John Paulin Hansen - DTU Orbit (07/02/2019)
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Organisations

Professor, Group Leader, Department of Management Engineering
26/06/2015 → present
jpha@dtu.dk
VIP

Transport DTU
16/03/2017 → present
VIP

Technology and Innovation Management
27/06/2015 → present
VIP

Copenhagen Center for Health Technology
21/11/2015 → present
VIP

Risø National Laboratory for Sustainable Energy
09/04/2008 → 07/04/2016 Former
VIP

Research outputs:

Pupillary measurement during an assembly task
We conducted an empirical study of 57 children using a printed Booklet and a digital Tablet instruction for LEGO® construction while they wore a head-mounted gaze tracker. Booklets caused a particularly strong pupil dilation when encountered as the first media. Subjective responses confirmed the booklet to be more difficult to use. The children who were least productive and asked for assistance more often had a significantly different pupil pattern than the rest. Our findings suggest that it is possible to collect pupil size data in unconstrained work scenarios, providing insight to task effort and difficulties.

General information
State: Published
Organisations: Department of Applied Mathematics and Computer Science, Cognitive Systems, Department of Management Engineering, Technology and Innovation Management, Malmö University
Contributors: Bækgaard, P., Jalaliniya, S., Hansen, J. P.
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Publication date: 1 Feb 2019
Peer-reviewed: Yes

Publication information
Journal: Applied Ergonomics
Volume: 75
ISSN (Print): 0003-6870
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 2.95 SJR 1.071 SNIP 2.094
Web of Science (2017): Impact factor 2.435
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.18 SJR 0.944 SNIP 1.775
Web of Science (2016): Impact factor 1.866
Gaze typing in virtual reality: Impact of keyboard design, selection method, and motion

Gaze tracking in virtual reality (VR) allows for hands-free text entry, but it has not yet been explored. We investigate how the keyboard design, selection method, and motion in the field of view may impact typing performance and user experience. We present two studies of people (n = 32) typing with gaze+dwell and gaze+click inputs in VR. In study 1, the typing keyboard was flat and within-view; in study 2, it was larger-than-view but curved. Both studies included a stationary and a dynamic motion conditions in the user's field of view. Our findings suggest that 1) gaze typing in VR is viable but
constrained, 2) the users perform best (10.15 WPM) when the entire keyboard is within-view; the larger-than-view keyboard (9.15 WPM) induces physical strain due to increased head movements, 3) motion in the field of view impacts the user’s performance: Users perform better while stationary than when in motion, and 4) gaze+click is better than dwell only (fixed at 550 ms) interaction.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Transport DTU, Copenhagen Center for Health Technology, Texas A and M University
Contributors: Rajanna, V., Hansen, J. P.
Publication date: 14 Jun 2018

Head and gaze control of a telepresence robot with an HMD
Gaze interaction with telerobots is a new opportunity for wheelchair users with severe motor disabilities. We present a video showing how head-mounted displays (HMD) with gaze tracking can be used to monitor a robot that carries a 360° video camera and a microphone. Our interface supports autonomous driving via way-points on a map, along with gaze-controlled steering and gaze typing. It is implemented with Unity, which communicates with the Robot Operating System (ROS).

General information
State: Published
Organisations: Technical University of Denmark, Department of Management Engineering, Technology and Innovation Management
Contributors: Hansen, J. P., Wang, Z., Alapetite, A., Minakata, K., Thomsen, M., Zhang, G.
Number of pages: 3
Publication date: 14 Jun 2018

A Fitts' law study of click and dwell interaction by gaze, head and mouse with a head-mounted display
Gaze and head tracking, or pointing, in head-mounted displays enables new input modalities for point-select tasks. We conducted a Fitts' law experiment with 41 subjects comparing head pointing and gaze pointing using a 300 ms dwell (\(n_1 = 22\)) or click (\(n_2 = 19\)) activation, with mouse input providing a baseline for both conditions. Gaze and head pointing were equally fast but slower than the mouse; dwell activation was faster than click activation. Throughput was highest for the mouse (2.75 bits/s), followed by head pointing (2.04 bits/s) and gaze pointing (1.85 bits/s).
activation, however, throughput for gaze and head pointing were almost identical, as was the effective target width (≈ 55 pixels; about 2°) for all three input methods. Subjective feedback rated the physical workload less for gaze pointing than head pointing.

