

3D Optical Microscope Imaging System (#6136)

3D imaging software providing greater resolution of samples for analysis

This microscope and imaging system is a powerful tool for the study of multi-scale experimental mechanics of various complex material systems, with applications in engineering and quality control, as well as in biological and materials research. This full-field, 3D microscope and imaging system was developed in part by combining the Diffraction-Assisted Image Correlation (DAIC) technique with optical microscopy. The system can be implemented as an add-on to the photoport of a microscope to enable full-field 3D measurement. The computer system includes a display running software. The system can be used with a wide variety of processors, memory types and media, hardware, software, firmware, wired or wireless connection, user interfaces and devices, or as a combination of computing devices. Operations can be carried out over a website.

Benefits/Advantages

- **Versatile** — Analyze several small scale samples
- **Easy-to-use** — Decoding of the 3D information is straightforward and involves only 2D digital image correlation (2D-DIC) calculations or other types of 2D displacement analysis
- **Accurate** — High measurement accuracy (sub-pixel accuracy of ~10)

Potential Commercial Applications

- Engineering and quality control
- Biological and materials research
- Biomechanics, micromechanics and nanomechanics
- Study of deformation and failure mechanisms of complex material systems

Background/Context for This Invention

Three-dimensional, full-field deformation, and morphology measurement is widely used in many industrial and research applications. However, current microscope imaging software does not provide clear enough images of smaller length scales. The growing fields of biomechanics, micro-mechanics, and nano-mechanics make such micro-scale analysis increasingly important.

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More Information

U.S. Number:

Publications

For more information about this technology, please visit:

<https://licensing.research.gatech.edu/technology/3d-optical-microscope-imaging-system>

Images:

