

EYE FUNDUS 3D CAMERA

DESCRIPCIÓN DE LA INVENCIÓN

Fundus eye is used to refer to the posterior pole of the eyeball, especially the retina, the macula and optic nerve. Its test is usual to detect eye diseases. It can also detect diseases not linked directly to the eye, such as diabetes or hypertension. The most common ophthalmic devices for non-invasive examination of fundus eye are the ophthalmoscope and the fundus camera, which are very useful for a first diagnosis and monitor of retinal pathologies. However, these devices provide flat images, and do not provide information about the topography of the fundus eye. They also produce eye fatigue to the patient when the observation is prolonged. Other more sophisticated equipment allow high resolution and contrast reconstructions. However, these devices have a high cost and the resulting images are monochromatic. Likewise, the time required for performing one of these tests can be raised, with consequent visual fatigue for the patient.

Researchers from Universitat de València in collaboration with AIDO, have developed a new camera that allows to obtain three-dimensional photographs of the fundus eye with polychromatic light, with high resolution, with full parallax and without produce eyestrain to the patient. These images can be projected on a monitor of integral imaging. It gets a topographic map of the fundus eye with high capacity of segmentation. This capture system includes an ophthalmoscopic lens, a microlens array and a sensor. With this technology, comfortable and rapid testings for the patient will be obtained. With a single shot from the camera, it is captured the information to display a large number of prospects of the fundus eye in horizontal and vertical directions. This new fundus eye camera will allow to obtain 3D imaging of the fundus eye of high resolution and low cost. This will facilitate the access of primary care centers to these devices, allowing thus early detection of certain eye diseases.

BUSINESS APPLICATION SECTORS

Health: The invention is applicable to optics and ophthalmology fields to capture 3D images of the fundus eye, namely retinal camera manufacturers.

TECHNICAL ADVANTAGES AND BENEFITS

The main advantages provided by the invention are:

- High resolution image in comparison with that obtained with the conventional ophthalmoscopes and fundus cameras.
- It presents horizontal and vertical parallax
- It allows real reconstruction of 3D image of the fundus eye
- Low cost in comparison with high-resolution equipment.
- It allows doing extensions on a 2D image generated from the integral picture.
- It generates color 3D images of the posterior pole of the eye
- Quick and comfortable test for the patient, with a single camera shot a large number of horizontal and vertical prospects of the fundus eye are captured.
- It provides a large viewing area, from 15 ° to 110 °.

DEVELOPMENT STATUS OF TECHNOLOGY

The technology has been validated in laboratory, and currently the research group is working on its development and scaling.

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INTELLECTUAL PROPERTY RIGHTS

The technology is protected through the following patents:

Spanish patent application P201131683, titled "Cámara de fondo de ojo multi-perspectiva." PCT extension number PCT/ES2012/070726.

COLLABORATION SOUGHT

- License agreement, manufacturing or marketing.
- R & D project to complete the development or apply to other sectors.
- Subcontracting agreement with another company.
- Possible spin-off (looking for partners)

RELATED IMAGES



Fig. 1. Eye

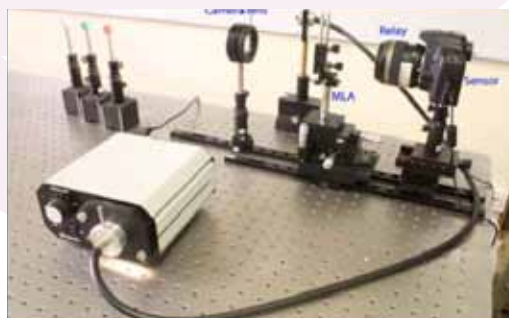


Fig. 2. Experimental setup to obtain 3D imaging

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