ANSYS 2019 R3 Expands Autonomous Vehicles Solution

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PITTSBURGH, Sept. 10, 2019 /PRNewswire/ -- With today's release of ANSYS Autonomy, part of ANSYS 2019 R3, ANSYS (NASDAQ: ANSS) enables engineers to develop safer autonomous vehicles (AVs) through advanced closed-loop scenario simulation, automated driving and control software development, functional safety analysis, and sensor, camera, lidar, and radar simulation.

V2X_communication_for_autonomous_vehicles

As fully autonomous vehicles edge closer to real-world deployment, operating safely becomes more critical than ever. AVs require rigorous testing in complex environments and under variable conditions. Physical testing would require billions of miles of driving or flying — a time-consuming, cost-prohibitive, approach. Using simulation to virtually test AVs is the only viable option for validating systems safety and accelerating AV development. From sensors to virtual environments to artificial intelligence (AI), ANSYS 2019 R3 includes robust offerings that speed the safe development and deployment of AVs on the road and in the air.

"In ANSYS 2019 R3, ANSYS Autonomy integrates ANSYS flagship products into a comprehensive virtual testing and development environment for AVs," said Eric Bantegnie, vice president and general manager, systems business unit at ANSYS. "Combined with ANSYS' comprehensive partner ecosystem, our leading-edge solutions enable customers to accelerate the future of safe autonomous driving."

Among many product and feature enhancements across the ANSYS product portfolio, ANSYS 2019 R3 extends the ANSYS® SCADE™ family of products with the launch of ANSYS SCADE Vision, which enables customers to evaluate the safety of AI-based perception software systems and reduce object detection defects in autonomous systems. ANSYS SCADE Vision drastically reduces the cost of AV perception software testing, enhances safety and drives high value from AV data. ANSYS SCADE Vision is powered by Edge Case Research Hologram technology.

With this new release, ANSYS® SCADE Suite™ enhances important features required for developing the most advanced automotive systems and the embedded software that controls these systems for autonomous vehicles. ANSYS 2019 R3 includes improved AUTOSAR support in SCADE for ISO 26262 certified code generation and software component design.

In addition to ANSYS SCADE Vision and ANSYS SCADE Suite, ANSYS 2019 R3 includes multiple tool enhancements to ANSYS VRXPERIENCE Driving Simulator powered by SCANeR™, ANSYS VRXPERIENCE HMI, ANSYS® SPEOS™ and ANSYS® HFSS™ SBR+.

Updates to ANSYS VRXPERIENCE provide innovations in scenario simulation, sensors, sound simulations and virtual reality (VR); the software also now offers SPEOS Live Preview. ANSYS VRXPERIENCE HMI now allows users to run and interact with embedded software in VR as a software-in-the-loop model. These updates to the ANSYS VRXPERIENCE product family enable developers to virtually simulate and validate numerous scenarios without the cost of physical prototypes or physical road miles.

ANSYS SPEOS now enables users to see optical simulation in a new light. While ANSYS SPEOS continues to extend optical simulation into ANSYS' Multiphysics platform, SPEOS Live Preview helps designers accelerate their design innovation thanks to GPU acceleration, enabling quick design iterations to improve design optimization and robustness. ANSYS 2019 R3 also includes the SPEOS Road Library for Sensors Simulation, a comprehensive retro-reflecting materials database.

"ANSYS SPEOS provides early insights into the optical performance of our designs. It allows for fast iterations on multiple virtual prototypes to optimize the appearance and performance of vehicle lamps, earlier in the product design phase," said Hiroaki Yachi, Chief, Toyota Customizing & Development. "With SPEOS Live Preview, powered by GPU technology, our engineers can run real-time optical simulations and explore alternative virtual prototypes — reducing costs and development times."

In ANSYS 2019 R3, ANSYS electromagnetics suite includes new features for engineers tackling complex autonomous vehicle engineering challenges. ANSYS HFSS SBR+ now includes creeping wave physics – an industry first – that delivers greater accuracy for predicting radar cross section (RCS) of large targets with curvatures — enabling engineers to achieve a more precise RCS reading of objects including shadow regions. Additionally, Accelerated Doppler Processing simulation technology added to ANSYS HFSS SBR+ revolutionizes the way automotive companies validate the safety and performance of radar systems in autonomous vehicles — empowering engineers to test vastly more traffic scenarios than would ever be possible with physical road tests.

ANSYS also introduces ANSYS Minerva. Powered by Aras, ANSYS Minerva is a knowledge management product for critical simulation expertise. ANSYS Minerva improves productivity and maximizes business value from existing engineering technology investments by providing model-based system engineering, simulation process and data management, lifecycle traceability, process integration, design optimization and simulation-driven data science capabilities. ANSYS Minerva is critical for managing the volume of simulation data required for testing complex systems, such as AVs.

The ANSYS semiconductor portfolio of power efficiency, power integrity and reliability solutions achieve ISO 26262 certifications to enable automotive integrated circuit designers to meet rigorous safety requirements for AV applications. Auto chip makers can leverage ANSYS® PowerArtist™, the ANSYS® RedHawk™ family and ANSYS® Totem™ multiphysics simulations for all ISO 26262 safety-related projects for any ASIL level. ANSYS RedHawk-SC continues to deliver power integrity solutions for leading semiconductor process technologies for automotive and 5G applications.

Beyond ANSYS Autonomy, additional enhancements to the ANSYS product portfolio in ANSYS 2019 R3 include:

Simplified Workflows in Flagship Products

ANSYS® Mechanical™ is more powerful than ever with the full integration of ANSYS Motion, the addition of Sherlock Automated Design Analysis Software™ and the new coupled field analysis systems.