**General information**

State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Department of Applied Mathematics and Computer Science, Cognitive Systems, Texas A and M University, York University Toronto
Pages: 1-5
Publication date: 2018

**Host publication information**

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Publisher: Association for Computing Machinery
Article number: Article No. 7
ISBN (Print): 978-1-4503-5790-6
Keywords: Fitts’ law, ISO 9241-9, Dwell activation, Gaze interaction, Head interaction, Head mounted displays
Electronic versions:

Hansen_2018_A_Fitts_law_study_of_click_and_dwell_interaction_by_gaze_head_and_mouse_with_a_head_mounted_display.pdf

DOIs:
10.1145/3206343.3206344

Source: FindIt
Source-ID: 2435403610
Research output: Research - peer-review » Article in proceedings – Annual report year: 2018

**A gaze interactive assembly instruction with pupillometric recording**

This paper presents a study of a gaze interactive digital assembly instruction that provides concurrent logging of pupil data in a realistic task setting. The instruction allows hands-free gaze dwells as a substitute for finger clicks, and supports image rotation as well as image zooming by head movements. A user study in two LEGO toy stores with 72 children showed it to be immediately usable by 64 of them. Data logging of view-times and pupil dilations was possible for 59 participants. On average, the children spent half of the time attending to the instruction (S.D. 10.9%). The recorded pupil size showed a decrease throughout the building process, except when the child had to back-step: a regression was found to be followed by a pupil dilation. The main contribution of this study is to demonstrate gaze-tracking technology capable of supporting both robust interaction and concurrent, non-intrusive recording of gaze- and pupil data in-the-wild. Previous research has found pupil dilation to be associated with changes in task effort. However, other factors like fatigue, head motion, or ambient light may also have an impact. The final section summarizes our approach to this complexity of real-task pupil data collection and makes suggestions for how future applications may utilize pupil information.

**General information**

State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Department of Applied Mathematics and Computer Science, Cognitive Systems, Lancaster University, IT University of Copenhagen
Contributors: Hansen, J., Mardanbegi, D., Biermann, F., Bækgaard, P.
Pages: 1723-1733
Publication date: 2018
Peer-reviewed: Yes

**Publication information**

Journal: Behavior Research Methods
Volume: 50
Issue number: 4
ISSN (Print): 1554-3528
Ratings:

Web of Science (2019): Indexed yes
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 3.74 SJR 2.099 SNIP 1.952
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 3.17 SJR 1.867 SNIP 1.726
Scopus rating (2015): CiteScore 3.05 SJR 2.363 SNIP 2.23
Scopus rating (2014): CiteScore 3.28 SJR 1.97 SNIP 1.811
Scopus rating (2013): CiteScore 2.87 SJR 1.792 SNIP 1.625
Bicycles and Wheelchairs for Locomotion Control of a Simulated Telerobot Supported by Gaze- and Head-Interaction

We present an interface for control of a telerobot that supports field-of-view panning, mode selections and keyboard typing by head- and gaze-interaction. The utility of the interface was tested by 19 able-bodied participants controlling a virtual telerobot from a wheelchair mounted on rollers which measure its wheel rotations, and by 14 able-bodied participants controlling the telerobot with an exercise bike. Both groups tried the interface twice: with head- and with gaze-interaction. Comparing wheelchair and bike locomotion control, the wheelchair simulator was faster and more manoeuvrable. Comparing gaze- and head-interaction, the two input methods were preferred by an equal number of participants. However, participants made more errors typing with gaze than with head. We conclude that virtual reality is a viable way of specifying and testing interfaces for telerobots and an effective probe for eliciting peoples subjective experiences.

Computer-Implemented Method of Recovering a Visual Event

A computer-implemented method and a computer of recovering a visual event, comprising: by means of a graphical user interface, the contents of a viewpoint is displayed to a user as the viewpoint is progressively moved across graphical portions of a visual media object; while the contents of the viewpoint is displayed, recording an eye movement signal that is indicative of the movements of a user's at least one eye, classifying temporal sections of the eye movement signal into at least a class of long slow-phase OKN eye movements occurring among short slow-phase eye movements; setting a synchronization marker at least for a first occurrence of a temporal section classified as a smooth pursuit eye movement; wherein the synchronization marker comprises a link to or impression information of the contents of the viewpoint at the point in time when the first occurrence of a smooth pursuit eye movement occurred; via the synchronization marker, recovering the impression information or the contents of the viewpoint that was displayed at the point in time when the first occurrence of the smooth pursuit occurred.
**Substantiating reading teachers with scanpaths**

We present a tool that allows reading teachers to record and replay students’ voice and gaze behavior during reading. The tool replays scanpaths to reading professionals without prior gaze data experience. On the basis of test experiences with 147 students, we share our initial observations on how teachers make use of the tool to create a dialog with their students.

**Dynamic Bluetooth beacons for people with disabilities**

This paper focuses on digital aids for sight impairment and motor disabilities. We propose an Internet of Things (IoT) platform for discovering nearby items, getting their status, and interacting with them by e.g., voice commands or gaze gestures. The technology is based on Bluetooth Low Energy, which is included in consumer electronics such as smartphones without requiring additional hardware. The paper presents a prototype platform illustrated by concepts of use.
Low Cost and Flexible UAV Deployment of Sensors
This paper presents a platform for airborne sensor applications using low-cost, open-source components carried by an easy-to-fly unmanned aircraft vehicle (UAV). The system, available in open-source, is designed for researchers, students and makers for a broad range of exploration and data-collection needs. The main contribution is the extensible architecture for modularized airborne sensor deployment and real-time data visualisation. Our open-source Android application provides data collection, flight path definition and map tools. Total cost of the system is below 800 dollars. The flexibility of the system is illustrated by mapping the location of Bluetooth beacons (iBeacons) on a ground field and by measuring water temperature in a lake.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, Copenhagen Center for Health Technology, Transport DTU, IT University of Copenhagen
Contributors: Sørensen, L. Y., Jacobsen, L. T., Hansen, J. P.
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Publication date: 2017
Peer-reviewed: Yes

