Ansys and NVIDIA to Demonstrate New Era of In-Silico Cardiovascular Research at GTC

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Ansys and NVIDIA unveil vision for the future of cardiovascular research by democratizing simulation

/ Key Highlights

- Ansys and NVIDIA's open-source technology narrows the gap between simulation and reality by enabling customized workflows, fostering collaboration, and making simulation more accessible to non-experts
- A Python library, known as "PyAnsys-Heart" will enable partial and whole anatomical heart models in Ansys LS-Dyna® nonlinear dynamics multiphysics simulation software
- Using NVIDIA NIM™ microservices to build an AI-based speech-to-text code generator, Ansys empowers experts and non-experts to easily render photorealistic simulation results within OpenUSD-based applications with NVIDIA Omniverse
- Ansys is announcing plans to support NVIDIA's Isaac for Healthcare AI robotics platform by leveraging its high-fidelity, multi-modality, and multi-scale physics and physiology simulation tools and software to deliver applications and solutions

PITTSBURGH, March 18, 2025 /PRNewswire/ -- Ansys (NASDAQ: ANSS) and NVIDIA today unveiled a new technology framework enabling customers to design tailored solutions using the power of AI, advanced simulation, and physically-based visualization. Converging Ansys and NVIDIA open-source technologies narrows the gap between simulation and reality by enabling customized workflows, fostering collaboration, and making simulation more accessible to non-experts. Ansys applied this framework to demonstrate how it can empower clinicians to quickly analyze human heart anatomies in extreme detail — equipping them with deeper insights to make more informed decisions. The companies will jointly demonstrate this research at NVIDIA GTC in San Jose, CA March 18-21.

PyAnsys is a collection of open-source Python libraries that bridge Ansys tools and the Python scripting language, making it easier to run simulations, modify geometries, and process results automatically. NVIDIA NIM — a set of inference microservices for developers to easily deploy AI models — enables Ansys users to connect with large language models (LLMs), in this case via a chatbot. Prompting the chatbot with specific queries about the model triggers the LLM, trained with selected PyAnsys libraries, to auto-generate customized PyAnsys code. This ultimately enables high-fidelity simulation and visualization within applications built on NVIDIA Omniverse, allowing non-experts to forgo learning the underlying complex system of tools needed for simulation.

Customers across industries can harness the value of this technological framework. Simulation users can script existing models with Python and train an LLM for context-specific learning, empowering non-experts to obtain the same simulation insights more easily through a customized or chat-based user interface.

The demonstration at GTC showed how the framework can enable tailored treatments and outcome predictions for those with cardiovascular disease — the leading cause of death in the world. From within the "PyAnsys-Heart" library, a clinician can ask the chatbot, "What does my patient's heart look like?" "PyAnsys-Heart" will generate code for that specific patient's heart, enabling a partial or full anatomical model in LS-DYNA. The model can then be visualized in an application developed with Omniverse for visualization, unlocking insights that could have otherwise been inaccessible.

"As a surgeon we have plenty of expertise in dealing with the common cases," said Dr. Francis Bessiere, cardiac electrophysiologist at Louis-Pradel Cardiovascular and Pulmonary Hospital. "However, the exciting promise of combining computational technologies like simulation, visualization, and AI becomes clear when we can predict which cases will be challenging and prepare the health system to optimally care for the more complex patient cases."

This collaboration also sets the foundation for Ansys and NVIDIA to jointly leverage new tools and workflows for creating high-fidelity, multi-modality, multi-scale physics and physiological simulation for use with NVIDIA Isaac for Healthcare. Isaac for Healthcare is an AI robotics development platform that helps developers safely and efficiently design, test, and deploy advanced AI-driven robotic and autonomous systems specifically for healthcare settings and applications.

"Ansys is committed to helping its customers innovate, and that means enabling rapid testing and deeper insights to instill confidence in product performance," said Prith Banerjee, chief technology officer at Ansys. "It also means that simulation should be accessible by more than a few specialists within an organization. Ansys and NVIDIA recognize this, and our open ecosystem approach to digital engineering and product development sets the standard for collaboration, and as evidenced by our demonstration, has transformative potential for cardiac care and beyond."

"The collaboration with Ansys is foundational to accelerating the next generation of medical imaging and robotics," said Rev Lebaredian, vice president of Omniverse and simulation technology at NVIDIA. "The power of advanced GPU computing, physical AI, and simulation will shape the future of personalized healthcare."

Visit Ansys at NVIDIA GTC in San Jose, CA March 18-21, Booth #224 to learn more about its advanced physics solvers and see exciting demonstrations.

/ About Ansys

Our Mission: Powering Innovation that Drives Human Advancement™

When visionary companies need to know how their world-changing ideas will perform, they close the gap between design and reality with Ansys simulation. For more than 50 years, Ansys software has enabled innovators across industries to push boundaries by using the predictive power of simulation. From sustainable transportation to advanced semiconductors, from satellite systems to life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.

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