"Our team is using the new ANSYS Mechanical to develop press brake and panel bender machines and their bending technology," said Matthias Hörl, simulation engineer at TRUMPF Maschinen Austria GmbH & Co KG. "More intuitive and powerful than its predecessor, the new ANSYS Mechanical user interface enables faster model setup and enhances productivity."

"ANSYS Motion has the power to streamline and improve the overall CAE process here at Piaggio," said Riccardo Testi, CAE analyst at Piaggio. "ANSYS Motion's tight integration with the other ANSYS products can streamline our procedures and enable our teams to simulate quickly evolving events."

"The exposure of coupled field elements capability in ANSYS Mechanical is a great productivity improvement for us eliminating the need for elaborate custom code for each simulation," Florentina Popa, modeling and simulation engineer, BiSN. Our simulations depend upon mapping of Fluent data, use of nonlinear material models and strongly coupled thermal-structural analysis. The new release makes the setup of these complex multiphysics problems a breeze."

With this latest release, ANSYS Cloud incorporates on-demand computing within more applications in the ANSYS product portfolio. Building upon existing support for structures, fluids and high frequency simulation tools, ANSYS® Maxwell® and Q3D Extractor® can now easily submit jobs to secure high-performance compute infrastructure on Microsoft Azure, significantly reducing turnaround time for compute-intensive electromagnetic problems.

"The ANSYS Cloud service built into ANSYS Mechanical provides intuitive, easy-to-access to HPC directly from the application," said Marcos Blanco Figueras, Mechanical Simulation Engineer, Lear Corporation. "For large, high-fidelity models, ANSYS Cloud reduced our solve times by 5-6X and cut the entire simulation workflow by half."

The launch of Distributed Compute Services (DCS), a new family of applications, enables users to distribute, manage and solve simulations on a variety of compute resources. DCS empowers users to more effectively use compute resources across operating systems, networks and locations – maximizing simulation investment with design optimization.

BMC Switzerland AG uses DCS technology to engineer world-class race winning bicycles. "The results of this project were imperative for the success of the brand," said Stefan Christ, head of R&D at BMC Switzerland AG.

In the Fluids suite, ANSYS® Fluent™ has a new user experience that enables engineers to complete more Computational Fluid Dynamics simulations in less time and with less training. This release further simplifies the user experience and broadens its use to new applications.

INDAR used ANSYS Fluent's task-based meshing workflow to greatly accelerate their hydroelectric generator simulations. "Preprocessing time has been reduced from six to eight days to four hours and solving time has been slashed by 30%," said Itsaso Auzmendi Murua, thermal research engineer at INDAR.

Additionally, in ANSYS 2019 R3, a new automated workflow speeds the ANSYS Fluent adjoint solver so users can easily find the optimal shape for given operating conditions. Fluent users can also quickly and easily evaluate very complex reduced order models and post-process results directly within Fluent to gain even more insight when exploring design alternatives.

Faster Problem Solving Across Product Portfolio

The ANSYS® Discovery™ family continues to bring simulation upfront in the design process by making powerful analysis accessible to every engineer. In ANSYS 2019 R3, the Discovery family introduces generative design capabilities through the first interactive topology optimization tool with groundbreaking speed and ease-of-use that finds optimal designs in minutes.

"ANSYS Discovery helps us quickly and accurately take the guess work out of designs early in the concept process; allowing us to explore more options through non-traditional engineering techniques, like generative design," said Patrick Wilson, CEO at RaceShapes. "With time savings at the early stages, we're spending more time on the details, and accelerating the process of going from prototype to production."

"ANSYS Discovery has literally cut our design time in half," said Mike Berry, director of engineering, Moffitt Corporation. "With the ability to do rapid design exploration paired with 'real-time' simulation, we're able to leverage Discovery at the beginning of our sales process. Discovery provides the right level of detail for a preliminary design, and quick, iterative communication with our customers."

ANSYS® Multiphysics™ continues to build on previous releases. In ANSYS 2019 R3, ANSYS Multiphysics can now simulate electro-thermal management problems, such as those seen in motors and busbars, to include cases with 3D transient ANSYS Maxwell analyses. Performance and accuracy are also improved — testing on industrial strength cases demonstrates a 15% speedup of system coupling and faster co-simulation than previous releases.

With ANSYS® medini analyze, ANSYS extends its functional safety analysis expertise beyond automotive and aerospace to industrial equipment with a new safety domain profile for industrial applications according to IEC 61508 in medini.

In the Additive suite, ANSYS® Additive™ family improves capabilities across all products to simplify workflows, enable multiple supports and support removal — streamlining the additive manufacturing process.

The new release of GRANTA Materials Data for Simulation provides easy access to additional material property data, now embedded within ANSYS® Electronics Desktop™ as well as ANSYS Mechanical. ANSYS 2019 R3 also introduces ANSYS® GRANTA Selector™, a refreshed and renamed update to CES Selector, the industry-leading materials selector tool for product design or development.

For more information about the features and enhancements available in ANSYS 2109 R3 visit www.ANSYS.com/r3.

About ANSYS, Inc.

If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge or put on wearable technology, chances are you've used a product where ANSYS software played a critical role in its creation. ANSYS is the global leader in engineering simulation. Through our strategy of Pervasive Engineering Simulation, we help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and create products limited only by imagination. Founded in 1970, ANSYS is headquartered south of Pittsburgh, Pennsylvania, U.S.A., Visit www.ansys.com for more information.

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Contact Media: Mary Kate Joyce, 724.820.4368, marykate.joyce@ansys.com

Investors: Annette N. Arribas, IRC, 724.820.3700, annette.arribas@ansys.com

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