Altair 2020: The most significant release in the company's history

On June 3 and 4, 2020, Altair held its Altair 2020 Global Experience virtual conference to release an expanded range of solutions in all products for all user types. *MechChem Africa* summarises the opening presentation by James Scapa, chairman, founder and chief executive officer of Altair; and presents chief technical officer (CTO) James Dagg's take on enhanced integration in the new release.

A global pioneer in simulation-driven product development software, high-performance computing (HPC), and data analytics, Altair has updated all of its software products, which have been enhanced with advancements in terms of user experience and countless new features, including intuitive workflows that empower users to streamline product development, allowing customers to get to market faster.

The update expands on the number of solutions available for designers, engineers, data analysts, IT and HPC professionals, facility managers and more. It broadens the scope of the new user experience, enables access to more physics, data analytics and machine learning and makes the Altair software delivery method more flexible and accessible.

"Our teams are always driven to develop and provide access to a range of different technologies that enable our customers to break through complex problems and explore and discover on their own terms," said James Scapa, chairman, founder and chief executive officer of Altair. "This software update release is the largest collection of our applications for design, simulation, and data analytics."

In the opening Altair 2020 presentation, Scapa noted that Altair is no longer a company specialising only in simulation. "The vision for the company is really about transforming company decision-making: using simulation, but also with data analytics and high-performance computing (HPC) – and this envelope really makes Altair different," he believes.

Looking to the future, Scapa sees algorithms and mathematics driving decision making, not just in engineering, but also in business, commerce and "in all aspects of life and society."

Scapa reveals that, as well as simulation, physics solvers, and design modelling and visualisation tools, in recent years Altair has acquired and developed data analytics expertise and tools, along with high performance and cloud computing and industrial internet of things (IIoT) capabilities.

In the future, Scapa sees increasing convergence of these simulation, data analytics, and high power computing solutions as the world moves towards "smart connected everything" technologies. "We are living in a smaller world where strong user experiences

Altair CEO, James Scapa.

are driving product value," he says. Simulation, data driven design models, and high performance computing, all working in concert, are likely to "make the difference."

By 2022, more than half of our new business systems will have continuous intelligence, capturing data and using machine leaning models to constantly upgrade and automate decision making – and the HPC market is expected to be between US$22- and $44-billion by 2025. "These are hot areas that are growing fast.

"Today, we have open source deep machine learning algorithms that can be applied to real engineering problems giving accurate results. These can also be summarised and stored as solution repositories, which can avoid having to re-simulate similar future problems. The combination of simulation; mixed, multilevel machine learning models; and human creativity lead us to expect superfast solutions and multi-disciplinary optimisations that prove very accurate when applied in real life," says Scapa.

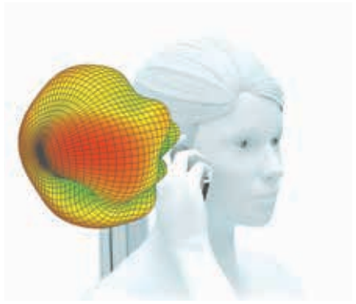
Why Altair for simulation? Already offering best-in-class simulation and visualisation the new releases of Altair's solutions offer smarter than ever product design, spectacular ease of use, and a host of increasingly integrated interoperable solvers and software solutions.

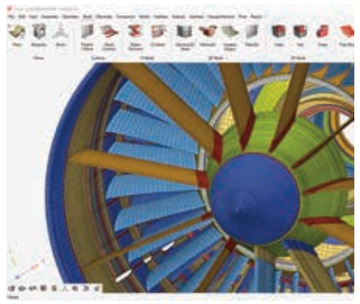
As an example, Scapa lifts out the Altair SimSolid™ solver, which is now integrated into Altair Inspire™ enabling the evaluation of support and connector reaction forces and instantaneous reaction time modelling for large PolyNURBS, which significantly simplifies and improves the geometry generated from optimisation.

He also highlights Altair's recent acquisition and integration of EDEM, the market-leading discrete element modelling-based software solution for bulk material flow, which can quickly and accurately simulate and analyse the behaviour of bulk materials such as coal, mined ores, soils, tablets and powders. "Along with multibody dynamics simulation and hydraulics, EDEM is an ideal add-in for heavy equipment and agricultural applications," notes Scapa.