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Journal: Sensors
Volume: 17
Issue number: 1
ISSN (Print): 1424-8220
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BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 3.23 SJR 0.584 SNIP 1.55
Web of Science (2017): Impact factor 2.475
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 2.78 SJR 0.623 SNIP 1.614
Web of Science (2016): Impact factor 2.677
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 2.21 SJR 0.647 SNIP 1.643
Web of Science (2015): Impact factor 2.033
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.4 SJR 0.707 SNIP 1.796
Web of Science (2014): Impact factor 2.245
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.72 SJR 0.636 SNIP 1.758
Web of Science (2013): Impact factor 2.048
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.53 SJR 0.671 SNIP 1.709
Web of Science (2012): Impact factor 1.953
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.44 SJR 0.641 SNIP 1.439
Systems and methods of eye tracking calibration

Methods and systems to facilitate eye tracking control calibration are provided. One or more objects are displayed on a display of a device, where the one or more objects are associated with a function unrelated to a calculation of one or more calibration parameters. The one or more calibration parameters relate to a calibration of a calculation of gaze information of a user of the device, where the gaze information indicates where the user is looking. While the one or more objects are displayed, eye movement information associated with the user is determined, which indicates eye movement of one or more eye features associated with at least one eye of the user. The eye movement information is associated with a first object location of the one or more objects. The one or more calibration parameters are calculated based on the first object location being associated with the eye movement information.

General information
State: Published
Organisations: Department of Management Engineering
Publication date: 2017

Publication information
Country: United States
IPC: A61B3/113; G06F1/16; G06F21/36
Patent number: US9693684
Date: 04/07/2017
Priority date: 14/02/2014
Priority number: US201414180974
Original language: English
Electronic versions:
US9693684.pdf
Mobile gaze input system for pervasive interaction

A mobile gaze-tracking system is provided. The user operates the system by looking at the gaze tracking unit and at pre-defined regions at the fringe of the tracking unit. The gaze tracking unit may be placed on a smartwatch, a wristband, or woven into a sleeve of a garment. The unit provides feedback to the user in response to the received command input. The unit provides feedback to the user on how to position the mobile unit in front of his eyes. The gaze tracking unit interacts with one or more controlled devices via wireless or wired communications. Example devices include a lock, a thermostat, a light or a TV. The connection between the gaze tracking unit may be temporary or longer-lasting. The gaze tracking unit may detect features of the eye that provide information about the identity of the user.

Wrist-worn pervasive gaze interaction

This paper addresses gaze interaction for smart home control, conducted from a wrist-worn unit. First we asked ten people to enact the gaze movements they would propose for e.g. opening a door or adjusting the room temperature. On basis of their suggestions we built and tested different versions of a prototype applying off-screen stroke input. Command prompts were given to twenty participants by text or arrow displays. The success rate achieved by the end of their first encounter with the system was 46% in average; it took them 1.28 seconds to connect with the system and 1.29 seconds to make a correct selection. Their subjective evaluations were positive with regard to the speed of the interaction. We conclude that gaze gesture input seems feasible for fast and brief remote control of smart home technology provided that robustness of tracking is improved.
A Gaze Interactive Textual Smartwatch Interface
Mobile gaze interaction is challenged by inherent motor noise. We examined the gaze tracking accuracy and precision of twelve subjects wearing a gaze tracker on their wrist while standing and walking. Results suggest that it will be possible to detect whether people are glancing the watch, but not where on the screen they are looking. To counter the motor noise we present a word-by-word textual UI that shows temporary command options to be executed by gaze-strokes. Twenty-seven participants conducted a simulated smartwatch task and were able to reliably perform commands that would adjust the speed of word presentation or make regressions. We discuss future design and usage options for a textual smartwatch gaze interface.

General information
State: Published
Organisations: Department of Management Engineering, Technology and Innovation Management, The EyeTribe, IT University of Copenhagen, University of Copenhagen
Pages: 839-847
Publication date: 2015

Host publication information
Publisher: Association for Computing Machinery
ISBN (Electronic): 978-1-4503-3575-1
DOIs: 10.1145/2800835.2804332
Source: PublicationPreSubmission
Source-ID: 120871469
Research output: Research - peer-review › Article in proceedings – Annual report year: 2016

A GazeWatch Prototype
We demonstrate potentials of adding a gaze tracking unit to a smartwatch, allowing hands-free interaction with the watch itself and control of the environment. Users give commands via gaze gestures, i.e. looking away and back to the GazeWatch. Rapid presentation of single words on the watch display provides a rich and effective textual interface. Finally, we exemplify how the GazeWatch can be used as a ubiquitous pointer on large displays.

