

Technique enhances digital television viewing for visually-impaired

January 15 2008

Scientists at Schepens Eye Research Institute have found that people with low vision can improve their ability to see and enjoy television with a new technique that allows them to enhance the contrast of images of people and objects of interest on their digital televisions.

A study in the edition of the *Journal of the Optical Society of America* published online in November 2007 and issued in print in January 2008, demonstrates that patients with macular degeneration prefer watching TV with this contrast enhancement and that the level of enhancement they choose depends on how much vision they have lost with their disease.

Nearly four million Americans suffer from vision loss from diseases--such as macular degeneration--that impede their central vision and their ability to comfortably view the images on any television, cutting them off from a significant source of information and entertainment enjoyed by the mainstream.

Often such patients cannot see faces of characters or other details that make a broadcast understandable. Some solutions have been special telescopic glasses, which can help patients see details but often cut off parts of the image, lessening context, and large television screens, which can be quite costly.

The new method--developed by Dr. Eli Peli, the Institute's low vision expert, the Moakley Scholar in Aging Eye Research, and a professor of

ophthalmology at Harvard Medical School, is the latest of several image-enhancing innovations his research team has created to improve TV watching for the visually impaired. It is also the first developed for digital television images. “We knew it was time to address the changing technology,” says Peli, who pointed out that digital television will replace traditional television technology over the next few years due to government mandate.

Working within the “decoder” that makes digital television images possible, Peli and his colleagues were able to make a simple change that could give every digital TV the contrast enhancing potential for the benefit of the visually impaired. “The same modification could easily be made to new HDTVs, and digital cable set top boxes,” says Matthew Fullerton, the paper’s first author, and a student of electronic engineering from the University of York in England who is currently working on his Master’s degree in Peli’s lab.

To test their new technology, the team presented eight digital videos to 24 subjects with vision impairment and six with normal vision. Each patient was given a remote control, which allowed him/her to increase or decrease the contrast of the image. Patients manipulated over-enhanced and blurry images for the greatest clarity.

The research team learned that even subjects with normal sight selected some enhancement and that the amount of enhancement selected by those with visual problems varied depending upon the level of contrast sensitivity loss they experienced due to their disease. All this demonstrated to the team that the device was both usable and useful to the subjects, even those without vision problems.

Peli is now working with Analog Devices Inc. to create a prototype chip that could be included in all future generations of digital television. “The technology we created is quite simple and can easily and cheaply be

incorporated into even the newest technologies for television and internet video.”

Peli adds that he believes that as the population ages, this technology will be used by more and more of those whose eyes are going through a normal change as they get older as well as those more severely impaired.

Source: Schepens Eye Research Institute

Citation: Technique enhances digital television viewing for visually-impaired (2008, January 15) retrieved 18 April 2024 from

<https://phys.org/news/2008-01-technique-digital-television-viewing-visually-impaired.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--