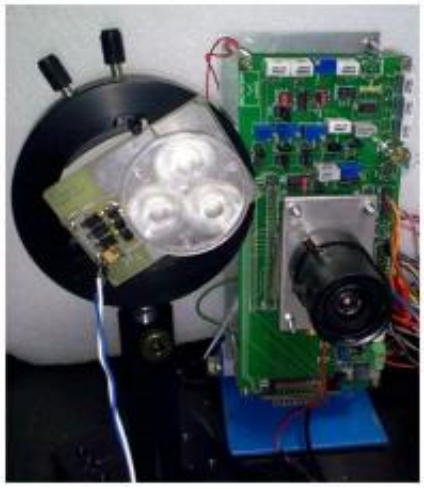
Here Comes the 3D Camera

May 13 2010



Preliminary prototype of the 3D vision system developed by SOI-FBK researchers

It's not a pun: we are truly entering a new dimension of technology with the 3D digital camera developed by the researchers of Fondazione Bruno Kessler (FBK) in Trento, Italy.

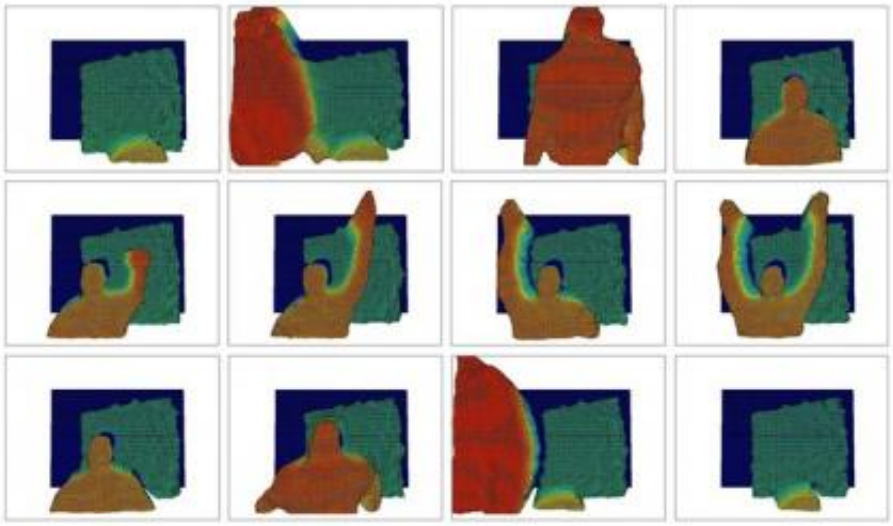
Virtual reality, security and surveillance, monitoring of the homes of the elderly, videogames. These are just some of the possible application of the patented prototype to be presented for the first time ever tomorrow in Eindhoven (The Netherlands), on the occasion of the scientific conference regarding the European project Netcarity.

Designed by David Stoppa and his colleagues at the SOI (integrated

optical sensors) Research Unit of Fondazione Bruno Kessler, the new technology also embodies a new record for Italian research: the physical dimensions of the reading cell that captures the light on the camera's sensor has the smallest pixel currently in existence in this field (10 μm, i.e. ten millionths of a metre, approx. one tenth the size of a human hair) which provides the prototype with the capacity to capture images with the largest quantity of details possible.

The SOI Unit researchers, headed by Lorenzo Gonzo of FBK, have developed the prototype with the financial support of the European Union within the context of the Netcarity project, dedicated to improving home living via new technologies.

Compared to the digital cameras currently available on the market that provide only a 2D projection of the scene to be shot, FBK's new camera also recovers the third dimension. The device illuminates the scene with ultra-short laser light pulses (in the order of a few billionths of a second) that "hit" the subjects being shot and then return to the starting point where they are detected by a sophisticated micro-sensor known as "CMOS" (Complementary Metal Oxide Semiconductor), capable of computing the distance of the various subjects, i.e. the third dimension. With this camera it is therefore possible to approach the stereoscopic vision of humans who have a three-dimensional perception of the subjects in their field of vision.



Examples of 3D images acquired using the new 3D camera

The FBK researchers are among the first to have created a sensor of this kind using standard CMOS technology, the same used for making microprocessors and most electronic components and that, among other things, allows savings in production costs.

The sensor can be applied to the assistance to and for the security of the elderly and the disabled. Indeed, the perception of the 3D scene allows extreme reliability in detecting any danger situations, such as accidental falls, and therefore can help reduce the risks for people living alone or without assistance. Next generation videogames could also benefit from a large step forward in their evolution, since the 3D vision system can directly “read” the player’s movements. This means the player can freely move about in the camera’s field of vision, simulating a sports challenge or a game without the need to hold or wear a device that transmits the player’s movements to the computer. Last but not least, the new camera could be applied to intelligent navigation and interaction systems to be used as sophisticated electronic guides inside museums, for example.

More information: www.fbk.eu

Provided by Fondazione Bruno Kessler

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