General information
State: Published
Organisations: University of Copenhagen, The EyeTribe, IT University of Copenhagen
Pages: 615-621
Publication date: 2015

Host publication information
Title of host publication: MobileHCI '15. Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services Adjunct
Publisher: Association for Computing Machinery
ISBN (Electronic): 978-1-4503-3653-6
DOIs: 10.1145/2786567.2792899
Source: PublicationPreSubmission
Source-ID: 120871704
Research output: Research › Article in proceedings – Annual report year: 2016

Civile Droner i Danmark: Kort lægning og teknologivurdering

General information
State: Published
Organisations: IT University of Copenhagen
Number of pages: 101
Publication date: 2014

Publication information
Publisher: Teknologi Rådet
Original language: Danish
Method for facilitating eye tracking control calibration for user during personal identification number entry, involves calculating calibration parameters based on object location being associated with eye movement information.

The method involves displaying objects being associated with a function unrelated to calculation of calibration parameters on a display of a computing device. Eye movement information associated with a user is determined when the objects are displayed, where the eye movement information indicates eye movement of eye features associated with an eye of the user. The eye movement information is associated with an object location of the objects. The calibration parameters are calculated based on the object location being associated with the eye movement information.

Method for facilitating eye tracking control calibration for a user of a computing device during personal identification number entry. Uses include but are not limited to a personal computer, a smartphone, a personal digital assistant (PDA), a mobile phone or a cellular telephone, a web appliance, a computing tablet or a tablet PC, an electronic reader, a TV, a set-top box, a laptop, a desktop computer, a display device and a head-mounted display.

The method enables filtering out visible light using an infrared pass filter such that field of view and depth of view of lenses of cameras in a camera module can allow the user to move around to accommodate for head pose variance of the user and an eye tracking control software can analyze images taken by the camera module to provide screen coordinates, thus improving image quality, while allowing number of users to use an eye tracking system at a given time, and hence increasing accuracy of eye tracking control calibration in a quick and efficient manner.

The Use of Gaze to Control Drones

This paper presents an experimental investigation of gaze-based control modes for unmanned aerial vehicles (UAVs or “drones”). Ten participants performed a simple flying task. We gathered empirical measures, including task completion time, and examined the user experience for difficulty, reliability, and fun. Four control modes were tested, with each mode applying a combination of x-y gaze movement and manual (keyboard) input to control speed (pitch), altitude, rotation (yaw), and drafting (roll). Participants had similar task completion times for all four control modes, but one combination was considered significantly more reliable than the others. We discuss design and performance issues for the gaze-plus-manual split of controls when drones are operated using gaze in conjunction with tablets, near-eye displays (glasses), or monitors.
Eye Movements in Gaze Interaction

Gaze, as a sole input modality must support complex navigation and selection tasks. Gaze interaction combines specific eye movements and graphic display objects (GDOs). This paper suggests a unifying taxonomy of gaze interaction principles. The taxonomy deals with three types of eye movements: fixations, saccades and smooth pursuits and three types of GDOs: static, dynamic, or absent. This taxonomy is qualified through related research and is the first main contribution of this paper. The second part of the paper offers an experimental exploration of single stroke gaze gestures (SSGG). The main findings suggest (1) that different lengths of SSGG can be used for interaction, (2) that GDOs are not necessary for successful completion, and (3) that SSGG are comparable to dwell time selection.
Gaze Tracking Through Smartphones
Mobile gaze trackers embedded in smartphones or tablets provide a powerful personal link to game devices, head-mounted micro-displays, PC's, and TV's. This link may offer a main road to the mass market for gaze interaction, we suggest.

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Skovsgaard, H., Hansen, J. P., Møllenbach, E.
Number of pages: 4
Publication date: 2013

Host publication information
Title of host publication: Proceedings. CHI 2013 Workshop on "Gaze Interaction in the Post-WIMP World"
Electronic versions:
Gaze_Tracking_Through_Smartphones.pdf
Research output: Research - peer-review › Article in proceedings – Annual report year: 2013

Talkingbadge
General information
State: Published
Organisations: IT University of Copenhagen
Number of pages: 1
Pages: 8
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: interactions
Volume: 20
Issue number: 5
ISSN (Print): 1072-5520
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.5 SJR 0.199 SNIP 1.03
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.23 SJR 1.007 SNIP 0.971
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.19 SJR 0.417 SNIP 1.664
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.09 SJR 0.425 SNIP 1.722
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 0.97 SJR 0.378 SNIP 1.363
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.86 SJR 0.403 SNIP 1.517
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.57 SJR 0.269 SNIP 1.037
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.293 SNIP 1.003
BFI (2009): BFI-level 2
Collecting location-based voice messages on a TalkingBadge

This paper presents three experiments to explore the feasibility of location-based voice messaging. We first compared three methods for collecting synthetic speech messages located in a room, namely PIN code entry, barcode scanning and automatic detection with a Bluetooth antenna. In addition to being very reliable, Bluetooth detection was significantly faster than PIN code entry and barcode scanning. We then examined detection times and errors in an open five floor building with antennas located densely. This confirmed that Bluetooth is fast enough to catch people walking through a zone and specific enough to distinguish between zones located just 20 meters apart. Finally, we played digitized voice messages to 11 participants walking into a zone. They received most of the messages well, but a majority of their comments were negative, expressing concerns for the potential infringement of privacy. We conclude that location specific audio messaging works from a technical perspective, but requires careful consideration of social comfort.

