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IEA Visual Ergonomics Newsletter—March 2014

Mission Accomplished!

For the past 2 years a major work item for the IEA VE TC has been the publication of a special visual ergonomics edition of *WORK: A journal of prevention, assessment and rehabilitation.* It therefore gives me great pleasure to report that the edition was published this month. Congratulations to all the contributors. A list of the table of contents is given on page 3 of this newsletter.

We are now set to commence work on our next major work item: the IEA Triennial Congress which will be held in Melbourne, Australia, in 2015. The call for papers will be announced soon, but now is the time to put your thinking caps on for a paper which you could present to your peers next year. The conference theme is "Reaching out".

As usual, this newsletter is brimming with news. If you have any items you wish to share for the next newsletter, please feel free to contact me. The deadline is 30 July 2014.

Jennifer Long
IEA Visual Ergonomics
TC Chairperson

Honours and awards

On February 14th 2014 **Hillevi Hemphälä** successfully defended her thesis at Lund university in Sweden, Faculty of Science: "*How visual ergonomics interventions influence health and performance - with an emphasis on non-computer work tasks*". Hillevi is an optometrist specialising in visual ergonomics and works at Lund university, Department of Design Sciences. Her thesis is the first in Sweden within the field of visual ergonomics and can be downloaded from http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=4250125&fileOId=4250134

Roger Hall was honoured by the Human Factors and Ergonomics Society of Australia (HFESA) in December 2013 with the Tom Triggs Award. This was awarded in recognition of Roger's lifetime contribution to visual ergonomics, in particular for his work on road lighting and pedestrian safety during the 1970s and 1980s. Now retired, Roger is also well known in Australia for his work on usability of new technology and as an educator in the ergonomics program at the University of New South Wales in Sydney.

Snippets

Problems seeing text on smartphones. A recent market survey in Norway of 1278 people aged 15 years and over was conducted by a professional market survey company, TNS Gallup, on behalf of The Norwegian Association of Optometry. 94% of those surveyed had a smartphone and 18% admitted that they *normally* had problems reading text or seeing pictures on their smartphone, even when using glasses. Of those aged 45 to 59, 26% said that they experienced difficulty seeing detail clearly on their phone.

Glow in the dark trees to replace street lighting? Here is a novel concept with lots of visual ergonomics implications: http://www.outdoordesign.com.au/news-info/Glowing-trees/1911.html

Stricter laws in Sweden for the use of laser devices. Heavy fines or up to two years in prison can now be imposed on people who own a laser class 3R, 3B or 4 without holding a permit from the Swedish Radiation Safety Agency.

Research request: Lighting and headaches

Olivier Penacchio and Arnold Wilkins have developed image processing software that will predict discomfort from images, accounting for an average of 25% of the variance in ratings from the structure of the image. They are seeking photographs of lighting installations where there have been complaints of headache from the lighting and photographs of installations where there have been no complaints. They need at least two photographs of each installation: (1) A photograph of the array of luminaires on the ceiling accompanied by (2) a photograph of the interior from occupants point of view. They will analyse the photographs and see whether they can explain the complaints in terms of the characteristics of the photographs.

They would be most grateful if the photographs could be sent by email to arnold@essex.ac.uk

Upcoming Events

Nordic Ergonomics Society Annual Conference, Copenhagen 17-20 August 2014 (will include parallel sessions on visual ergonomics)

International Ergonomics Association World Congress, Melbourne Australia 9-14 August 2015. Call for papers will be announced soon. www.iea2015.org

Conference reports

Intelligent Transportation Systems, Tokyo

The 20th World Congress on Intelligent Transportation Systems was held in Tokyo on 14-18 October 2013(http://www.itsworldcongress.jp/). Important technological improvements in traffic safety and transportation efficiency were presented and discussed. This included driver assistance systems (DAS) which aim to overcome the risk of accidents due to low visibility of pedestrians and bicycle drivers. DAS acquire and analyze traffic data and alert drivers in critical situations. Some DAS information is presented on displays integrated in the dashboard, but increasingly DAS makes use of augmented reality by projecting artificial information into the driver's visual field, enabling drivers to fixate on the driving scene while picking up information presented by the DAS. There are visual ergonomic problems with this technology which are yet to be investigated in depth, e.g. artificial information may distract drivers and occlude or impair important visual information in the driving scene, or information overload could bind driver's resources which are required in critical situations. Marino Menozzi and his PhD student Ying-Yin (Rudy) Huang gave two presentations at the congress: one with the title "Criterion-shift in a complex visual environment as function of location of information in the visual field and as function of age" and another dedicated to vision of drivers approaching tunnels.

German Society of Occupational Science Annual Conference, Munich

350 scientists attended the annual spring conference of the German Society of Occupational Science (GfA, http://www.gesellschaft-fuer-arbeitswissenschaft.de) in Munich on 12-14 March 2014. Munich is the place of birth of the Federation of the European Ergonomic Associations FEES (*www.**ergonomics-fees**.eu*) and the GfA conference was also held in this city 10 years ago. To celebrate the anniversary, GfA hosted a session by FEES in parallel to the conference. Visual ergonomics topics included the use of light spectra to improve vigilance at work, risk of seizures caused by LED lighting, computer-based training in the ergonomics of IT (information technology), vision in traffic and vision screening. Marino Menozzi and his colleagues reported the results from studies using their recently developed high fidelity driving simulator, which has been used in various studies, e.g. distraction of drivers by dynamic advertisements, effects of visual complexity in elderly drivers, and lighting in highway tunnels. Menozzi et al also reported on the risk of sun glare in driving. According to their findings, in some circumstances discomfort glare may contribute to the risk of crashes in a similar way to disability glare, and so they recommend that discomfort glare should be given a similar importance to disability glare.

