Eye tracking research at CELSTEC, OU

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Free Hands-on Eye Tracking Workshop:
SMI Eye Tracking Glasses on Tour in the Netherlands
9th December 2011

Welcome at the Open University of the Netherlands!

• Public university with open admission and distance education
• Degree programmes (BA, MSc, PhD) in
  – Psychology, Law, Management, Cultural Studies, Informatics, Natural Sciences, Education
• Focus on life long learning
• In addition to this, the university has an expertise centre, which develops innovative teaching methods for distance education and higher education in general and is aimed to support the different schools of the OU...

Centre for Learning Sciences and Technologies - CELSTEC

• Four programs
  – Learning and Cognition
  – Learning Networks
  – Mobile Learning
  – Serious Gaming
• with three functions
  – Research
  – Open Laboratories
  – Solutions
• Our research focuses specifically on educational technology, i.e. the use of innovative methods and technologies at OU and other institutions of higher education.

Research methodologies and research labs

My relation to eye tracking ...

• Ph.D. on the characteristics and training of visual expertise investigated via eye tracking and verbal reports (2007-2010)
• Research stays in a large eye tracking lab in Sweden (Humanities Lab in Lund)
• Assistant professor at CELSTEC, OU with the task to expand eye tracking lab and the according research (since July 2010)
• Research on both applied (dynamic scenes, expertise differences, EMME, mental effort, web search, …) and basic eye tracking topics (scanpath similarity measure, eye-hand measure)
• Trainings on the eye tracking methodology (IPN Kiel, IURE, ICS, Stanford, …)
• Part of Orga team of the ECEM 2013

Eye tracking equipment at CELSTEC

Mobile eye tracker: SMI HED

Monitor-mounted eye tracker that can be used as a stand-alone version:
SMI RED 250

Monitor-integrated eye tracker:
Tobi 1750
EYE TRACKING RESEARCH @ CELSTEC

Eye tracking @ CELSTEC (previous research)
- Cued Retrospective Reporting
- Visual expertise
- Eye Movement Modeling Examples

Triangulating eye tracking data: Cued Retrospective Reporting
- Eye tracking data tells us where a person looked at and for how long, but not WHY
- methodological triangulation with verbal data
- Replaying recordings of participants’ own eye movements and asking them to tell what they were thinking while performing the task
- Van Gog et al., Journal of Experimental Psychology: Applied, 2005

Investigating perceptual aspects of expertise
- ... in controlling electrical circuit
- ... in classifying biological locomotion patterns
  Jarodzka, Schelter, Geijens, & Van Gog (2010). Learning and Instruction
- ... in diagnosing epileptic seizures in infants

Training of visual expertise: Eye Movement Modeling Examples

Eye tracking @ CELSTEC (ongoing studies)
- Visual expertise
  - ATC (Van Mieussen, Jarodzka, Brand-Gruwel, Krischner, de Bock, & Van Merrienboer)
  - MedEye / Eye of the master (Jarodzka, Jaarsma, & Boohuisen)
- Methodological aspects of ET
  - WebQuest (Argiagagos, Brand-Gruwel, Jarodzka, & Pifarre)
- Mental effort measures with ET
  - MousEyeME (Van Mierlo, Jarodzka, Krischner, & Kirschner)
- Testing design (Jarodzka, Janssen, Kirschner, & Erkens)
- Neuro-psychological ET studies
  - Gym2Learn / Eat2Learn (De Groot, Jarodzka, & Kirschner)
Processes mediating expertise in air traffic control

MedEye / Eye of the master: visual expertise in medicine

WebQuest: Methodological triangulation of LOG, EYE, and CRRR

MousEyeME: Eye-mouse error & delay as indicators for mental effort

Testing made easier: Avoiding split attention

Gym2Learn / Eat2Learn: Influence of physical activity and nutrition on learning
For more information on this talk:

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