem formulation.
- Branching, looping, conditional, and other execution logic.
- Besides process integration of Dassault Systèmes software such as Abaqus, Dymola, CATIA V5 or SOLIDWORKS Isight provides add-on components to connect major third-party simulation applications or spreadsheet programs. A generic component connects all software with ASCII based input/output
- Design Optimization: Design of Experiments, Optimization & Target Solver, Data Matching, Approximations, Monte Carlo, Six Sigma, Taguchi.
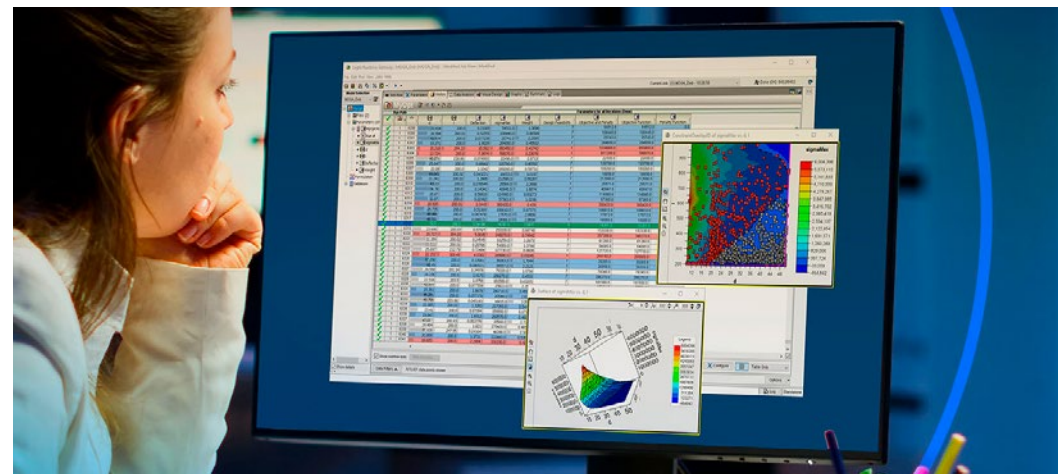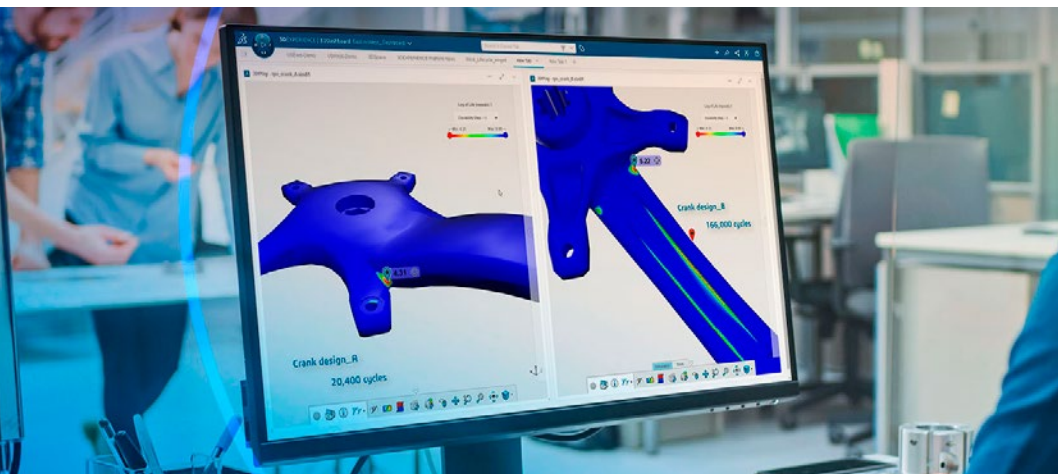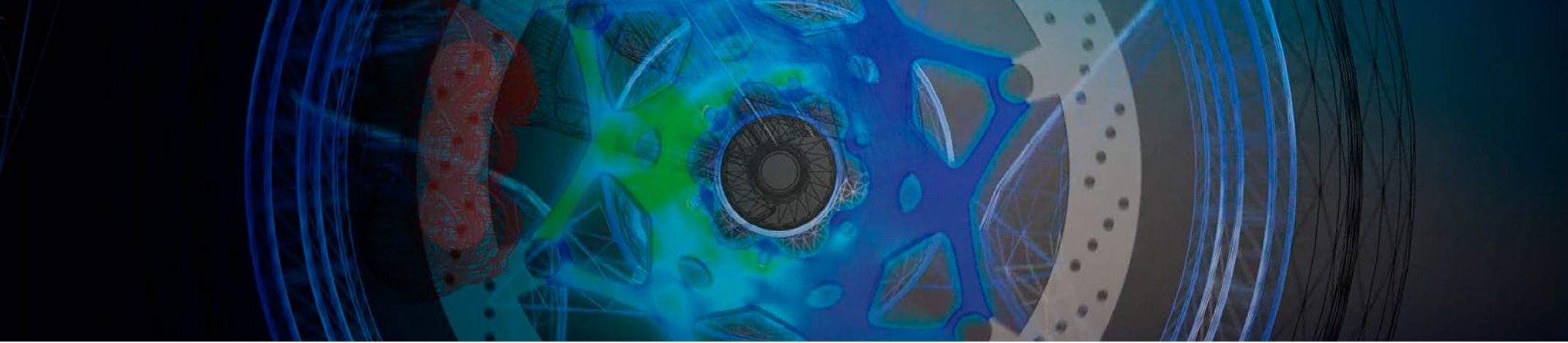
PRODUCT OVERVIEW

