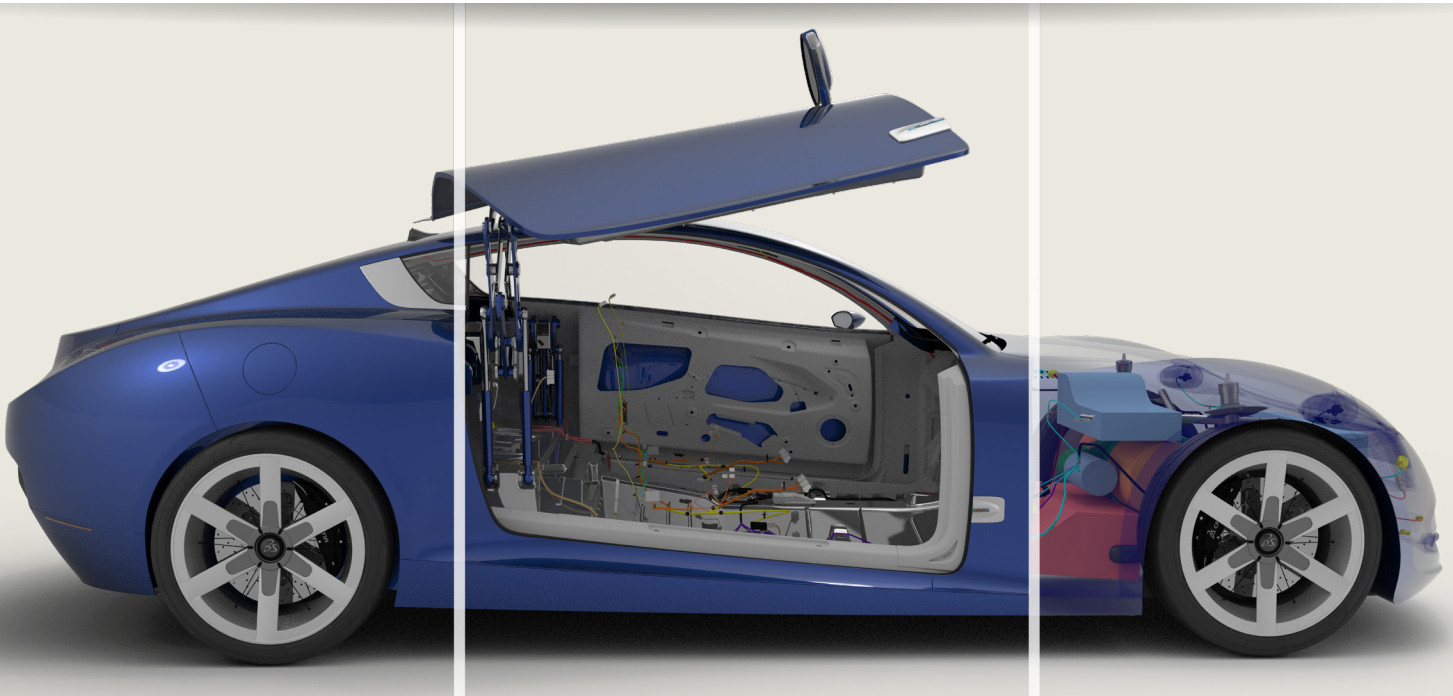**3DEXPERIENCE**

3DEXPERIENCE CATIA RELEASE HIGHLIGHTS-R2019x

Designers   **Engineers**   **Systems Engineers**

THE LATEST RELEASE OF CATIA IS PACKED FULL OF ENHANCEMENTS TO IMPROVE YOUR DESIGN, ENGINEERING AND SYSTEMS PROCESSES.