Conclusion and Look to the Future

Demo of Gaze Controlled Flying

Development of a control paradigm for unmanned aerial vehicles (UAV) is a new challenge to HCI. The demo explores how to use gaze as input for locomotion in 3D. A low-cost drone will be controlled by tracking user’s point of regard (gaze) on a live video stream from the UAV.
**Gaze input for mobile devices by dwell and gestures**

**General information**

State: Published  
Organisations: IT University of Copenhagen  
Contributors: Dybdal, M., San Agustin, J., Hansen, J. P.  
Pages: 225-228  
Publication date: 2012

**Host publication information**

Title of host publication: Proceedings of the Symposium on Eye Tracking Research and Applications. ETRA 12  
Publisher: Association for Computing Machinery  
ISBN (Print): 978-1-4503-1221-9  
DOIs:  
10.1145/2168556.2168601  
Research output: Research - peer-review › Article in proceedings – Annual report year: 2012

**Methods and Measures: An Introduction**

**General information**

State: Published  
Organisations: IT University of Copenhagen, Tokyo Institute of Technology  
Contributors: Hansen, J. P., Acki, H.  
Pages: 197-204  
Publication date: 2012

**Host publication information**

Title of host publication: Gaze Interaction and Applications of Eye Tracking: : Advances in Assistive Technologies  
Publisher: Idea Group Publishing  
ISBN (Print): 978-1-61350-098-9  
Research output: Research - peer-review › Book chapter – Annual report year: 2012

**TalkingBadge demo**

**General information**

State: Published  
Organisations: IT University of Copenhagen  
Contributors: Hansen, J. P., Wusheng, W., Shklovski, I.  
Pages: 771-772  
Publication date: 2012

**Host publication information**
Evaluating gaze-based interface tools to facilitate point-and-select tasks with small targets

Gaze interaction affords hands-free control of computers. Pointing to and selecting small targets using gaze alone is difficult because of the limited accuracy of gaze pointing. This is the first experimental comparison of gaze-based interface tools for small-target (e.g. <12 × 12 pixels) point-and-select tasks. We conducted two experiments comparing the performance of dwell, magnification and zoom methods in point-and-select tasks with small targets in single- and multiple-target layouts. Both magnification and zoom showed higher hit rates than dwell. Hit rates were higher when using magnification than when using zoom, but total pointing times were shorter using zoom. Furthermore, participants perceived magnification as more fatiguing than zoom. The higher accuracy of magnification makes it preferable when interacting with small targets. Our findings may guide the development of interface tools to facilitate access to mainstream interfaces for people with motor disabilities and other users in need of hands-free interaction.

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Skovsgaard, H., Mateo, J., Hansen, J. P.
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Publication date: 2011
Peer-reviewed: Yes

Publication information
Journal: Behaviour and Information Technology
Volume: 30
Issue number: 6
ISSN (Print): 0144-929X
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 1.85 SJR 0.676 SNIP 1.015
Web of Science (2017): Impact factor 1.38
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 1.85 SJR 0.745 SNIP 1.091
Web of Science (2016): Impact factor 1.388
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 1.61 SJR 0.637 SNIP 1.055
Web of Science (2015): Impact factor 1.211
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 1.39 SJR 0.587 SNIP 1.119
Web of Science (2014): Impact factor 0.891
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 1.54 SJR 0.705 SNIP 1.399
Web of Science (2013): Impact factor 0.839
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 1.37 SJR 0.53 SNIP 1.139
Web of Science (2012): Impact factor 0.856
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
**Evaluation of a remote webcam-based eye tracker**

In this paper we assess the performance of an open-source gaze tracker in a remote (i.e. table-mounted) setup, and compare it with two other commercial eye trackers. An experiment with 5 subjects showed the open-source eye tracker to have a significantly higher level of accuracy than one of the commercial systems, Mirametrix S1, but also a higher error rate than the other commercial system, a Tobii T60. We conclude that the web-camera solution may be viable for people who need a substitute for the mouse input but cannot afford a commercial system.

