Image processing algorithm for high-performance 3D image reconstruction

Technology #cu12199

Image reconstruction of 3D objects from digital images has been hindered by the complexity of light illumination present in the real world. This technology is a rigorous image processing algorithm that can reconstruct complex real world scenes more accurately than current state-of-the art approaches. With this technology, high performance image recovery is achievable with wide applicability to a range of fields including surveillance, robotics, archaeology, and surgery.

Light projection technique overcomes real-world light illumination limitations to achieve fast, high quality image reconstruction

Conventional image reconstruction techniques are often unable to appropriately reconstruct real world scenes due to idealized assumptions that lead to systematic image processing errors. This technology takes into account the complexities of light illumination and depth of field to attain a robust algorithm for image reconstruction. The algorithm projects high frequency, narrow bandwidth sinusoidal patterns onto the image, producing results that are spatially invariant to the effects of defocusing and global illumination (i.e. illumination from objective reflections and scattering). As a result, image reconstruction is possible with fewer images. With this technology, image reconstruction an order of magnitude better than state-of-the art approaches has been achieved.

The superior image reconstruction performance of the technology has been demonstrated by simulation.

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Applications:
- Shape reconstruction for 3D models
- Real world scene reconstruction for surveillance
- Image reconstruction for artifacts in archaeology
- Image reconstruction for real-time surgery procedures
Advantages:

- Faster image reconstruction
- Superior image quality
- Robust to complex real world scenarios such as global illumination and limited depth of focus

Patent information:

Patent Pending (WO/2013/078349)

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Related Publications:


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