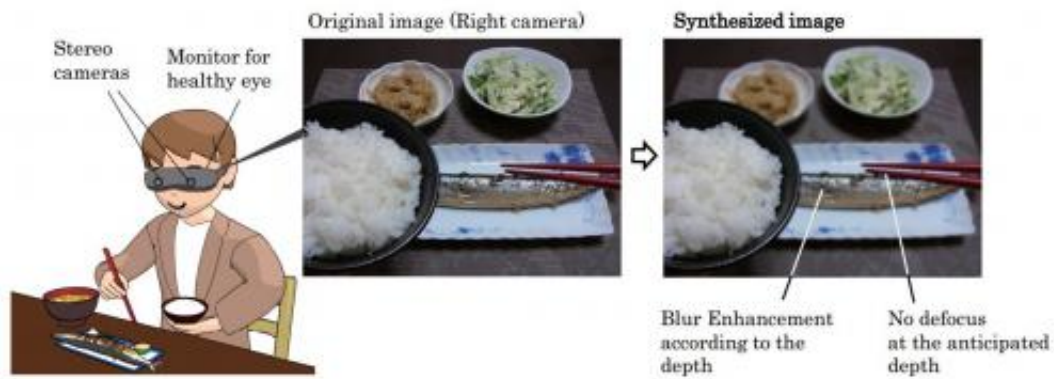# AR glasses are proposed to restore depth perception

January 27 2013, by Nancy Owano

System overview of mono-glass with an example application to dining assistance. Credit: Masahiro Toyoura et al.

(Phys.org)—People with impaired depth perception might see better with augmented reality glasses according to a research initiative under way at the University of Yamanashi in Japan. The team involved are working with off the shelf goggles that are aimed at the "bionocularly challenged," referring to people who lack binocular depth perception. The glasses generate a feeling of depth in the partially sighted person's "good" eye via software especially written for the glasses.

Xiaoyang Mao, group leader, and his team, have been working with commercially available 3-D glasses, the Wrap 920AR, manufactured by Vuzix, headquartered in Rochester, New York. Vuzix is identified as a

leading supplier of video eyewear products in the consumer, commercial and entertainment markets.

Wrap 920AR are glasses with small cameras poking out of each lens. The lenses are transparent and the device captures and projects images. The researchers turned to the Wrap 920AR glasses to make use of their design which incorporates the twin cameras, so that they could impart a feeling of depth to affected wearers with relevant [vision problems](link). Their system blurs objects according to their depth.

The images are funneled into software on a computer and the merged images are then displayed to the healthy eye. The visual data is processed by a quad-core Windows 7 machine.

The researchers say their research efforts will continue. They want to work on the processed imagery's resolution. "Finer resolution with larger window size could give us more accurate result," they said. Also, the glasses must be connected to a laptop, and that limits its practical use. "Since the system requires a [laptop computer](link) at least, currently it is not easy to wear the system," they said. They noted that "GPU computing will be realized in mobile environments in the near future."

The paper that describes their work is "Mono-[glass](link) for Providing Distance Information for People Losing Sight in One Eye."

They said that they are proposing a wearable device with two cameras and one display. The two cameras, they said, go to work in capturing images. "Depth information is then reconstructed from the captured images and visualized with defocusing for the healthy eye. Experimental results supported that our system could represent depth information in single-channel images."

Their paper also presented details of the materials used: "Our system was

implemented with Visual Studio 2010, CUDA4.2 and OpenCV2.4.1, and executed on a desktop PC (OS: Windows7 64bit, CPU: Intel Core2Quad 2.83GHz, GPU: NVidia GeForce GTX 460 1GB, MM:2GB)."

More information: Research paper: www.vc.media.yamanashi.ac.jp/d … Stereo_VRCAI2012.pdf

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