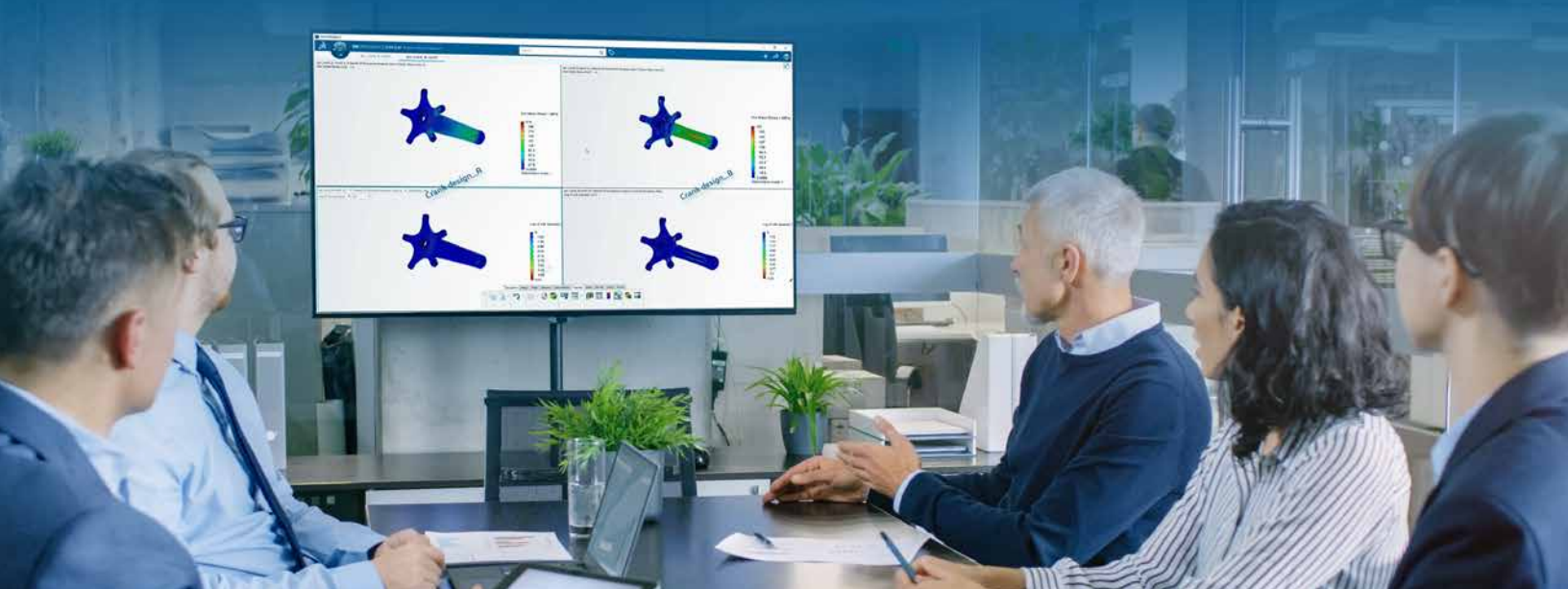


# 3DEXPERIENCE® WORKS SIMULATION PORTFOLIO

Reveal the world we live in



**Reveal the world we live in through a market-leading realistic simulation solution for Structures, Computational Fluids Dynamics, Electromagnetics, Plastics Injection and Motion simulation, including Design Exploration for the Designers and Design Engineers community.**

The 3DEXPERIENCE® WORKS Simulation portfolio from Dassault Systèmes SIMULIA brand enables Designers and Design Engineers to perform efficient product performance assessment during the design phase for multiple domains. The intuitive and robust solution empowers them in evaluating and comparing design alternatives for best in class performance, reliability and safety.

With direct associativity to the SOLIDWORKS models and guided simulation experience, evaluating real-world environment impact on the design is made easy and intuitive for quicker adoption of simulation capabilities in the product design process.