Tosca—Topology Optimization

Tosca consists of two parts:

- **Tosca Structure** is a mature and industry proven software system for non-parametric structural optimization using Abaqus and other industry standard finite element solvers. The Optimization Module within Abaqus/CAE provides an intuitive, integrated graphical user interface for easy setup and execution of optimization tasks with the Abaqus solver. Existing solver input files are used for the optimization. Tosca Structure is based on market-leading technology and provides advanced capabilities for optimization with nonlinear analysis and fatigue as well as a specific non-parametric morphing approach.

  - Topology Optimization
  - Sizing Optimization
  - Shape Optimization
  - Bead Optimization
  - Support for nonlinear analysis
  - Advanced shape optimization based on durability analysis
  - Shape Morphing based on node sets

- **Tosca Fluid** is a unique, modular software system for non-parametric fluid flow optimization that enables topology optimization with industry-standard CFD solvers. The setup is simple. No model parameterization is necessary, and existing simulation files (even large scale CFD models) can be used for optimization. Tosca Fluid offers state-of-the-art optimization technology that helps engineers to develop innovative product designs based solely on a given design space and a defined flow task. No initial design is necessary, and only one solver run is needed.

PORTFOLIO OVERVIEW

From undergraduate coursework to Ph.D. thesis, the SIMULIA Academic Portfolio is designed to serve all individuals of academic institutions: students, teachers, researchers, and professors.

Education licenses are available in two categories:

- **Education Licenses** are feature-rich licenses for classrooms and computer labs with minor limitations (model size) compared to the Research Licenses. They may not be used for academic non-profit research purposes.
- **Academic Non-Profit Research Licenses** provide commercial-level functionality for highly sophisticated research and are priced to suit academic budgets.

Abaqus, fe-safe, Isight, Tosca

Abaqus, fe-safe, Isight and Tosca are accessible with a single license pool.

SIMULIA Abaqus Extended for Education

Designed to equip classrooms. It consists of a 20 seats base pack that can be enhanced with 10 seats supplemental packs. The packs contain some functional limitations:

- For Abaqus: 250K nodes for Abaqus/Standard and Abaqus/Explicit simulations, no user-subroutines, limited to 4 core parallel processing
- For fe-safe, Isight and Tosca: no limitations compared to the commercial product

Access to associative interfaces for CATIA V5 and SOLIDWORKS is included.

