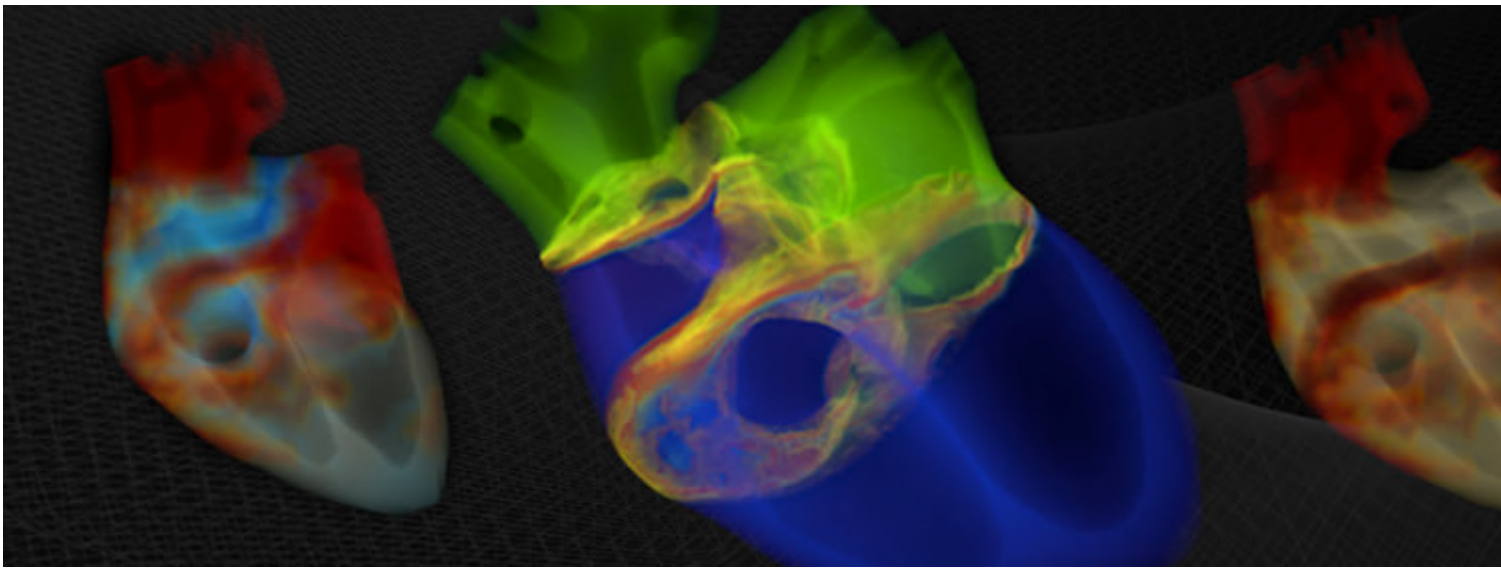
BSC and NVIDIA a step forward to the interactive simulation of humans

An in-situ visualization of the cardiac model implemented with ALYA code and NVIDIA IndeX scalable software solution demonstrates the power of HPC simulations in GPU-accelerated clusters



The demonstration has been shown with a real-time high-quality rendering at NVIDIA GTC17 Conference

NVIDIA and Barcelona Supercomputing Center have presented a real-time interactive visualisation of a cardiac computational model that shows the potential of HPC-based simulation codes and GPU-accelerated clusters to simulate the human cardiovascular system.

At the NVIDIA GTC17 conference in San Jose (CA, US), BSC and NVIDIA bring together Alya simulation code and NVIDIA IndeX scalable software to implement an in-situ visualization solution for of electro mechanical simulations of the BSC cardiac computational model. While Alya simulates the electromechanical cardiac propagation, NVIDIA IndeX is used for an immediate in-situ visualization. The in-situ visualization allows researchers to interact with the data on the fly giving a better insight into the simulations.

Alya is an HPC-based multiphysics simulation suite developed at the Barcelona Supercomputing Center, which is the core component of a cardiac computational model. In this model, BSC simulates the electromechanical propagation through the heart, which in turn contracts the cardiac muscle, which in turn pumps the blood in and out of both ventricles and atria.

The NVIDIA IndeX scalable software solution for scientific visualization can make use of the tremendous

computing capabilities GPU-accelerated clusters and HPC systems feature today. NVIDIA IndeX's scalability enables real-time high-quality rendering of large-scale data at any dataset resolution and combines this with novel in-situ technologies.

With this joint solution BSC and NVIDIA are getting closer to a real Computational Human, a virtual lab capable of simulating and display a whole human thanks to HPC and In-Situ Visualization.

A vast range of possibilities for biomedical research

The ability to simulate these large-scale complex problems combined with a fast visual inspection of the massive computational data produced in an interactive environment opens a vast range of possibilities for biomedical research. Among them, it enables the design of optimized medical devices, it accelerates the way towards better-personalized drugs or it allows to explore new healing therapies. All of these comes together with a strong decrease in time, money and animal testing.

Thanks to computational power, the future of medicine becomes its present and science fiction becomes science.

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