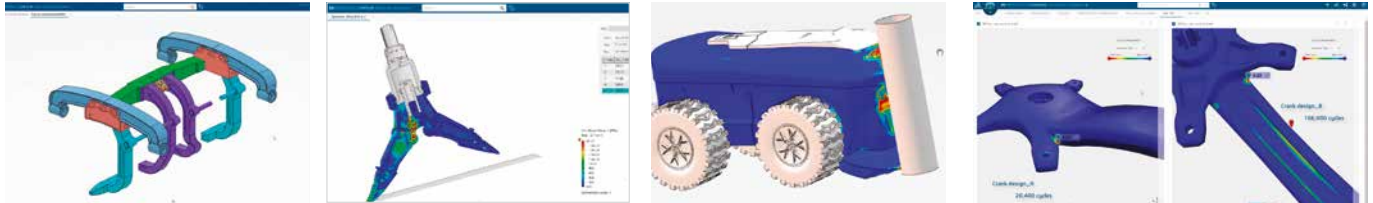
The 3DEXPERIENCE Works Simulation portfolio is the solution for SOLIDWORKS users to access the best-in-class simulation technology from SIMULIA including Abaqus for linear and nonlinear Finite Element Analysis (FEA) of Structures, CST Studio Suite for Electromagnetics simulation, and Simpack for Motion (Multi-body) simulation.

# 3DEXPERIENCE SIMULATION DOMAINS AND ROLES

## STRUCTURE

**Perform structural analysis powered by the proven Abaqus technology with a comprehensive solution to guide design decisions and improve product performance and quality.**

3DEXPERIENCEWorks Simulation provides a scalable set of **structural analysis solutions** for designers and design engineers so they can efficiently assess product performance with complete and scalable capabilities



Scalable Structural Simulation Solution

**SIMULIA Structural Designer** delivers guided workflows to efficiently evaluate stress, strain, natural frequency and temperature during the design process. SIMULIA Structural Designer is an intuitive simulation role for designers with structures that experience static loads with linear material behavior that do not undergo large deformation under load.

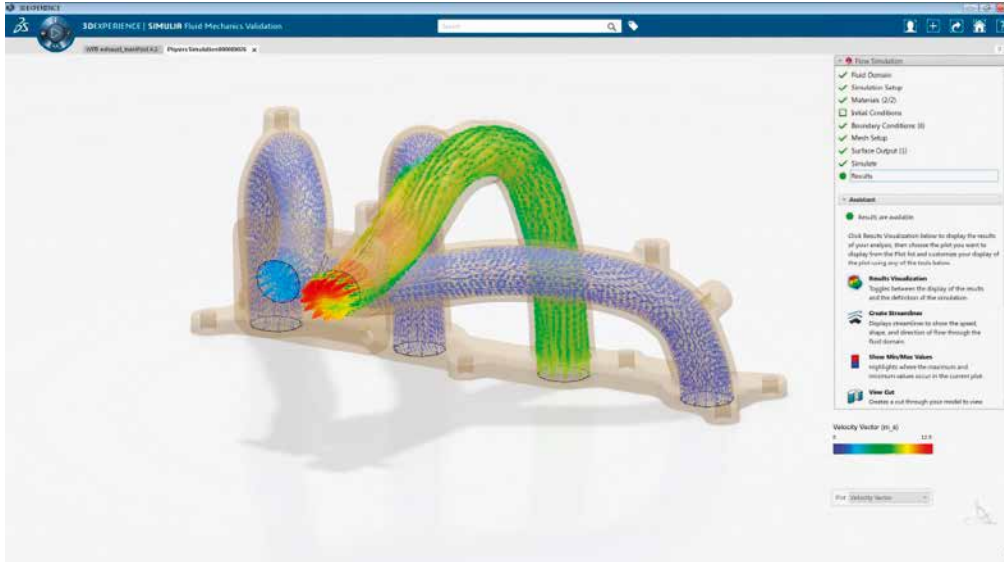
**SIMULIA Structural Engineer** provides design engineers intuitive tools to perform linear structural simulation during the design process. It goes beyond the SIMULIA Structural Designer role with comprehensive simulation modeling and post processing tools as well as additional analysis types such as modal dynamic and harmonic studies. With Structural Engineer, a design engineer can evaluate KPIs of any type of geometry with high quality meshing as well as access to high performance results visualization tools on large models.

