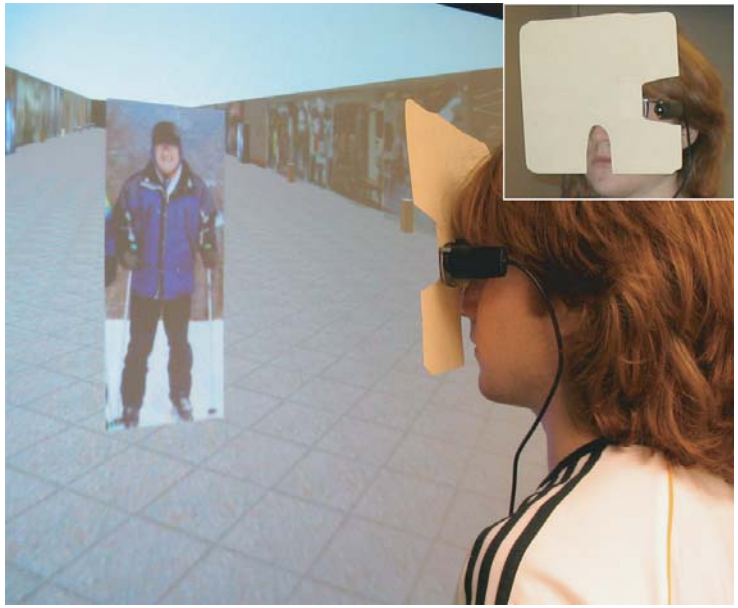
The Institute of OPTICS

Colloquium

University of Rochester

Vision Multiplexing as a Design Principle for Visual Aids



Professor Eli Peli
The Schepens Eye Research Institute
Dept. of Ophthalmology
Harvard Medical School

New England College of Optometry
Tufts University School of Medicine
York University, UK
Dalian Maritime University

This talk will present a novel concept of vision multiplexing that enables people with impaired vision to regain lost function.

3:00 pm, Monday, April 19, 2010
Sloan Auditorium, Goergen 101
Refreshments provided.

Jointly sponsored by:
Biomedical Engineering
Flaum Eye Institute
Center for Visual Science

Vision Multiplexing as a Design Principle for Visual Aids

Eli Peli
The Schepens Eye Research Institute, Dept. of Ophthalmology, Harvard Medical School, Boston, MA

Abstract

A novel concept of vision multiplexing combines the benefits of a wide field-of-view with high resolution to enable people with impaired vision regain the lost function without losing the surviving one. In optical and electro-optical devices we implemented spatial multiplexing by superposition or shifting, by temporal multiplexing (alternating) or by presenting different images to the two eyes, and with combinations of the various approaches.

Biography

Dr. Peli is the Moakley Scholar in Aging Eye Research and Co-Director of Research at Schepens Eye Research Institute, and Professor of Ophthalmology at Harvard Medical School. He also serves on the faculties of the New England College of Optometry (Adjunct Professor of Optometry and Visual Sciences), Tufts University School of Medicine (Adjunct Professor of Ophthalmology), University of York, UK (Honorary Visiting Professor in the Department of Electronics), and Dalian Maritime University, China (Visiting Professor). Since 1983 he has been caring for visually impaired patients as the director of the Vision Rehabilitation Service at the New England Medical Center Hospitals (now Tufts-Medical Center) in Boston. Dr. Peli is a Fellow of the American Academy of Optometry, a Fellow of the Optical Society of America, a Fellow of the SID (Society for Information Display), and a Fellow of the SPIE (The International Society of Optical Engineering). He was presented the 2001 Glenn A. Fry Lecture Award and the 2009 William Feinbloom Award by the American Academy of Optometry, the 2004 Alfred W. Bressler Prize in Vision Science (shared with Dr. R. Massof) by the Jewish Guild for the Blind, the 2006 Pisart Vision Award by the Lighthouse International, the 2009 Alcon Research Institute award (shared with Dr. R. Massof), and the 2010 Otto Schade Prize by the Society for Information Display. He was awarded an Honorary Degree of Master in Medicine by Harvard Medical School in 2002 and an Honorary Doctor of Science Degree from the State University of New York (SUNY) in 2006. Dr. Peli's principal research interests are image processing in relation to visual function and clinical psychophysics in low vision rehabilitation, image understanding and evaluation of display-vision interaction. He also maintains an interest in oculomotor control and binocular vision. Dr. Peli is a consultant to many companies in the ophthalmic instrumentation area and to manufacturers of head mounted displays (HMD). He served as a consultant on many national committees, including the National Institutes of Health, NASA AOS, Aviation Operations Systems advisory committee, US Air Force, Department of Veterans Affairs, US Navy Postdoctoral Fellowships Program, US Army Research Labs, and US Department of Transportation, Federal Motor Carrier Safety Administration. Dr. Peli has published more than 140 scientific papers and has been awarded 8 US Patents. He also edited a book entitled Visual Models for Target Detection with special emphasis on military applications and coauthored a book entitled Driving with Confidence: A Practical Guide to Driving with Low Vision (coauthored with Doron Peli).