- *The new 3D Generative Innovator role delivers browser-based, on-the-cloud, generative modeling.*

- *Create in 3D Virtual Reality with CATIA Natural Sketch*

- *The new Product Experience Presenter role creates compelling visual product experiences in 3D.*

- *ICEM Design Experience delivers a new generation surface modelling App.*

- *The Function Driven Generative Designer role has been further improved with even smoother and more regular surfaces.*

- *A new extension role, Function Driven Refinement Designer, enables further refinement.*

- *For AEC, productivity enhancements include the creation of variable curtain walls and increased sophistication in handling rebar for concrete structures.*

- *Systems Engineers can enjoy multiple enhancements and additional roles to make your job easier and more productive.*

For Everyone

3D GENERATIVE INNOVATOR – UNCONSTRAINED CREATIVITY

"3D Generative Innovator" delivers a browser-based on-the-cloud generative modeling environment that uniquely combines graphical visual scripting and interactive 3D-modeling, with the ability to use one or the other interchangeably at any time.

Any 3D Model can also be described by a program/script which defines the 3D elements and the relationships between them. Visual Scripting makes this easier, as it is a visual approach to creating programs by manipulating program elements graphically rather than by specifying them textually (e.g., drag and drop of boxes and links). Using this approach, advanced automation and computational design techniques can be introduced to the parametric model creation process.
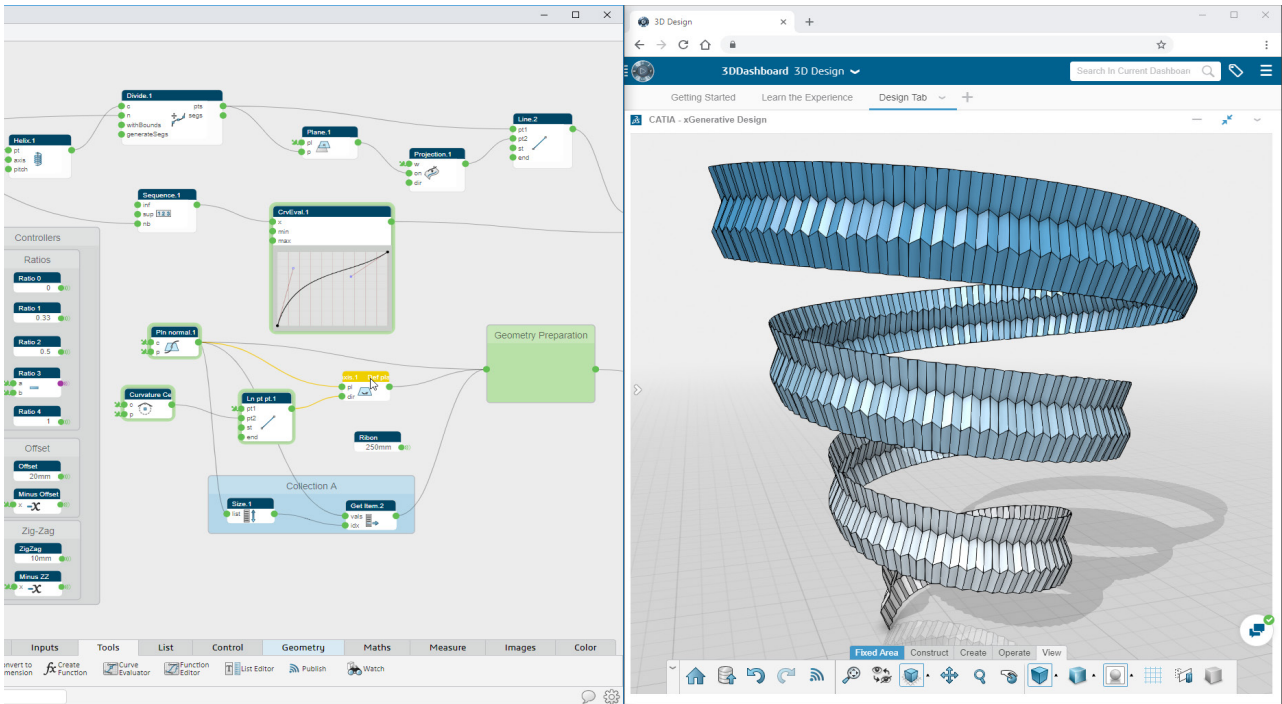
This new, intuitive and smart approach allows creative people in Architecture, Design/Styling and Engineering to quickly design, explore and validate variations of complex, repetitive and non-regular shapes and patterns. All created geometry is available to be used in the world of detailed design and manufacture through the rich portfolio of roles on the 3DEXPERIENCE Platform.