**SIMULIA Structural Performance Engineer** includes a comprehensive set of structural analysis solutions to guide design decisions under a wide range of loading conditions. It extends the SIMULIA Structural Engineer role to include Abaqus nonlinear solution techniques for large deformations, contact, and nonlinear materials as well as Implicit dynamic solutions for snap fit and other types of behavior. Large assembly support for these analysis types is made easier with the unique General Contact set up capability. With the Model Assembly application, users can efficiently automate mesh techniques for large, complex finite element models among several engineering teams.

**SIMULIA Durability Performance Engineer** provides all the functionality of the SIMULIA Structural Performance Engineer role, enriched with best-in-class durability analysis capabilities. Durability simulation helps to predict accurate fatigue lives and ensure complex engineering products are designed for durability thus avoiding late re-design, minimizing physical tests, reducing warranty costs, and extending life in service.

**SIMULIA Structural Mechanics Engineer** role is a comprehensive role with the complete power of Abaqus to perform structural integrity assessment of any type of products subjected to a large scope of external conditions. It provides all the functionality of SIMULIA Structural Performance Engineer enriched with advanced and robust capabilities such as nonlinear explicit dynamic simulation for drop test and impact type simulations. The Simulation Model Preparation application empowers users for geometry simplification for simulation purposes in a single environment. The unique Material calibration application allows for calibrating materials with physical test results making the bridge between real and virtual. The Parametric Design Study application empowers users with embedded Design Exploration experience towards the best design alternative based on performance objectives.

**SIMULIA Durability and Mechanics Engineer** extends all the functionality of Structural Mechanics Engineer and adds in the durability analysis capabilities. Durability simulation helps to predict accurate fatigue lives and ensure complex engineering products are designed for durability thus avoiding late re-design, minimizing physical tests, reducing warranty costs, and extending life in service.



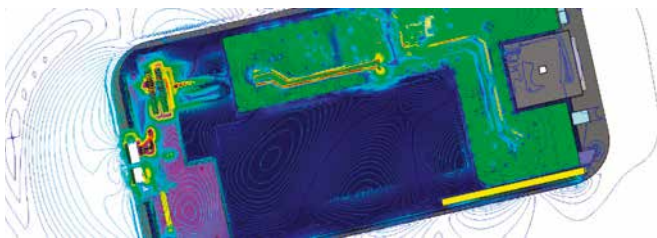
Intuitive and Powerful Fluid Flow Simulation Solution

## COMPUTATIONAL FLUID DYNAMICS

**Perform fluid flow and heat transfer simulations to improve quality and avoid manufacturing issues.**

3DEXPERIENCEWorks Simulation provides a robust and intuitive **Fluid Flow solution** for design engineers so they can efficiently explore fluid flow and thermal performance of products using Computational Fluid Dynamics (CFD) to accelerate product innovation.

**SIMULIA Fluid Dynamics Engineer** provides fluid flow and thermal performance analysis capabilities to help evaluate product alternatives and accelerate product innovation. A guided interface assists the user in setting up the simulation and evaluating the results making the simulation tools within reach of all designers and design engineers. Users can easily predict steady-state and transient flow and thermal behavior of products leading to better quality design. It also empowers users in performing design exploration for a best design with the Parametric Design Study application



Robust Electromagnetic Simulation Solution

## ELECTROMAGNETICS

**Leverage the most comprehensive suite for high frequency and low frequency applications, from static to optical frequencies.**

3DEXPERIENCEWorks Simulation provides an **Electromagnetic solution** for analyzing high and low frequency applications of antennas, microwave components and electro-mechanical devices using CST Studio Suite technology.