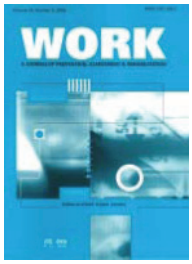
National Ergonomics Conference and Exhibition, Las Vegas

The National Ergonomics Conference and Exhibition (NECE) was held in Las Vegas in December 2013. It included a 90 minute visual ergonomics talk by Jeff Anshel which was attended by more than 200 people.

Visual Ergonomics getting some traction within the lighting industry

The Swedish lighting journal, *Ljuskultur*, has published four articles written by Per Nylén and Hillevi Hemphälä in four consecutive editions of the journal. The English translation of the titles are: "Visual Ergonomics is so much more than tired eyes", "How are we affected by flicker and invisible light modulations", "Requests about lighting quality by law—do they exist and, if so, are they reasonable?" and "Lighting at computer work, legal requests and recommendations."

A special visual ergonomics edition of the journal *WORK*



The March edition of *WORK: A Journal of prevention, assessment and rehabilitation* (volume 47, no 3) is dedicated to visual ergonomics.
http://iospress.metapress.com/content/t7112174156h/?genre=issue&issn=1051-9815&issue=current
This was a project of the IEA Visual Ergonomics Technical Committee and boasts the following articles, many of which are authored by members of our VE group:

What is Visual Ergonomics?	Jennifer Long (editorial)
Risk factors, incidence and persistence of symptoms from the eyes among professional computer users	A. Toomingas, M. Hagberg, M. Heiden, et al.
Reading from electronic devices versus hardcopy text	Jennifer E. Hue, Mark Rosenfield, Gianinna Saá
The visibility of controls and labels on electronic devices and their suitability for people with impaired vision	Hsuan Tan, Mei Ying Boon, Stephen J. Dain
Working spectacles for sorting mail	Hillevi Hemphälä, Camilla Dahlqvist, Catarina Nordander, et al.
Optimal correction in spectacles: Intervention effects on eye-strain and musculoskeletal discomfort among postal workers	H. Hemphälä, P. Nylén, J. Eklund
Understanding the visual skills and strategies of train drivers in the urban rail environment	Anjum Naweed, Ganesh Balakrishnan
Good expert knowledge, small scope	Horst Mayer
Forging partnerships between optometrists and ergonomists to improve visual comfort and productivity in the workplace	Jennifer Long
Setting visual pre-placement testing in a technology manufacturing environment	Nancy J Gowan
Enabling positive work outcomes for people with low vision: Two case studies	Luisa Ferronato, Amelia Ukovic
Evolutionary adaptations: Theoretical and practical implications for visual ergonomics	Knut Inge Fostervold, Reidulf G. Watten, Frode Volden
Vision, light and aging: A literature overview on older-age workers	P. Nylén, F. Favero, S. Glimne, et al.
Neck pain brought into focus	Hans O. Richter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Paying it Forward

Visual ergonomics at work and leisure

Jennifer Long [a,b,*] and Hans Richter [c]

In consultation with Magne Helland [d], Marino Menozzi [e] and Allan Toomingas [f]

One only has to look around to see how technology is being used by young and old. Movies in 3D. Smart phone technology. Interactive devices for purchasing train tickets or car parking vouchers. It seems that each day a new type of device is invented with the promise that it will make our lives easier or improve our access to knowledge.

Many of these devices rely on the sense of vision by the end user. However, if the display is difficult to see or uncomfortable to view, then the end user could:

- Experience physical discomfort, make mistakes or work more slowly. In the workplace this could have wide-reaching consequences, such as reduced productivity, increased risk of accidents and personal injury.
- Reject the device. This may be a disappointment for the purchaser and have commercial consequences for the developer who invests resources into a product which no-one wants to use or buy.

Using a digital device doesn't have to be a pain in the neck

Computers, smartphones, iPads and other computer devices are widespread in modern society, and are used at work and at leisure. It is easy to take them for granted and underestimate the demands they place on our visual system.

If we are unable to see the displays clearly, then we may adopt awkward postures. This can lead to physical discomfort, especially in our eyes, neck and shoulders. It can also affect our enjoyment using the device and our ability to concentrate.

Comfort and efficiency can be improved by ensuring that the devices are set-up correctly and that they are viewed from a comfortable distance and position. It is also important to have a regular eye examination, wear appropriate spectacle lenses and take frequent breaks when using the devices.

Some of the ways visual ergonomics can make a difference

Visual ergonomics is a science which aims to achieve a good balance between what a person can see and the visual demands of a task. This requires an understanding of the human visual system and an analysis of the visual demands of a task. Visual ergonomics professionals can assist by:

- Participating during the design phase of a task or an environment e.g. by providing information about what end users should be able to see so that products are comfortable, easy and safe to use.
- Providing advice post-design to improve comfort, safety or ease of use e.g. how to set up a computer display, appropriate use and placement of lighting.
- Working with individuals who have specific visual needs e.g. suggesting the use of magnification aids or other assistive technology.

The edition also includes an article "Visual Ergonomics at work and leisure" which was developed as an IEA Visual Ergonomics TC project. This type of article is a new initiative within WORK and the purpose is to translate research into practice.
If you need to explain what visual ergonomics is in a practical way to colleagues or clients, then you are free to distribute hardcopy or electronic copies of this article. To download a copy, visit
http://iospress.metapress.com/content/x73425m166031281/?p=378e3518f74f4edc9ccacc21c02b8967&pi=14

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