Uniquely, at any stage of the design, the user can swap freely between the graph and the interactive 3D, as these are bi-directionally dynamically sync'd. For instance, the user can start a command in the interactive 3D environment and finish it in the graph or vice-versa. The benefit is even more artistic creativity and productivity,
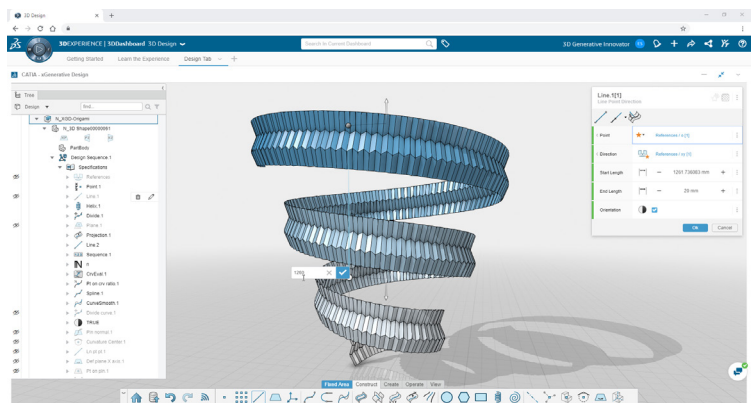
For Designers

IMMERSIVE DESIGN EXPERIENCE WITH 3D NATURAL SKETCHING

With R2017x, we introduced immersive virtual reality fully integrated in CATIA and available naturally in an instant. In R2018x, we extended that to VR collaboration so teams could experience the product together in real time.

Today with R2019x, we take a further step which brings the immersive experience to the hands of the designer, with the ability to create in 3D Virtual Reality using CATIA Natural Sketch.

This new way of 3D Sketching extends the ability to express and communicate creativity and to transform 2D ideas into a 3D reality.