**General information**

State: Published
Organisations: IT University of Copenhagen
Contributors: Skovsgaard, H., San Agustin, J., Johansen, S., Hansen, J. P., Tall, M.
Publication date: 2011

**Host publication information**

Title of host publication: NGCA 11. Proceedings of the 1st Conference on Novel Gaze-Controlled Applications
Publisher: Association for Computing Machinery
Article number: 7
ISBN (Print): 978-1-4503-0680-5
DOIs: 978-1-4503-0680-5
Research output: Research - peer-review › Article in proceedings – Annual report year: 2011

**Gaze interaction from bed**

This paper presents a low-cost gaze tracking solution for bedbound people composed of free-ware tracking software and commodity hardware. Gaze interaction is done on a large wall-projected image, visible to all people present in the room. The hardware equipment leaves physical space free to assist the person. Accuracy and precision of the tracking system was tested in an experiment with 12 subjects. We obtained a tracking quality that is sufficiently good to control applications designed for gaze interaction. The best tracking condition were achieved when people were sitting up compared to lying down. Also, gaze tracking in the bottom part of the image was found to be more precise than in the top part.

**General information**

State: Published
Low Cost vs. High-End Eye Tracking for Usability Testing

Accuracy of an open source remote eye tracking system and a state-of-the-art commercial eye tracker was measured 4 times during a usability test. Results from 9 participants showed both devices to be fairly stable over time, but the commercial tracker was more accurate with a mean error of 31 pixels against 59 pixels using the low cost system. This suggests that low cost eye tracking can become a viable alternative, when usability studies need not to distinguish between, for instance, particular words or menu items that participants are looking at, but only between larger areas-of-interest they pay attention to.

Evaluation of a low-cost open-source gaze tracker

This paper presents a low-cost gaze tracking system that is based on a webcam mounted close to the user's eye. The performance of the gaze tracker was evaluated in an eye-typing task using two different typing applications. Participants could type between 3.56 and 6.78 words per minute, depending on the typing system used. A pilot study to assess the usability of the system was also carried out in the home of a user with severe motor impairments. The user successfully typed on a wall-projected interface using his eye movements.

Gaze-based interaction with public displays using off-the-shelf components

Eye gaze can be used to interact with high-density information presented on large displays. We have built a system employing off-the-shelf hardware components and open-source gaze tracking software that enables users to interact with an interface displayed on a 55” screen using their eye movements. The system works at a viewing distance of 1 to 1.5 meters and requires a 30 second calibration procedure for every user. We demonstrate how it can be used to navigate a
digital bulletin board display with several notes on top of each other. There are some technical challenges detecting the eyes when people are wearing glasses and when external light sources are present.

**General information**
State: Published
Organisations: IT University of Copenhagen
Contributors: San Agustin, J., Hansen, J. P., Tall, M. H.
Number of pages: 2
Publication date: 2010
Peer-reviewed: No
Event: Paper presented at Ubicomp 2010 DC, Copenhagen, Denmark.
Research output: Research › Paper – Annual report year: 2010

**Interaction with mainstream interfaces using gaze alone**

**General information**
State: Published
Organisations: IT University of Copenhagen
Contributors: Jensen, H. T. S. H., Mateo, J., Hansen, J. P.
Publication date: 2010
Peer-reviewed: No
Research output: Research › Paper – Annual report year: 2010

**Single gaze gestures**
This paper examines gaze gestures and their applicability as a generic selection method for gaze-only controlled interfaces. The method explored here is the Single Gaze Gesture (SGG), i.e. gestures consisting of a single point-to-point eye movement. Horizontal and vertical, long and short SGGs were evaluated on two eye tracking devices (Tobii/QuickGlance (QG)). The main findings show that there is a significant difference in selection times between long and short SGGs, between vertical and horizontal selections, as well as between the different tracking systems.

**General information**
State: Published
Organisations: IT University of Copenhagen
Contributors: Møllenbach, E., Lilholm, M., Gail, A., Hansen, J. P.
Pages: 177-180
Publication date: 2010

**Host publication information**
Title of host publication: ETRA ’10: Proceedings of the 2010 Symposium on Eye-Tracking Research and Applications
Publisher: Association for Computing Machinery
ISBN (Electronic): 978-1-60558-994-7
DOIs:
10.1145/1743666.1743710
Research output: Research - peer-review › Article in proceedings – Annual report year: 2010

**Small-target selection with gaze alone**

**General information**
State: Published
Organisations: IT University of Copenhagen
Contributors: Jensen, H. T. S. H., Mateo, J., Hansen, J. P.
Pages: 145-148
Publication date: 2010

**Host publication information**
Title of host publication: ETRA ‘10 - Proceedings of the 2010 Symposium on Eye-Tracking Research & Applications
Publisher: Association for Computing Machinery
ISBN (Electronic): 978-1-60558-994-7
DOIs:
10.1145/1743666.1743702
Research output: Research - peer-review › Article in proceedings – Annual report year: 2010
Gaze-controlled Driving
We investigate if the gaze (point of regard) can control a remote vehicle driving on a racing track. Five different input devices (on-screen buttons, mouse-pointing low-cost webcam eye tracker and two commercial eye tracking systems) provide heading and speed control on the scene view transmitted from the moving robot. Gaze control was found to be similar to mouse control. This suggests that robots and wheelchairs may be controlled "hands-free" through gaze. Low precision gaze tracking and image transmission delays had noticeable effect on performance.

