VIC-3D **9** with *iris*
Exclusive Features

The VIC-3D digital image correlation (DIC) system from Correlated Solutions is the most powerful turnkey system for non-contact measurement of full-field surface shape, deformation, strain, vibration, and much more. With a range of new features including direct data comparison of finite element analysis (FEA) and a new graphics engine called iris, the VIC-3D system is poised to change the way engineers around the world validate models and share their results. The following features are exclusive to the VIC-3D system and make it truly unique.

U.S. Technical Support Team

Correlated Solutions is the only developer of 3D digital image correlation systems based in the United States. All of our digital image correlation systems are designed and built by our team in Columbia, South Carolina. Because we develop all the software and design these systems ourselves, we are able to provide technical support that is unsurpassed in this industry. All systems include unlimited technical support via phone and email from our experienced support team, in addition to an extensive, free, and online knowledgebase.

Processing Speed

The VIC-3D analysis code has been recently updated to take advantage of high-end multi-core CPUs. For example, up to 250,000 data points/sec can now be processed using the intel i9 2.6 GHz 18 core CPU and up 500,000 data points/sec is possible using the AMD Threadripper™ 32 core CPU.

VIC-3D has been shown to be approximately ten times faster than other 3D digital image correlation analysis software. Processing speed is particularly important for long image sequences, such as for vibration analysis. Consider a vibration test that is set up to measure operating deflection shapes (ODSs) using the VIC-3D HS system and FFT module. A typical test with ~2,000 image pairs containing 50,000 data points per time step will take approximately 6 minutes to process with VIC-3D, where other DIC software could take up to 1 hour or more.

Full-field, Real-Time Measurements

The VIC-3D Real-time Measurement System is capable of displaying over 10,000 data points at up to 10 Hz using a modern desktop PC with a single CPU. Users can freely choose the data density for processing rates between 2-10 Hz. Live data is displayed in an unlimited number of user specified 3D plots, 2D contour image overlays, and point extractions displayed graphically.

VIC-3D *iris*

VIC-3D's graphic engine '*iris*' is a new way to view, show, and present data. Designed from the ground up, this user-friendly interface allows for smooth animations using custom text, 2D and 3D contour plots, graphical data extractions, and imported VTK sequence data. Full-field experimental data can be directly compared to FEA data in *iris*, allowing engineers to quickly validate models. Pre-installed templates are included, and custom templates can be created, saved, and shared for quick and easy data reporting. All of this can be exported to high resolution PDFs or videos optimized for high definition 4K displays.

Contact our Sales Team to explore the range of industry-leading digital image correlation systems from Correlated Solutions.

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Variable Ray Origin (VRO) Calibration

The VRO calibration feature corrects for changes in the refractive index between the speckle pattern and a stereo camera pair. This is especially useful when viewing a specimen through one or more panes of glass (e.g., a viewport of a heating chamber) and in bio-medical applications, where the sample is oftentimes submerged in a liquid. While a standard calibration procedure cannot remove the bias that leads to significant errors in shape, deformation, and strain data, implementing the VRO calibration model leaves data with no discernible bias.

Separate Calibration for Deformed Images

In some cases, it is necessary to dismantle the camera system between the time that the reference images and the deformed images are taken. VIC-3D has a feature that allows a separate calibration to be used between the reference and deformed states.

Hybrid Calibration

VIC-3D includes a new calibration feature which utilizes speckle images to improve the stereo calibration model. This new method has shown to increase the accuracy of the system and reduce bias.

Calibration Disturbance Correction

The VIC-3D system uses a precise calibration of the camera positions in order to provide the most accurate 3D measurements possible. During normal field and laboratory use, the cameras can occasionally be disturbed by either environmental factors such as wind or ground vibration or by accidental contact.

To preserve data integrity, VIC-3D includes a Calibration Disturbance Correction feature that automatically recalculates the stereo cameras' positions after a disturbance occurs before or during testing, ensuring data accuracy. Because the disturbance correction feature uses information from the acquired speckle images from the test, it does not require any additional calibration images and can be performed after the system has been dismantled.

Advanced Calibration Options

VIC-3D includes advanced calibration options which can be customized and saved for future test setups. These options are useful for complex optical setups, such as high-magnification or when imaging through complex medium. This gives the user the ability to select and combine multiple distortion orders from various models such as radial, prismatic, and tangential, providing complete control over the calibration parameters used.

Stereo Microscope Distortion Correction

Correlated Solutions has developed and patented an easy-to-use calibration procedure that corrects for the complex distortion fields present in stereo-microscope DIC systems. These distortions cannot be modeled accurately using traditional stereo-calibration techniques due to the unique optical paths imaging through a single high-magnification objective lens. Without this correction, severe bias shape and deformation data will result. The stereo-microscope distortion correction algorithm solves this problem.

Flexible Licensing

The computer provided with the system is equipped with a permanent software license for image acquisition and for the post-processing analysis software. In addition, each system includes a free post-processing license on a USB dongle. This allows data analysis and report preparation to be performed on any other Windows PC. Additional post-processing licenses are available for purchase, including network capable licenses.

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