Now designers can simply plug-and- play their HTC Vive head mounted display to jump into VR directly from their 3D Sketching App to immediately design in 3D. A new immersive user interface, allows the designer to 3D sketch and model directly in the 3D VR space with an immersive experience.
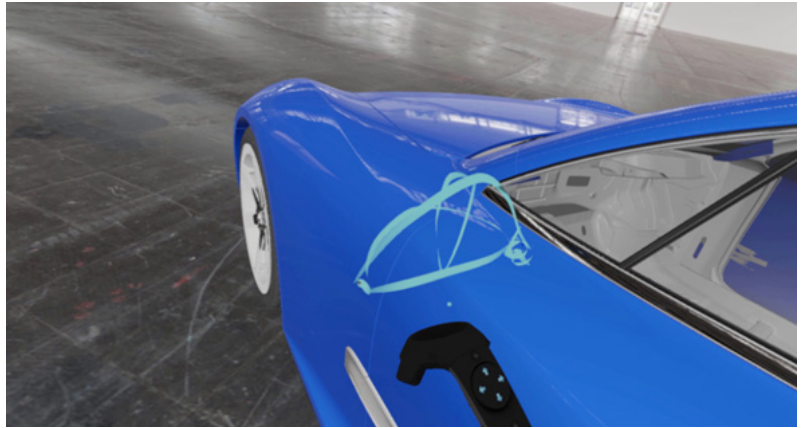
NEW ROLE & APP. TO CREATE & PLAY 3D VISUAL EXPERIENCES FOR COMPELLING STYLING PRESENTATIONS
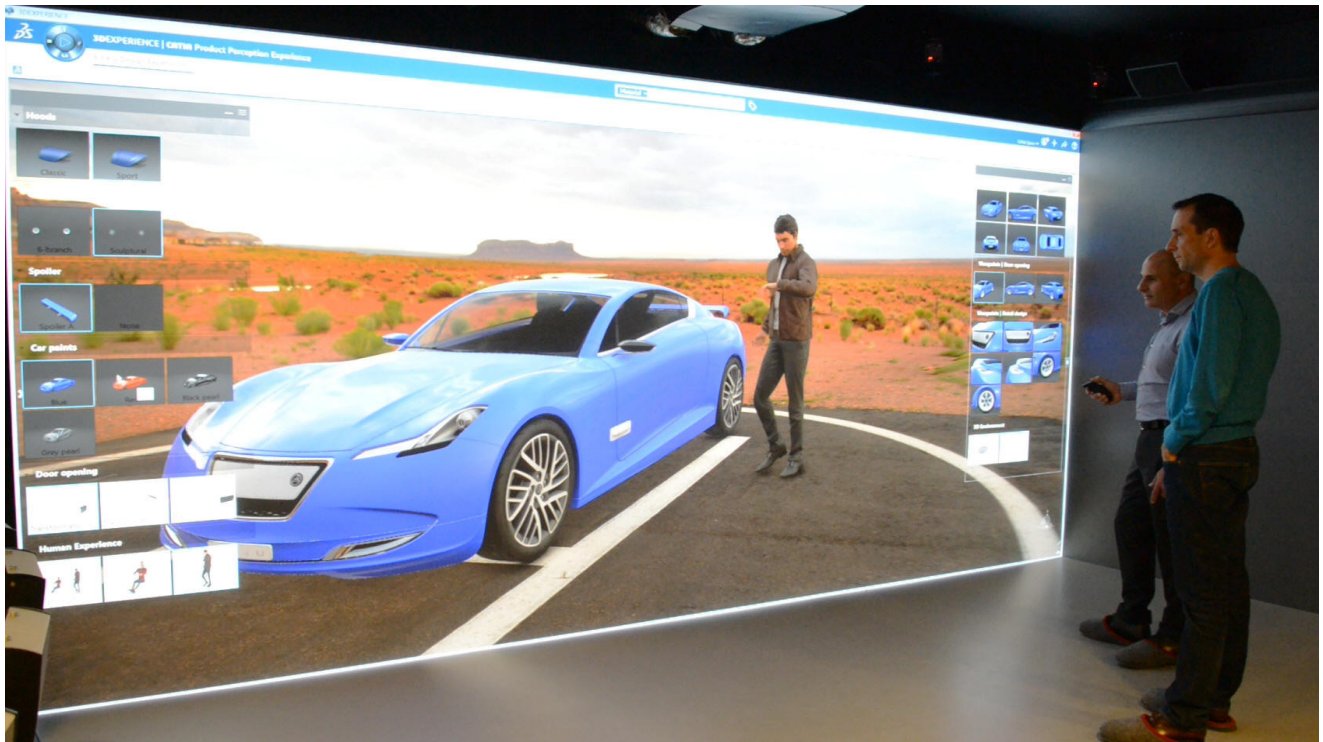
A new role, "Product Experience Presenter", enables the creation of compelling visual product experiences in 3D, for more effective and professional styling presentations, design explorations and reviews.

The user can quickly and simply set up a design review experience with styling variants, packaging options, animations, views and configurations. The presentation can be enriched with ambiences, environments, lighting and behaviors.

The experience can then be played, switching between and exploring alternatives in real time.

Product Experience Presenter helps creative designers to explore in 3D many design variants and combinations. It allows creative teams to brainstorm together, live in 3D, on multiple design possibilities. Full integration with the design data and high quality and accurate visualization leads to improved communications and better decisions across all disciplines. The presenter can leverage touch-screens for effective presentation, and, with the Immersive Visual Experience role, VR is available.

ICEM DESIGN EXPERIENCE

R2019x introduces ICEM Design Experience, a new generation of surface modeling App. for Computer Aided Styling (CAS) and Class-A surface modelers.

The innovative user experience delivers new levels of productivity, innovation and collaboration:

Productivity

ICEM Design Experience provides an intuitive and optimised user experience to accelerate the creation and sculpting of high quality surfaces.

Based on the best in class and proven ICEM technology, and in collaboration with industrial user champions, we have designed the next innovative solution for surface modelling.