General information
State: Published
Organisations: Safety, Reliability and Human Factors, Department of Management Engineering, Department of Informatics and Mathematical Modeling, Risø National Laboratory for Sustainable Energy, IT University of Copenhagen
Pages: 4387-4392
Publication date: 2009

Host publication information
Volume: SESSION: Spotlight on work in progress session 2
Place of publication: New York, NY, USA
Publisher: ACM Conference on Computer-Human Interaction
ISBN (Print): 978-1-60558-247-4
Keywords: control, input, wheelchair, Gaze, robot, mobile
DOIs:
10.1145/1520340.1520671
Source: orbit
Source-ID: 239997
Research output: Research - peer-review › Conference abstract in proceedings – Annual report year: 2009

Implementering af teknologi til mennesker med handicaps: Internationale forskningsresultater vedrørende implementeringsprocesser og anbefalinger til design af systemer

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Skovsgaard Hegner Jensen, H. T., Hansen, J. P., Tall, M.
Publication date: 2009

Publication information
Publisher: Socialt Udviklingscenter SUS
Original language: Danish
Research output: Commissioned › Report – Annual report year: 2009

Learning gaze typing: what are the obstacles and what progress to expect?
Gaze interaction is a promising input modality for people who are unable to control their fingers and arms. This paper suggests a number of new metrics that can be applied to the analysis of gaze typing interfaces and to the evaluation of user performance. These metrics are derived from a close examination of eight subjects typing text by gazing on a dwell-time activated onscreen keyboard during a seven-day experiment. One of the metrics, termed “Attended keys per
character”, measures the number of keys that are attended for each typed character. This metric turned out to be particularly well correlated to the actual numbers of errors committed \( r = 0.915 \). In addition to introducing metrics specific for gaze typing, the paper discusses how the metrics could make remote progress monitoring possible and provides some general advice on how to introduce gaze typing for novice users.

General information
State: Published
Organisations: Tokyo Institute of Technology, IT University of Copenhagen
Contributors: Aoki, H., Hansen, J. P., Itoh, K.
Pages: 297-310
Publication date: 2009
Peer-reviewed: Yes

Publication information
Journal: Universal Access in the Information Society
Volume: 8
Issue number: 4
ISSN (Print): 1615-5289
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.57 SJR 0.431 SNIP 1.48
Web of Science (2017): Impact factor 1.176
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.12 SJR 0.317 SNIP 0.942
Web of Science (2016): Impact factor 1.219
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.03 SJR 0.338 SNIP 1.054
Web of Science (2015): Impact factor 0.656
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.12 SJR 0.377 SNIP 1.002
Web of Science (2014): Impact factor 0.475
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.41 SJR 0.513 SNIP 1.52
Web of Science (2013): Impact factor 0.397
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.99 SJR 0.489 SNIP 0.828
Web of Science (2012): Impact factor 0.532
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.02 SJR 0.259 SNIP 1.104
Web of Science (2011): Impact factor 0.333
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.508 SNIP 1.66
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.421 SNIP 1.794
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.381 SNIP 0.824
Scopus rating (2007): SJR 0.564 SNIP 1.559
Scopus rating (2006): SJR 0.22 SNIP 0.74
Location-Based Services and Privacy in Airports
This paper reports on a study of privacy concerns related to location-based services in an airport, where users who volunteer for the service will be tracked for a limited period and within a limited area. Reactions elicited from travellers at a field trial showed 60% feeling to some or to a large degree more secure with the system in operation. To provide a background for the privacy study we also describe services provided by the tracking facility and the infrastructure behind it as well as the design and evaluation activities we used. Based on project results including a large number of comments from passengers, we discuss factors influencing passengers’ acceptance and appreciation of location-based services in airports.

General information
State: Published
Organisations: Safety, Reliability and Human Factors, Department of Management Engineering, IT University of Copenhagen
Number of pages: 928
Pages: 168-181
Publication date: 2009

Host publication information
Title of host publication: Human-Computer Interaction – INTERACT 2009, Proceedings
Volume: Part I
Publisher: Springer Berlin / Heidelberg
ISBN (Print): 978-3-642-03654-5
(Key Notes in Computer Science).
Keywords: Transport, Privacy, Location-based services, Mobile services, Technology acceptance, Tracking
DOIs:
10.1007/978-3-642-03655-2_21
URLs:
http://www.interact2009.org/
Source: orbit
Source-ID: 248575
Research output: Research - peer-review › Article in proceedings – Annual report year: 2009

Low-cost gaze interaction: Ready to deliver the promises

General information
State: Published
Organisations: IT University of Copenhagen
Pages: 4453-4458
Publication date: 2009

Host publication information
Publisher: Association for Computing Machinery
ISBN (Print): 978-1-60558-247-4
Research output: Research - peer-review › Article in proceedings – Annual report year: 2009

Low-cost gaze pointing and EMG clicking

General information
State: Published
Organisations: IT University of Copenhagen
Pages: 3247-3252
Single stroke gaze gestures