SIMULIA Abaqus Extended for Academic Non-Profit Research

Contains commercial-level functionality. The base license for one single user already contains full functionality. It can be expanded with high granularity to address different sizes of user groups (up to entire campus) and to permit parallelization of analysis jobs.

Access to associative interfaces for CATIA V5 and SOLIDWORKS is included. Additional interface modules are available as add-ons.

CST Studio Suite

SIMULIA CST Studio Suite for Education

Consists of a 20 seats base pack that can be enhanced with 10 seats supplemental packs. The packs are limited in terms of model size. The number of available antennas is limited.

SIMULIA CST Studio Suite for Academic Non-Profit Research

Contains commercial-level functionality. A base pack with one seat includes solver capabilities as well as one interactive license. It can be enhanced with supplemental packs to address larger research groups. Acceleration token can be added to run jobs on multiple cores to speed up analysis time.

SOFTWARE LICENSING

All SIMULIA for Education software use floating network licenses ("shareable"). A computer in the customer network, known as a license server, is used to monitor the number and type of licenses used. The actual application software does not necessarily have to be installed on the license server. During the software application, the computer on which the users run the software requires a permanent network connection to the license server.

Various software licensing programs are used:

- Abaqus, fe-safe, Isight, Tosca: DSLS (flexLM as an alternative)
- CST Studio Suite: FlexLM

DSLS is the Dassault Systèmes own licensing program.

For software licensed under DSLS, it is possible to host the license server on Dassault Systèmes hardware. This eliminates the need to operate a customer's own license server.

The applications are licensed with Interactive Seats and Execute Tokens.

- Interactive Seats are used for all product graphical user interfaces (GUIs). Exactly one Interactive Seat is checked out each time a product GUI is executed.
- Execute Tokens are used for computational analysis and workflow execution. The number of Execute Tokens checked out depends upon the software and workflows being executed, as well as the number of processors being used (parallel processing) to reduce runtimes.

Determining the required number of interactive seats is comparably simple: the number of concurrent users determines the required number of licenses. But determination of the required number of tokens is rather complex as each application follows a different scheme.

Therefore token and license configurations should be calculated with the guidance of a sales representative.

Term Options
SIMULIA Education software licenses are available as:

- 3-Month lease ("QLC")
- 1-Year lease ("YLC")
- 2-Year lease ("TBL2")
- 3-Year lease ("TBL3")
- Purchase ("PLC") + Annual Maintenance ("ALC")

The license fees for lease and maintenance include free access to new releases.

LEARNING EDITIONS

For some of the software so called Learning Editions are available for download. Learning Editions are for personal use only and heavily restricted with respect to model size. Any commercial activities are prohibited.

The following Learning Editions are available:

- Abaqus Learning Edition
- CST Studio Suite Learning Edition
- Antenna Magus Learning Edition