This new user experience is based on an innovative approach to user interaction and selection of surfaces, and a new user interface. Both are optimized for surface modellers, boosting their productivity and flexibility to create and shape surfaces.

Innovation

A new "OMNI" smart technology, inside several features, recognises and predicts the designer's intent, based upon his geometry selection. For example, the OMNISurf feature, based on the number and 3D position of curves, will generate the right surface, for example flange, blend or sweep.

ICEM Design Experience also introduces innovative commands and features, including sculpting laws, Greville points (control points) and global deformation. These combine with a new reverse engineering workflow that accelerates the overall hybrid-design process.

Collaboration

With ICEM Design Experience, CAS and Class-A surface modellers can now seamlessly connect with the enterprise on the 3DEXPERIENCE platform, taking advantage of full digital continuity across the product development process.

For Engineers

## *FUNCTION DRIVEN GENERATIVE DESIGN*

The "Function Driven Generative Designer" role, allows non-specialist designers to automatically generate optimized conceptual parts and assemblies from functional specifications. The designer simply provides a set of requirements, including the 3D envelope, connections, the loading scenario, material, weight reduction targets for lightweight engineering, and the desired manufacturing process, either traditional, such as milling, casting or forging, or additive manufacturing.
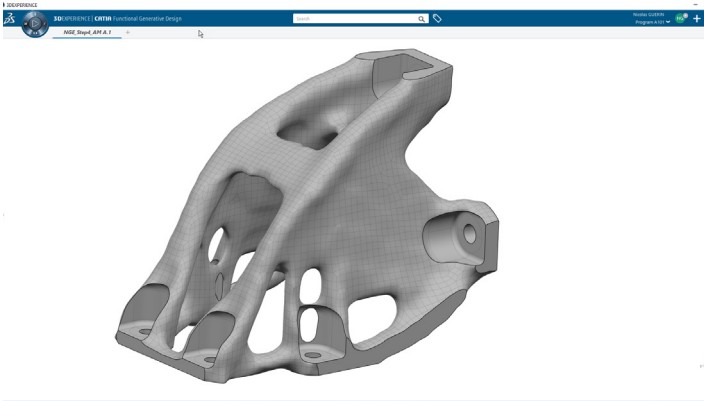

The push of a button runs a simulation and generates the optimized concept assembly shapes. The geometry created by the optimization is class-leading in quality, consisting of real CATIA surface geometry, usable directly in all other CATIA roles.

In CATIA R2019x, this geometry quality is further improved with smoother and more regular surfaces.

New functionality is also introduced to better control the design of optimized parts to be produced through the milling process. The specifications of the milling process, such as the milling directions, the initial block, and the tool diameter are used to determine the various profiles, for the outer shape and inner pockets.
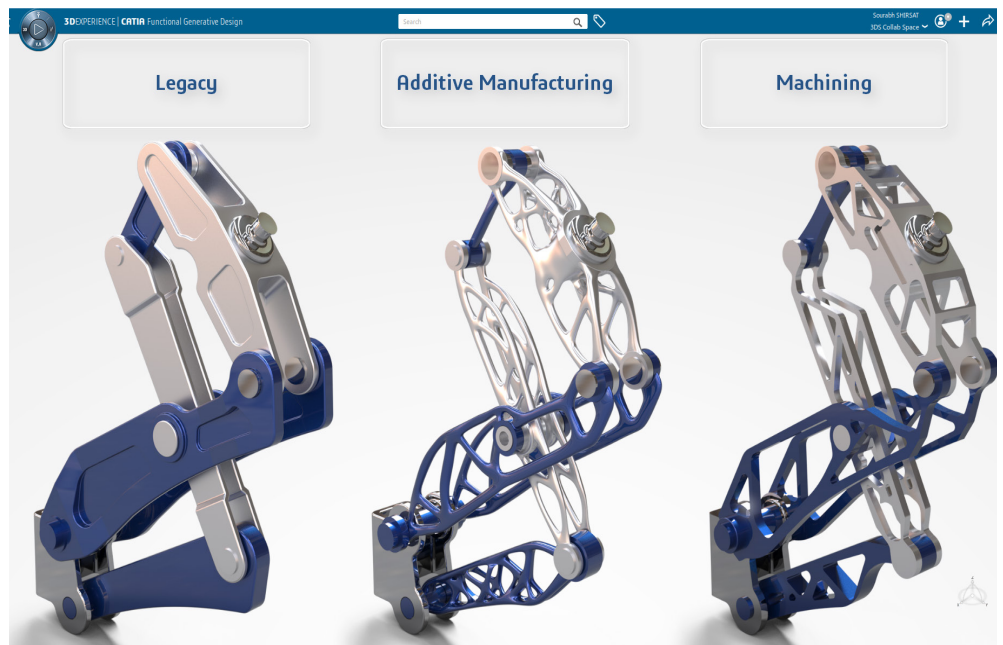
The new extension role,
"Function Driven Refinement Designer", allows you to further refine and converge the optimized shape, globally or locally,