With respect to Altair's data analytics capabilities in the new release, he highlights Altair Panopticon™, the platform for user-driven monitoring of real-time data that includes a major update of cloud-based deployment. "Panopticon enables users to build, modify, and share custom-designed functions and content easily via standard web browsers." For data analytics, "it offers an end to end pure cloud native solution".

And for HPC and cloud computing, Altair Access™ offers updated work-from-home features; more responsive 3D remote visualisation; better job resource charts; two-factor authentication and single sign-on; and mobile phone share support. In addition, Altair Accelerator™, the high-throughput, enterprise-grade job scheduler is now 10x faster for dynamic workloads with support for the likes of Microsoft Azure, Google Cloud (GCP), Amazon Web Services (AWS) and Oracle Cloud; while Altair PBS Professional™ offers scalability improvements towards exascale, Cray Shasta support, container enhancements for converged AI and HPC workloads and better system maintenance support.





Left: *The new releases of Altair's solutions offer smarter than ever product design, spectacular ease of use, and a host of increasingly integrated interoperable solvers and software solutions.* ***Right:*** *Altair Hyperworks™ 2020, with enhanced multi-physics and simulation tools such as OptiStruct, offers "on-demand flexibility to access Altair's entire portfolio with freedom, flexibility and value."*

"We offer HPC solutions that are user friendly and highly robust, with the latest open source MPI interface and throughput rates that are suitable for short runs using a single CPU to very large and complex multi-processing applications," says Scapa.

Also included in the software update release is the introduction of Altair Units, a flexibly tiered pricing model. "Altair Units offers users the freedom to scale and compute from anywhere, using their own hardware or the cloud.

"We believe we can offer unparalleled value to suit each user's personal and different subset of tools, from industrial designers less familiar with software design tools to mechanical designers familiar with the likes of Altair Hyperworks™ and the multi-physics analysts and simulation specialists. The model offers on-demand flexibility to access Altair's entire portfolio with freedom, flexibility and value," he adds.

"And we are coupling Altair Units with Altair One, our new common app-based delivery platform, which makes our whole offering, including software, add on tools and customer support available from a single online-platform," Scapa concludes. ❑

The integration of SimSolid into Inspire

"We're committed to accelerating innovation by breaking down barriers to design and making high-performance simulation more accessible," says Altair's CTO, James Dagg.

Altair Inspire™, the fully integrated topology optimisation and rapid simulation solution defines the concept of simulation-driven design. Instead of being used exclusively for validation, simulation has become integral to the entire process. As a result, users can and should test more alternatives at the earliest possible stage of development to identify the most efficient solutions faster. Inspire makes it easy to realise these benefits, because it can be learned in just a few hours.

Altair CTO, James Dagg.

Altair's commitment to both simulation-driven design and design democratisation made the acquisition of Altair SimSolid a perfect fit. As many readers will appreciate, SimSolid represents a ground-breaking approach to structural analysis. With accuracy that has been independently verified by NAFEMS, it enables simulation of complex assemblies directly from CAD files. The skilled and time-consuming tasks of geometry fixing and meshing are eliminated. Results are delivered in seconds or minutes, rather than hours or days.

The integration of SimSolid into Inspire is therefore a logical progression – and exactly what users will find in the latest Altair 2020 release of Inspire. Alongside the proven industry solvers, Altair MotionSolve™ (multi-body system simulation) and Altair OptiStruct™ (structural design and optimisation), Inspire now provides seamless support for a third, SimSolid.

Within Inspire, users can make design changes directly on their models without having to go back to the original CAD system. Interactive design modifications such as geometry edits, dimensional changes – and part replacements – can now be immediately re-analysed on the fly with the SimSolid solver.

Inspire can also run simulations on a laptop or a workstation and has no need for expensive graphics processing units (GPUs) for it to solve large problems fast. The benefits extend throughout the design community. By putting fast simulation within reach of all engineers, product leaders will cut development costs and time to market and, by running more iterations themselves rather than having to refer to simulation specialists, product engineers will be able to make better design decisions.

And going forward, even more SimSolid functionality will be embedded within Inspire, which means unleashing the creative capabilities of more people for many more successful product design and development cycles. ❑