

COGAIN



IR Safety Standards for Eye Tracking Systems

Origins



- Board of User Groups
 - Concern regarding safety of IR light emissions
 - Requested that COGAIN investigate
- Response from COGAIN members
 - WP5 agreed to take the task
 - TU-Dresden agreed to lead it

Safety issues in Eyetracking



- WP5 – Eyetracker Development
 - WP Leader – Arantxa Villanueva (UPNA)
 - IR safety task (T5.9) Leader – Fiona Mulvey (TU-Dresden)
- WP2 – Standardisation
 - Lead by Fulvio Corno
 - Development of a safety standard also contributes to standardisation directive

First steps



- Review of literature; current standards and standardising bodies
 - Contact with Eyetracking companies
 - Requested information on the parameters of emitted light
 - Requested information on the standards used to assess safety
 - Comparison of permitted exposure levels in standards quoted
 - Wide variation in the MPEs according to different standards
 - Some standards (e.g. for lasers) are inappropriately stringent for LEDs
 - Wide variety of different standards used by different manufacturers
 - Special case of long term daily exposure



- Documents:
 - Near IR LED Health and Safety Memorandum COGAIN WP5 Retreat Prague, May 16th, 2007 (Velichkovsky, Mulvey, Heubner)
 - Interim progress report – COGAIN camp Leicester, 3-6th September, 2007 (Mulvey, Lange)

Contact with standardising bodies



- Commission Internationale de L'Eclairage (CIE)
 - Division 6; Photobiology and Photochemistry
 - Ann Webb – Director
- CIE Technical Committee
 - Chair David Sliney
 - Three other members from the CIE
 - Per Söderberg
 - Karl Schulmeister
 - Jean-Pierre Cessarini

- First meeting of the proposed Technical Committee, Brussels
22nd November 2007
 - Several systems measured
 - All systems measured were well within current safety standard limits
 - Identified key issues in development of safety standard for eyetracking devices
 - Adjustment of calculations / maximum exposure levels for long-term, every day viewing
 - Consideration of special issues such as medications, limited movement of the eye, lack of blinking.

- Documents:
 - Interim progress report December 2007 (Mulvey)
 - Terms of reference and membership of the technical committee proposed to the board of the CIE and now approved
 - Deliverable D5.4 published on COGAIN website (Mulvey, Villanueva, Sliney, Cotmore, Donegan)
 - First draft of CIE Technical Committee Report (TC committee)

CIE Technical Committee



- All work within the CIE is voluntary; there is no funding available except for the publication of the final report.
- A proposed committee and its task must be approved by the division within CIE and then by the Board of Administration
- Usually reviewed at annual meetings or by letter ballot

The structure of a Technical Committee



- Chair
- Terms of reference
- 5 members from different countries
- May involve industry members if such members can demonstrate research capabilities
- Usually includes a mixture of academics, public bodies, and industry
- Should be a maximum of ten members with different backgrounds

Joint CIE / COGAIN TC



- Dr. Jean-Pierre Cesarini (France) [Photodermatology]
- M. Jacques Charlier (France) [Electro-optics technology]
- Mr. Dixon Cleveland (USA) [Electro-optics technology]
- Prof. Gintautas Daunys (Lithuania) [Electronics, Physics]
- Mr. Detlev Droege (Germany) [Electro-optics technology]
- Dr. Michael Donnegan (UK) [Disability & Assistive Technology]
- Mr. Markus Joos (Germany) [Electro-optics systems technology]
- Ms. Fiona Mulvey - Secretary (Germany) [Cognitive science, vision science]
- Dr. David H. Sliney - Chair (USA) [Biophysics, optical radiation safety]
- Dr. Karl Schulmeister (Austria) [Biophysics, laser safety]
- Mr. Mårten Skogö (Sweden) [Electro-optical systems technology]
- Prof. Per Söderberg (Sweden) [Ophthalmology]
- Prof. Olga Štěpánková (Czech Republic) [Electrical Engineering/Cybernetics]
- Dr. Arantxa Villanueva (Spain) [Electrical/Electronic Engineering]

Our motivation



- Why are we doing this?
 - Lack of clarity as regards safe exposure levels
 - Eyetracking is becoming more mainstream and the industry is expanding to new user situations
 - Users need a clear and understandable guarantee of the safety of their systems
 - We have an opportunity to bring together the expertise of COGAIN and the CIE for the benefit of the industry generally

Progress to date



- We have now measured 10 representative systems
- We are establishing standard measurement techniques
- We are researching issues related to special populations; medications, abnormalities in eye movement behaviours
- We have prepared a draft report

Progress to date



- We have identified what measures or other work will need to be done and who will do it
- We can state that none of the representative systems measured approached current safety limits
- We can not say at this stage if our standard will need to be significantly different from current standards, but we consider it unrealistic that it will differ to a degree which would render any system unsafe – the levels of emission are low

What we will achieve



- Develop a standard within the CIE which is explicitly directed at eyetracking
- Communicate in understandable terms to the public on the issue of eye safety
- Develop a set of best practises in eyetracking for users who may have medical issues which make them particularly vulnerable to damaging effects
- Provide clear protocol and safety limits for manufacturers and designers of current and future eye tracking devices



Thanks for your attention!