without re-running the full optimization. This can be achieved by:
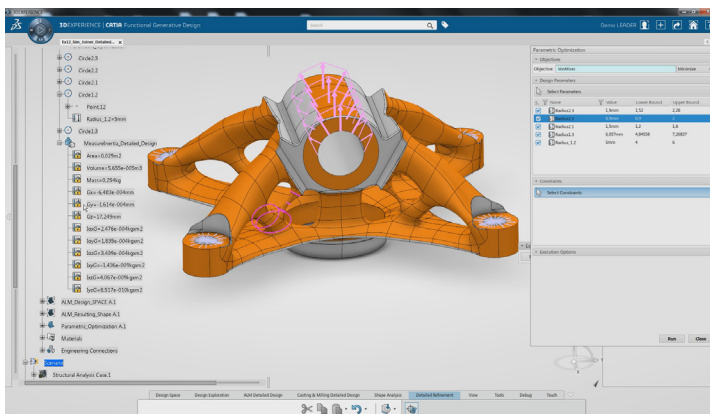
1. Parametric optimization convergence: After the automated generation of the concept shape, the user can choose select geometric parameters to tune from the 3D model, set an acceptable range for each one of them and then run an incremental optimization.

2. Further optimization of the shape: the software optimizes the outer shape to lower the stress peaks, without the need to specify explicitly which geometric parameters to vary. This can lead to a bulkier shape in stressed areas, and if possible, a thinner shape in lightly loaded areas. Typically, such a shape modification reduces fatigue and enhances the durability of the part.

ARCHITECTURE ENGINEERING AND CONSTRUCTION

R2019x further enriches the industry-focused **3D**EXPERIENCE CATIA solution for Architecture Engineering and Construction, which addresses all participants in the end-to-end building process.

This release delivers multiple new advanced capabilities for Facade Design and Structural Design.

The "Concept Building Designer" role brings many enhancements, including the creation of variable curtain walls, which consist of repeating patterns of glass panels and mullions. Designers can create multiple parametric repetitive patterns (e.g. a staggered brick pattern) that can be applied associatively across different regions of the building and can be layered on the same surface, in order to create rain screens or multi-layered facades. This new level of automation increases productivity in both the creation and modification of the design.
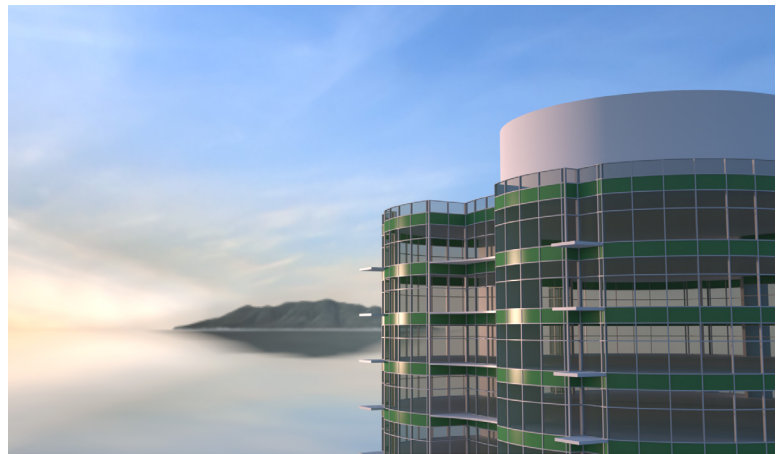