**SIMULIA Electromagnets Engineer** provides high performance 3D Electromagnetic Simulation for designing, analyzing and optimizing electromagnetic components. Tight integration with SOLIDWORKS provides seamless evaluation of antenna and microwave designs as well as minimizing EMC/EMI issues, during the design process. This role provides direct access to CST studio Suite leading technology for robust and accurate electromagnetic simulation.



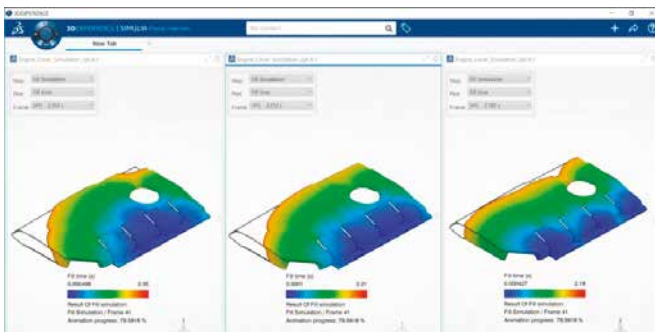
Intuitive Rigid Body Motion Simulation Solution

## MOTION

**Simulate product motion behavior for complex mechanism to drive better design decisions and improve product performance.**

3DEXPERIENCEWorks Simulation provides a **Motion simulation** capability to determine the behavior of complex mechanisms under kinematic and dynamic conditions delivering the power of Simpack technology to SOLIDWORKS users.

The **SIMULIA 3DMotion Creator** role delivers an easy-to-use motion simulation solution within an intuitive, highly interactive, and tightly integrated motion to design environment for a true life-like experience. With this role, designers can quickly define, simulate and validate multiple mechanical designs at an early stage to drive product innovation. They can understand the complete impact of product motion, with 3D animation and kinematic and dynamic results plots.



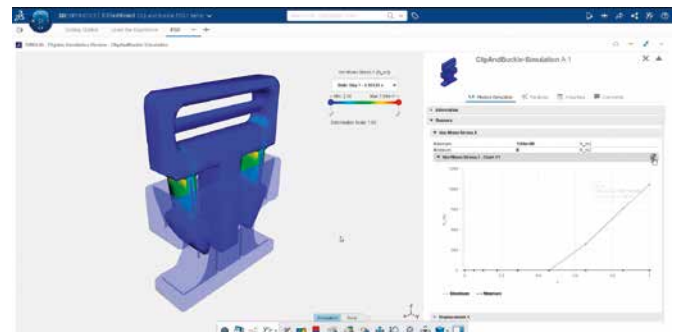
Comprehensive Plastic Injection Simulation Solution

## PLASTIC INJECTION

**Validate and optimize injection molded part designs early in the product development process.**

3DEXPERIENCEWorks Simulation provides **Plastic Injection simulation** capability for analyzing injection molded part designs and ensuring their manufacturability during the product design phase

The **SIMULIA Plastic Injection Engineer** role allows for validation of plastic parts and mold tooling designs by simulating the filling, packing, warpage and mold cooling with an intuitive, guided simulation assistant. The simulation technology helps predict common molding defects including: weld-lines, sink marks, air traps and incomplete filling (short shots).



Unique Collaborative Simulation Review Solution

## SIMULATION REVIEW

**Collaborate with any project stakeholder to make well informed, traceable and data-driven decisions**

3DEXPERIENCEWorks Simulation provides Simulation Review functionality that allows for effective design collaboration within a team and identifying the alternatives that best meet the design criteria

The **SIMULIA Simulation Collaborator** role facilitates collaborative decision making across the organization through the 3DDashboard to review, compare, and perform trade-offs between design alternatives. The browser-based Performance Trade Off application accelerates the selection of the best designs by comparing performance metrics across alternatives and ranking designs based on requirements. Project stakeholders can review and collaborate easily on geometry and simulation results, from anywhere, at any time through efficient Web based browser applications.

