

PRESS RELEASE

Design simulation redefined

What if, instead of waiting 60 minutes for the results of a simulation, it only took 45 seconds? At Hannover Messe, Fraunhofer IGD will present RISTRA, a GPU structural mechanics solution that accelerates component simulation and optimizes the design process.

(Darmstadt/Hanover) The demands on design results are becoming more and more complex. In addition to ensuring component function, the question of material usage is becoming increasingly relevant in times of additive manufacturing. On the path toward the optimal design, a wide array of parameters are modified by just fractional amounts. Being able to determine at a glance the effects of changes in structural mechanics after each step is often still wishful thinking with today's simulation software.

Last year, the Fraunhofer Institute for Computer Graphics Research IGD introduced a preliminary version of its structural mechanics solution RISTRA (Rapid Interactive Structural Analysis), which pushes the processing of the simulation onto the graphics card, thereby significantly compressing simulation time. In its 2019 update, licensed by software developer Meshparts, RISTRA produces results even more quickly. Visitors to the Fraunhofer joint stand at the Hannover Messe trade fair will have the chance to watch how RISTRA explores the high-dimensional parameter space of a configured component, then simulates and evaluates that component in real time. Find out how the software tool accelerates design and engineering processes, and can serve as the basis for component optimization.

The decision to license RISTRA as a fundamental part of its simulation software was not an easy one for Meshparts GmbH. "Fraunhofer IGD's approach persuaded us with its extremely fast solution behavior and precise results. We're excited by the possibilities offered our users by interactive simulation. Fraunhofer IGD will stand by us as a partner when it comes to implementing the new solution in a user-friendly way. We're proud to be the first to bring interactive simulation with this kind of performance to the market," said Sales Director Timo Ziegler.

A leap in technology for the design process

Behind the development of RISTRA was a vision of using simulation to assist in the design of a component while at the same time testing its stability, all in a single work step, thereby making possible a direct, intuitive work method. The

PRESS RELEASEMarch 12, 2019 || Page 1 | 3

**Fraunhofer IGD
at Hannover Messe
2019**

April 01–05, 2019

Fraunhofer-Gesellschaft joint stand
Hall 6, Stand A30Stand of the Federal
Ministry for Economic Affairs and
Energy **Hall 2, Stand
C28**

FRAUNHOFER INSTITUTE FOR COMPUTER GRAPHICS RESEARCH IGD

PRESS RELEASE

results are better results, not only in terms of required development time but also in terms of design quality.

In the new 2019 version, developers were able to push all simulation computing onto the GPU. The operations for generating the set of linear equations—several million equations are no exception, depending on the complexity of the design—were specially optimized for computation by the graphics processor. By exploiting the massive parallel computing capabilities of affordable commercial graphics cards, the effects of given loading cases on the component's structure are visualized in false color in near-real time. In a comparison test, RISTRA computed a model with more than 1.3 million finite elements more than 80 times faster than a commercial simulation software program.

More information:

<https://www.igd.fraunhofer.de/en/veranstaltungen/hannover-messe-2019>
<https://www.igd.fraunhofer.de/en/press/news/latest-generation-simulation>
<https://www.igd.fraunhofer.de/en/competences/technologies/interactive-simulation>

PRESS RELEASE

March 12, 2019 || Page 2 | 3

Fraunhofer IGD at Hannover Messe 2019

April 01–05, 2019

Fraunhofer-Gesellschaft joint stand
Hall 6, Stand A30

Stand of the Federal
Ministry for Economic
Affairs and
Energy **Hall 2, Stand
C28**

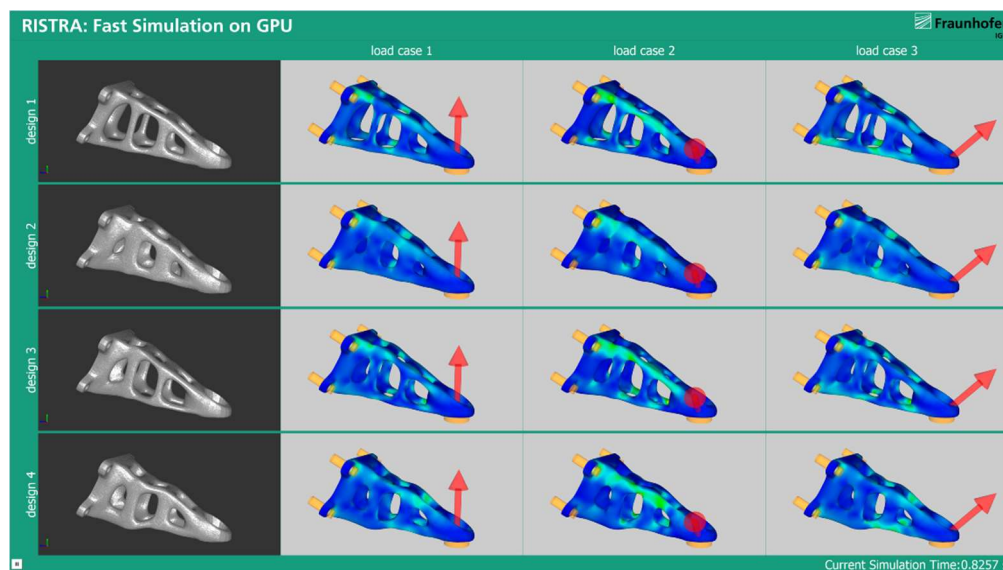


Image: A false-color model simulates weakpoints in a design.

PRESS RELEASE

PRESS RELEASEMarch 12, 2019 || Page 3 | 3

Institute Profile

Founded 30 years ago, Fraunhofer IGD has become the world's leading institution for applied research in the field of visual computing. Visual computing means image and model-based IT. In simple terms, it describes the capability of transforming information into images (computer graphics) and extracting information from images (computer vision). The numerous application scenarios include human/machine interaction, interactive simulation, and modeling situations.

Our developers at the sites in Darmstadt, Rostock, Graz, and Singapore develop new technical solutions and prototypes all the way up to the market readiness stage. In collaboration with our partners, this results in application solutions that are custom-tailored to customer requirements.

Our approaches facilitate the work with computers and are efficiently used in the industry, in everyday life, and in the healthcare sector. Our research highlights includes assisting people in the Industry 4.0, the development of key technologies for the Smart City, and the use of digital solutions in the field of Individual Health.

Through applied research, we support the strategic development of the industry and economy. Especially small and medium-sized enterprises as well as service centers can benefit from this and be successful on the market with the help of our leading technologies.