Building Structure Designers will benefit from increased sophistication in the handling of rebar for concrete structures (e.g. split rebars and couplers between bars) and the introduction of steel plate members to design composite steel structures. These 3D features bring further automation and efficiency to the design and engineering process
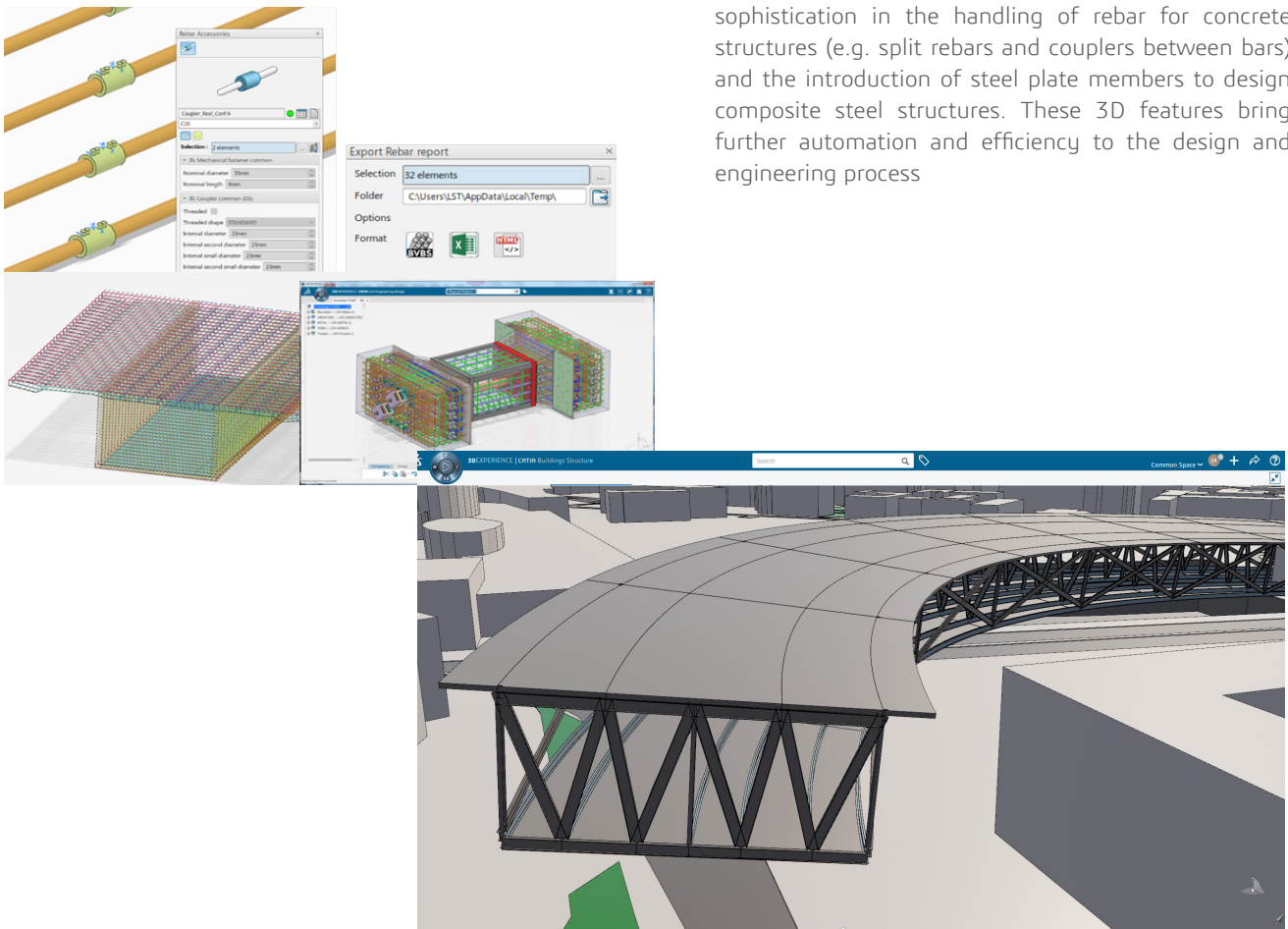
For Systems Engineers

