

Once every 3 years the international ergonomics / human factors community meets for the IEA Triennial congress. At this congress 26 Technical Committees (TC) coordinate their respective scientific streams, of which visual ergonomics (VE) is one stream. The 19th congress was held in August 2015 in Melbourne, Australia.

The congress is also an opportunity for our TC to meet face-to-face. We held a general meeting at the congress, during which we had a change in our

executive team members.

I would like to thank Hans Richter who completed a 6 year term as co-chair of the VE TC and who remains on the executive committee. In his place I welcome Marino Menozzi as the new co-chair. I would also like to welcome Hillevi Hemphälä as a new executive team member. I remain as chair for another 3 years, and Magne Helland also remains on the executive.

This newsletter is brimming with news, including a report of

some of the IEA VE TC activities at IEA2015.

I hope you have a safe and enjoyable holiday season and a happy new year.

Jennifer Long

IEA Visual Ergonomics TC  
Chairperson



Jennifer Long, Magne Helland  
and Hillevi Hemphälä at IEA2015

## Congratulations

### Susanne Glimne

In October, Susanne Glimne successfully defended her PhD thesis "Effects of glare on binocular vision and reading behavior performing computer work". Her research was conducted at the Karolinska Institute, Stockholm, Sweden, and has resulted in publications in the journals *WORK* and *Strabismus*.



### Steven Orfield

In November, Orfield Laboratories won the "Dementia Design Innovation of the Year" award at the University of Stirling International Dementia Awards during the International Dementia Conference in Birmingham, England. This award recognises good design in a communal or private setting used by people with dementia. Orfield Laboratory received the award for their worldwide efforts to develop a perceptual and cognitive standard for people aged over 90 years which can be used in the design of environments for the aged.

**Sanjram Premjit Khanganba**, of the Human Factors & Applied Cognition Laboratory, Indian Institute of Technology Indore, was recognised by Elsevier and Science Direct for his publication "Attention and intended action in multitasking: An understanding of cognitive workload" (*Displays* 34(4): 283-291). This article was ranked within the top 25 most downloaded engineering articles during January-December 2014.



## Upcoming Events

**CIE 2016  
Lighting  
Quality and  
Energy  
Efficiency,  
Melbourne, 3-5  
March 2016,  
[http://  
melbourne2016.cie.  
co.at/home](http://melbourne2016.cie.co.at/home)**

**Nordic  
Ergonomics  
Society (NES)  
Annual  
Conference,  
Kuopio,  
Finland 14—17  
August 2016.**

## Conference Report NES2015—by Magne Helland

“Creating Sustainable Work Environments” was the theme for NES2015, the Nordic Ergonomics Society 47th Annual Conference. It was held in November at Lillehammer, Norway, the site of the 1994 Winter Olympic Games. Although there was not enough snow for winter activities at NES2015, it was a very good conference setting with more than 100 attendees, mainly from the Nordic countries, who are from a broad range of backgrounds and professions.

Visual ergonomics was well represented in the conference program, with 2 parallel sessions, 8 oral presentations and a visual ergonomics network meeting. Three of the talks were presented by people affiliated with Department of Optometry and Visual Science at Buskerud and Vestfold University College, Norway. Approximately 25 - 30 people attended the visual ergonomic activities.

In his keynote presentation “Sustainable work environments: What and Why?”, Knut Inge Fostervold from the University of Oslo (photo, right) explained in a visual manner the complexity of work environments. Fostervold was also the chair of the conference organizing committee, and he and his team did a great job. Next year NES2016 will be held in Finland.



## Conference Report IEA2015—by Jennifer Long

The International Ergonomics Association Congress is held every three years. This year it was jointly hosted in Melbourne Australia by the Human Factors & Ergonomics Society of Australia and the Human Factors & Ergonomics Society of New Zealand. Attended by more than 900 delegates during 9-14 August, it boasted 15 concurrent sessions each day, 152 poster presentations and 5 keynote speakers.

There were 2 visual ergonomics streams at IEA2015. Here is a photo of 5 of the presenters (L-R): Andre Calero Valdez (*Reducing complexity with simplicity—Usability methods for industry 4.0*), Cecile Paris (*We feel: Taking the emotional pulse of the world*), Jennifer Long (*Viewing distance and eyestrain symptoms with prolonged viewing of smartphones*), Knut Inge Fostervold (*Exploring the impact of incorporating lighting design in universal design processes by means of eye-movement recordings*) and Frank Po-Hung Lin (*Visual fatigue evaluation of glasses-free 3D handheld console*).