SIMULIA EDUCATION SUPPORT POLICY

SIMULIA for Education software are made available to qualified educational institutions at a significant discount compared to commercial licenses. Support for education customers is limited to installation and licensing related topics only, and is available through the support portal. Access to the support portal requires login/password and is typically limited to two individuals per customer.
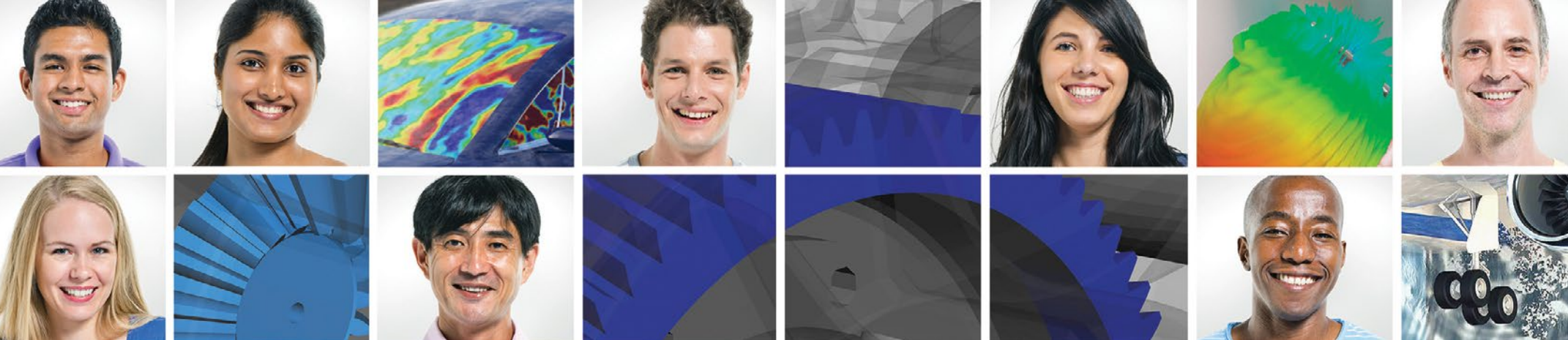
LEARNING RESOURCES

The [Support](#) section of the Dassault Systèmes [website](#) is an access point to many sources of information. These are not specific to education and SIMULIA and usually require registration.

DOCUMENTATION

Access to online documentation for user assistance for various brands and software. SIMULIA specific available for:

[Abaqus, fe-safe, Isight, Tosca](#)

DOWNLOAD

Access to the [download portal](#) to download current or older software releases (not SIMULIA specific). Requires a software license with a valid maintenance contract.

HARDWARE AND SOFTWARE

Various IT-related information on hardware and software requirements, compatibilities, etc.

[SIMULIA specific](#)

KNOWLEDGE BASE

Browse [Knowledge Base](#) (not SIMULIA specific) for specific topics.

COMMUNITIES

Variety of brand-specific user communities to find technical content, discuss with peers, share experience and give feedback.

SIMULIA specific: [SIMULIA Learning Community](#)

Edu Space

Portal with online training materials. Ask your sales representative for vouchers to gain access to the desired product-specific courses.

Program Directories

Of particular interest to IT people. Product and release specific information on IT prerequisites, installation, licensing and product updates.

(no information on CST Studio Suite)

YouTube SIMULIA channel

Extensive list of videos to learn about the software and its everyday use in industry and research.

ELIGIBILITY FOR EDUCATIONAL LICENSING

Education Licenses are governed by the Dassault Systèmes Customer License and Online Services Agreement (CLOSA) which is provided with an official quotation or upon request.

The SIMULIA education products can be used only by Educational Institutions and only for Educational or Academic Non-Profit Research purposes.

Education Institutions means a customer which is either:

(i) an accredited institution of education and/or research which is authorized to grant academic degrees (diploma or certificate) at any primary, secondary, or higher education level, and/or

(ii) an accredited institution of education delivering continuing education programs (e.g. training organization, training center, career school, vocational school).

Education and Academic Non-Profit Research Use means use of software by authorized users at Education Institutions solely for purposes that are strictly related to:

(i) education, instruction, training, upskilling of duly enrolled participant in customer's education program, and/or

(ii) research which is experimental and/or theoretical in nature, undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, up to proof of concept in a laboratory, and/or

(iii) experience-based and/or project-based learning activities which are under the direction and supervision of an Education Institution's faculty, undertaken to perform a project sponsored by one or more third parties to address problems presented by such third parties.

Undergraduate and graduate students writing work on-site with a commercial client are not eligible to use educational licenses for this purpose.

Content produced using education software may automatically contain a watermark identifying the educational use. Customer shall not remove any such watermark.

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Our **3D**EXPERIENCE® platform powers our brand applications, serving 12 industries, and provides a rich portfolio of industry solution experiences.

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