CYBER SYSTEMS ENGINEERING
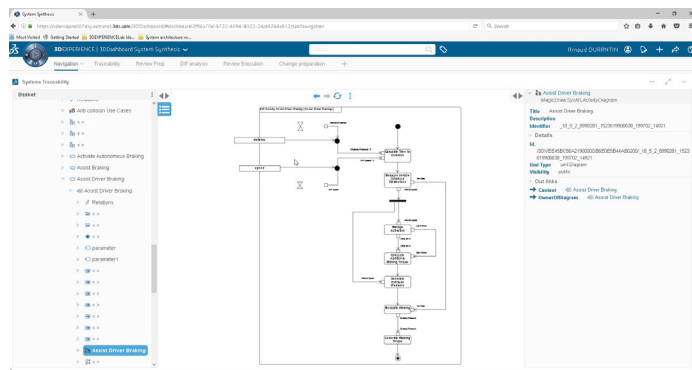
The extended Cyber Systems Engineering solution provides digital continuity to design, validate and experience mechanical, electronic and software systems within a systems engineering approach.

From the **3D**EXPERIENCE Platform, systems architects and managers can navigate/track existing No Magic models of business process, architecture, software and systems. No Magic was acquired by Dassault Systemes in June 2018.

A new role, "Virtual Systems Experience Designer", enables the integration of 3rd party models. Through

FMI integration, we can bring together models from different modeling tools such as: Modelica, C++, Matlab Simulink and Control Build. By combining these models, we can now control and play the combined system experience to better understand the realistic behavior of the total system. The co-execution can be driven directly, by scenario files or in real time through a human machine interface (HMI)
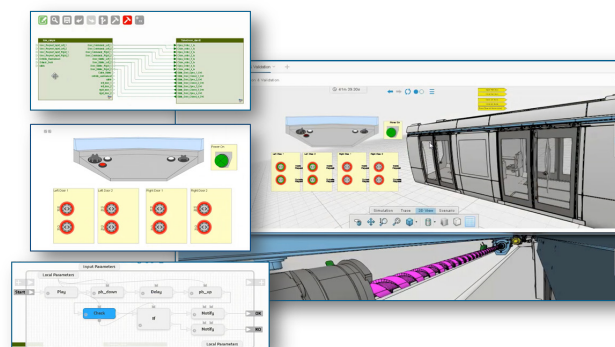
Also in R2019x, the "Electrical and Electronics Architect" role has been enriched to address the A&D processes for this discipline.
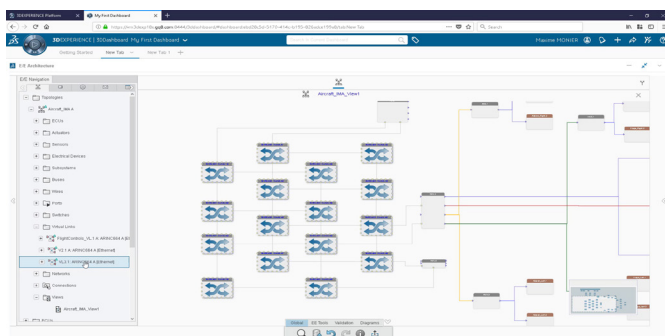
Click here to watch and short video summary of the CATIA R2019x Highlights

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

Dassault Systèmes, the **3D**EXPERIENCE® Company, provides business and people with virtual universes to imagine sustainable innovations. Its world-leading solutions transform the way products are designed, produced, and supported. Dassault Systèmes' collaborative solutions foster social innovation, expanding possibilities for the virtual world to improve the real world. The group brings value to over 210,000 customers of all sizes in all industries in more than 140 countries. For more information, visit **www.3ds.com**.

3DEXPERIENCE®

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