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Autofocusing Method for High-resolution 3D Profilometry

This technology uses an autofocusing feature on electronically tunable lenses to generate highly accurate 3D images by scanning through an object using discrete focal planes calibrated to a geometric model, thereby enhancing 3D portrayals of dynamic surfaces.

Researchers at Purdue University have devised a method of generating highly accurate 3-dimensional images using an autofocusing feature on electronically tunable lenses. Current methodologies for 3-dimensional image generation rely upon cameras focused on a single focal plane, and therefore do not allow accurate portrayal of the 3-dimensionally of highly dynamic surfaces. The new method developed by Purdue University researchers' scans through the object using discrete focal planes with an electronically tunable lens. These discrete focal planes are calibrated to a geometric model. A subsequent 2-dimensional autofocusing method is utilized and input into the geometric model for 3-dimensional image generation. This technology has exhibited increased accuracy, resolution, and range from contemporary 3D reconstruction methods and has the potential to revolutionize the medical and industrial robotics fields by providing a method of enhancing 3-dimensional portrayals of dynamic surfaces over contemporarily used methods.

Advantages:

-High precision 3D Reconstruction

Potential Applications:

-Medical field

-High precision inspection

-Additive manufacturing

TRL: 3

Intellectual Property:

Technology ID
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Category
Robotics & Automation/Perception & Sensing
Artificial Intelligence & Machine Learning/3D Optical Imaging & Industrial Metrology

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