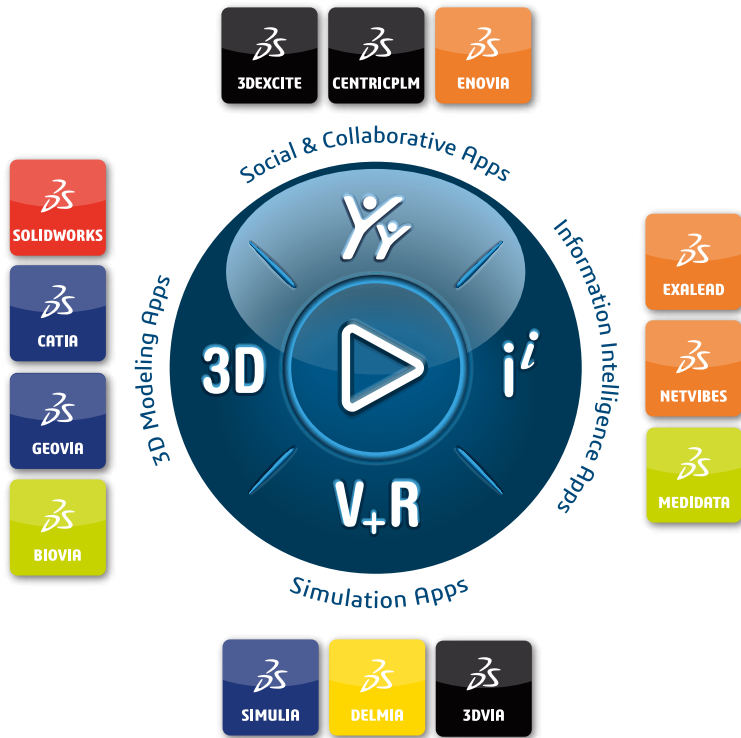


# BOOST ENGINEERING TEAM PRODUCTIVITY AND COLLABORATION WITH THE 3DEXPERIENCE CLOUD ENVIRONMENT

The 3DEXPERIENCEWorks Simulation portfolio offers a unique engineering solution on a cloud-based product development environment.

## KEY BENEFITS

- Single source of truth for all your data removing the potential risk for mistakes
  - Store all your product data in a centralized, secure location and access it from any device without any installation.
  - Perform the Simulation on the right design data without confusion on which data set to use
  - Manage the lifecycle of CAD data, simulation models and documentation across disciplines
- Efficient workflow with SOLIDWORKS Connected
  - Eliminate silos with full integration of design and simulation processes
  - Launch 3DEXPERIENCE simulation applications directly from SOLIDWORKS for a streamlined workflow
  - Leverage SOLIDWORKS Simulation linear and nonlinear structural studies in the SIMULIA apps to reduce the set up process
- Cloud Computing for all
  - Execute Simulation locally or on the cloud in a single environment for a unique user experience
  - Cloud Compute capability is available for all users to remove hardware barriers
  - Cloud compute allows for executing simulations on high performance compute servers, freeing up local resources and shortening the overall time for execution
- Engineering Collaboration for the next generation of Product Development
  - Foster collaboration with secure data storage and sharing, tailored dashboards, social communities and more
  - Easily share simulation data with model and scenario setup and review results in dashboard communities and conversations for interactive collaboration



**Our 3DEXPERIENCE® platform powers our brand applications, serving 11 industries, and provides a rich portfolio of industry solution experiences.**

Dassault Systèmes, the 3DEXPERIENCE Company, is a catalyst for human progress. We provide business and people with collaborative virtual environments to imagine sustainable innovations. By creating ‘virtual experience twins’ of the real world with our 3DEXPERIENCE platform and applications, our customers push the boundaries of innovation, learning and production.

Dassault Systèmes’ 20,000 employees are bringing value to more than 270,000 customers of all sizes, in all industries, in more than 140 countries. For more information, visit [www.3ds.com](http://www.3ds.com).

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