Stereo Image Acquisition By Lens Translation

Tech ID: 30024 / UC Case 2012-409-0

SUMMARY

UCLA researchers in the Department of Mechanical and Aerospace Engineering have developed a novel single-objective lens stereo imaging setup for endoscopic applications.

BACKGROUND

Stereo imaging tools are widely used by many fields in industry, medicine, cinema, and engineering, where 3D visual information is acquired by using 2D images captured from different viewing angles. To do this, most stereo imaging tools require the use of multiple optical channels to achieve slightly different viewing angles around the object of interest, thereby increasing the overall size and structural complexity compared to single-lens imaging systems. Stereo imaging devices that can decrease the size as well as the structural complexity will be valuable for medical applications, such as endoscopy, where the size of the tool is a main concern.

INNOVATION

UCLA researchers led by Professor CJ Kim have developed a novel single-objective lens device to generate stereo images that enhances the operator's visual perception without increasing the device's size. By eliminating the need for multiple optical systems, the overall device size and structural complexity is reduced, decreasing the manufacturing cost. This imaging device is easily integrated with an endoscope or can turn a conventional optical system into one with stereo imaging capabilities. This innovative imaging instrument can provide depth information and greatly increases the inspection and manipulation performance in hard-to-reach areas.

APPLICATIONS

- Endoscopes
- Stereo imaging tools

ADVANTAGES

- Single-lens
- Low manufacturing cost
- Can turn an optical system into a stereo imaging device
- Easily integrated with an endoscope
- Inspection and manipulation in hard-to-reach areas

STATE OF DEVELOPMENT

A miniaturized device has been manufactured and tested for endoscopic applications. Future directions include further developing the technology in a real endoscopic environment.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10986983	04/27/2021	2012-409

RELATED MATERIALS

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INVENTORS

- Kim, CJ

OTHER INFORMATION

KEYWORDS

stereo imaging, single-objective lens, single lens, endoscopy, endoscopic imaging, single-lens endoscope, medical imaging, 3D imaging

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Biotechnology**
  - Health
- **Engineering**
  - Engineering
  - Other
- **Imaging**
  - 3D/Immersive
  - Medical
- **Medical**
  - Devices
  - Imaging
- **Sensors & Instrumentation**
  - Medical
  - Other

RELATED CASES

2012-409-0

▶ W. Choi, G. Sigal, V. Rubtsov, and C.-J. Kim. A Micro Translating Lens Unit for Stereo Imaging Through Single-Image Endoscope. Proc. IEEE Int. Conf. MEMS. 2012.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Methods of Restoring and Maintaining Gas Film on Superhydrophobic Surfaces while Underwater
- Complete Transfer of Liquid Drops by Modification of Nozzle Design
- Method of Fluid Manipulation By Electrodewetting
- A Built-In Mechanism Of Gas Maintenance In Microfeatures On A Submerged Surface
- No-Assembly Devices for Microfluidics Inside a Cavity
- Liquid-Repellent Surfaces Made of Any Materials
- On-chip, Real-time Feedback Control for Electrical Manipulation of Droplets
- Micropumping of Liquids by Directional Growth and Selective Venting of Bubbles

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