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Safe on the road: How WaveCam optimizes vehicle designs

What happens when a car door slightly bends in the wind, or a tire deforms minimally at high speed? Answers to such questions are critical for the safety and comfort of modern vehicles. With its WaveCam analysis software, gfai tech GmbH has developed an innovative tool that visualizes physical forces—delivering clear results and easy-to-understand evaluations.

In daily driving, car doors and tires are constantly subjected to stress: from road surface obstacles such as potholes or curbs, to strong gusts of wind or high speeds on the highway. To precisely analyse these stresses and the resulting deformation dynamics, gfai tech combines state-of-the-art measurement technology with WaveCam analysis software. The insights gained feed into the development of safer designs. WaveCam's detailed analysis supports the selection of materials that better absorb or dampen vibrations, making a decisive contribution to overall vehicle safety. Simultaneously, this optimization ensures a more comfortable and pleasant driving experience for all passengers.

"Minimal movements or vibrations are invisible to the human eye—whether it's vibrations transmitted through the door structure to the windows or the spring action of a tire," explains Philip Höhna, CEO of gfai tech." Our WaveCam software makes these subtle vibrations visible." Every pixel in a video recording acts as a sensor. The software tracks the movement of each pixel over a defined period and visualizes it in animated 2D or 3D representations," Höhna adds. This allows hundreds of thousands of measurement points to be captured, analysed, and made visible to the human eye simultaneously.

Another advantage: all that's needed for measurements are a camera, a laptop, and WaveCam software. With a high-speed camera, vibrations at higher frequencies can be captured precisely, while smartphone video data suffices for lower frequencies. The analysis takes only a few minutes and offers a cost-effective alternative to traditional measurement systems like laser vibrometers and accelerometers, which require complex setups.

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WaveCam also proven invaluable in the construction industry, such as analysing hand-arm vibrations or examining building structures. Explore our innovative measurement system for the dynamic analysis of deformations in car doors and tires here.

About gfai tech

gfai tech GmbH is a German company specializing in innovative sound and vibration measurement and analysis solutions. We offer advanced Acoustic Cameras, comprehensive analysis software, and cutting-edge structural dynamics solutions. Our expertise spans various industries, helping customers achieve noise reduction, false detection, sound design improvement, and precise vibration monitoring. As a subsidiary of GFaI e.V., we provide unique hardware, software, and customized customer solutions backed by global support.

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High resolution images can be provided upon request.