Hillevi Hemphala and Jennifer Long also conducted a Visual Ergonomics Lighting Workshop which attracted 35 participants.



Visual ergonomics topics were not confined to the VE stream, for example, VE featured in Ergonomics and Design for All, a session chaired by Italian architect Isabella Steffan. There were also presentations scattered throughout the program on the topics of wearable devices, 3D displays and lighting.

A copy of the conference proceedings is available at <http://ergonomics.uq.edu.au/iea/proceedings/Index.html>

## Publications

Wilkins, A. (2015). A physiological basis for visual discomfort: Application in lighting design. *Lighting research and technology*. October 19, 2015, doi: 10.1177/1477153515612526

Salve, UR (2015) Vision related problems among the workers engaged in jewellery manufacturing. *Indian Journal of Occupational and Environmental Medicine*. 19 (1): 30-35.

Cohen, HH, Sloan GD (2016). The science behind codes and standards for safe pedestrian walkways: Lighting and visual cues. *Applied Ergonomics* 52: 112-119

Papamichael K, Siminovitch M, Veitch J, Whitehead L (2016) High Color Rendering Can Enable Better Vision without Requiring More Power, *LEUKOS*, 12:1-2, 27-38.

## Say it again

In November, Californian optometrist, Jeffrey Anshel, gave a 1 hour presentation “Seeing is Believing: Digital Eyes” at the National Ergonomics Conference and Exposition in Las Vegas. This is the 13th year in a row that he has presented this topic at this conference.

## Two viewpoints: Challenges for visual ergonomics

### Focus on Vision and Stress—by Horst Mayer

Visual ergonomics deals with understanding and optimizing visual work. Within the process of seeing the eyes play only a partial role.

In this article I will discuss an important source of friction in our ergonomic efforts: stress. From the stress models available, the one which appears to be the best fit for our purposes is the demand-control model of RA Karasek<sup>1</sup>. Its orthogonal structure is composed of demands (quantitative or qualitative) and the scope of control /decision / skills. High stress results when high demands are coupled with low control. Another kind of stress can be seen when skilled employees are chronically confronted with low demands.

Some examples of where stress and strain are predominantly caused by imbalanced visual work are prolonged near work, small detail, weak contrast, insufficient visual acuity, poor binocular coordination, reduced capability of accommodation and adaptation, reduced ability of the ciliary muscle for relaxation, large luminance differences in the visual field, glare, repetitive, monotonous sensory partial works, unbalanced proportion of colors, and an inadequate field of vision.

Following from stress we see strained restlessness if no postural compromise is found, demotivation, insomnia, low precision of oculomotor activity, concentrative suppression of blinks (dry eye syndrome), transient myopia, central nervous and/or muscular fatigue, destabilization of the state of activation and altered health behavior (coping). In our own projects we have found that in the majority of asthenopic complaints the feedback loop between coping problems in visual work and stress had been building up, in many cases mediated by fatigue combined with muscular and fascial overtaxing or ligamentous spinal strains. We also found a deteriorating dark adaptation and a smaller fusional range, together with a diurnal fluctuation of refraction and accommodation range and velocity.

I see mainly three consequences: We will have to develop the dynamic features of visual ergonomics, must find ways to see and break the counterproductive loops, and last but not least, we must adopt a multidisciplinary approach to solve these issues. Above all: humans are not machines and eyes are not cameras.

<sup>1</sup> Karasek RA (1998): Demand/Control Model: a social, emotional, and physiological approach to stress risk and active behaviour development. In: *Stellman J (Ed.) Encyclopedia of Occupational Health and Safety*. International Labour Office (ILO), Genève, Suisse)



### Fast pace—by David Brown

20 years ago there was time for a good fight. It took manufacturers time and a lot of money to retool. Perhaps that gave the time and inclination to get products right in the first instance.

Today things are smaller, cheaper and come to market faster. Many products come and go before they are formally evaluated for work or for general use. They are built to Standards, but what if they are wrong?

What is our role in this fast paced world so that we can ensure new products are a good fit with humans?

Hmm...food for thought.

**NEXT NEWSLETTER DEADLINE:**  
**30th MARCH 2016**  
[jlong@visualergonomics.com.au](mailto:jlong@visualergonomics.com.au)