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QD Laser, Inc.

Institute for Nano Quantum Information Electronics, the University of Tokyo

Wearable See-Through Display "Laser Eyewear" Developed Based on Original Laser Retina Imaging Optics – Milestone for Daily-Use Smart Glasses with a Natural Fit –

Kanagawa and Tokyo Japan, June 5, 2014 ---
QD Laser, Inc., and the Institute for Nano Quantum Information Electronics, the University of Tokyo, today announced the successful technological development of wearable see-through display "Laser Eyewear" (LEW) based on laser retina imaging optics. This marks significant milestone for daily-use smart glasses with a natural fit.

The proof of concept model is exhibited to the public at 2014 Open House of the Institute of Industrial Science, the University of Tokyo, on June 6th and 7th. The URL is http://www.iis.u-tokyo.ac.jp/education_e/public_e.html

A variety of wearable smart devices like head mount displays and smart glasses are now being developed throughout the world. Almost all these devices adopt easy-to-attach liquid crystal displays (LCDs), with some commercialized.

The laser retina imaging, proposed early in the 90's, shows high brightness, high color reproducibility, and wide viewing angle to give any pictures at any position.[1)] So-called focus-free is also realized, i.e., picture clarity is independent of the individual visual power, whether short-sighted or far-sighted.[2)] In spite of these great advantages, laser retina imaging displays have yet to be commercialized, primarily due to its design difficulty.

The Laser Eyewear is based on the original laser imaging optical system, where red/blueRGB, i.e., red, blue, and green, semiconductor laser light is reflected and scanned on the MEMS mirror to project an image through the pupil onto the human retina. Achieved is the complete see-through characteristics, indispensable for augmented reality. The principle of the laser retina imaging optics enables smaller size,[3)] lower power consumption, and lower cost than any other existing devices based on LCDs. This opens a way to consumer devices, i.e., daily-use smart glasses with a natural fit.

The laser power in this system belongs to Class 1 with safety under all conditions of normal use, based on the safety standard of JIS/IEC. QDL is working on establishing the industrial standard of safety with interlock system of the eyewear set.

QDL is to continue further development of the LEW in terms of size and consumption power, and plans to release wired LEW as a support tool in working place by the end of 2015, and also, to release consumer-oriented wireless LEW by the end of 2017 as daily-use information devices.

Wearable see-through display “Laser Eye Wear”

Glossary and Notes

1) The laser scanning system has a very wide horizontal viewing angle of 60° or more, making it possible to provide an image at any position and with any size.

2) The image is projected onto the retina after converging the light beam in the entrance pupil of the observer. This so-called Maxwell view optics enables focus-free viewing.

3) The proof of concept model, 162 mm in width, is one of the smallest in the area of head mount displays and smart glasses. QDL is to provide the eyewear comparable to daily-use glasses in size, weight, and excellence in fit feeling by miniaturizing individual functional elements as lasers, MEMS, and optics.

About QD Laser, Inc.

Founded in April 2006 with capital funded by Fujitsu Limited & Mitsui Ventures (Currently "Mitsui & Co. Global Investment Ltd."), with headquarters located in Kanagawa, Japan. QD Laser, Inc. is a technology leader in the field of semiconductor lasers with wavelengths from 532, 1000 to 1310nm including quantum dot lasers, based on more than ten years of research collaboration between Fujitsu Laboratories Ltd. and the University of Tokyo in Japan.
For more information: www.qdlaser.com

About Institute for Nano Quantum Information Electronics, the University of Tokyo

Established in October 2006 as a cross-department organization by the University of Tokyo. The purposes are realizing technical innovation in future advanced electronics based on nanoscience, nanotechnologies and information science as well as promoting young researchers who will take a leadership role in future. Working in close collaboration with several leading companies, domestic universities, and overseas universities, NanoQuine aims to become an international CEO in the field of nanoquantum information electronics.
For more information about NanoQuine: http://www.nanoquine.iis.u-tokyo.ac.jp/index-e.html

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