All eyes on the monitor: gaze based interaction in zoomable, multi-scaled information-spaces

The experiment described in this paper, shows a test environment constructed with two information spaces; one large with 2000 nodes ordered in semi-structured groups in which participants performed search and browse tasks; the other was smaller and designed for precision zooming, where subjects performed target selection simulation tasks. For both tasks, modes of gaze- and mouse-controlled navigation were compared. The results of the browse and search tasks showed that the performances of the most efficient mouse and gaze implementations were indistinguishable. However, in the target selection simulation tasks the most efficient gazecontrol proved to be about 16% faster than the most efficient mouse-control. The results indicate that gaze-controlled pan/zoom navigation is a viable alternative to mouse control in inspection and target exploration of large, multi-scale environments. However, supplementing mouse control with gaze navigation also holds interesting potential for interface and interaction design.

All eyes on the monitor: gaze based interaction in zoomable, multi-scaled information-spaces

The experiment described in this paper, shows a test environment constructed with two information spaces; one large with 2000 nodes ordered in semi-structured groups in which participants performed search and browse tasks; the other was smaller and designed for precision zooming, where subjects performed target selection simulation tasks. For both tasks, modes of gaze- and mouse-controlled navigation were compared. The results of the browse and search tasks showed that the performances of the most efficient mouse and gaze implementations were indistinguishable. However, in the target selection simulation tasks the most efficient gazecontrol proved to be about 16% faster than the most efficient mouse-control. The results indicate that gaze-controlled pan/zoom navigation is a viable alternative to mouse control in inspection and target exploration of large, multi-scale environments. However, supplementing mouse control with gaze navigation also holds interesting potential for interface and interaction design.

All eyes on the monitor: gaze based interaction in zoomable, multi-scaled information-spaces

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Gaze beats mouse: hands-free selection by combining gaze and EMG

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Mateo, J., San Agustin, J., Hansen, J. P.
Pages: 3039-3044
Publication date: 2008

Host publication information
Title of host publication: Conference on Human Factors in Computing Systems : CHI '08 extended abstracts on Human factors in computing systems
Publisher: Association for Computing Machinery
ISBN (Print): 978-1-60558-012-X
Research output: Research - peer-review › Article in proceedings – Annual report year: 2008

How Can Tiny Buttons Be Hit Using Gaze Only?

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Skovsgaard Hegner Jensen, H. T., Hansen, J. P., Mateo, J.
Pages: 38-42
Publication date: 2008

Host publication information
Title of host publication: Proceedings of COGAIN 2008 "Communication, Environment and Mobility Control by Gaze"
Publisher: CTU Publishing House
ISBN (Print): 978-80-01-04151-2
Research output: Research - peer-review › Article in proceedings – Annual report year: 2008

Learning to interact with a computer by gaze

General information
State: Published
Organisations: Tokyo Institute of Technology, IT University of Copenhagen
Contributors: Aoki, H., Hansen, J. P., Itoh, K.
Pages: 339-344
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Behaviour and Information Technology
Volume: 27
Issue number: 4
ISSN (Print): 0144-929X
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Noise tolerant selection by gaze-controlled pan and zoom in 3D

General information
State: Published
Off-the-Shelf Mobile Gaze Interaction

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: San Agustin, J., Hansen, J. P.
Pages: 6-10
Publication date: 2008

Off-the-Shelf Mobile Gaze Interaction

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: San Agustin, J., Hansen, J. P.
Pages: 6-10
Publication date: 2008

Three Ways of Globalizing IT Engineering Education: Experiences from Two European Universities
In this paper, we present three different mechanisms for globalising engineering education: (1) student and staff exchanges, (2) joint courses, where the students work in globally distributed teams; and (3) joint degree programmes. We argue that the three mechanisms complement each other and that successful globalisation within an institution can be archived by combining the three.
Our argument is based on the experiences of two north European universities, who successfully globalise their education.

Three Ways of Globalizing IT Engineering Education: Experiences from Two European Universities
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Our argument is based on the experiences of two north European universities, who successfully globalise their education.

General information
State: Published
Organisations: Uppsala University, IT University of Copenhagen
Contributors: Berglund, A., Gottlieb, M., Daniels, M., Glenstrup, A. J., Pears, A., Hansen, J. P.
Pages: 63-67
Publication date: 2008

Host publication information
Electronic versions:
Three_Ways_of_Globalizing.pdf
Research output: Research - peer-review › Article in proceedings – Annual report year: 2008

Zoom selection by gaze

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Jensen, H., Hansen, J. P., Mateo, J.
Publication date: 2008

Host publication information
Title of host publication: Proceedings. Scandinavian Workshop on Applied Eye Tracking
Research output: Research - peer-review › Article in proceedings – Annual report year: 2008
Robustifying Eye Interaction
This paper presents a gaze typing system based on consumer hardware. Eye tracking based on consumer hardware is subject to several unknown factors. We propose methods using robust statistical principles to accommodate uncertainties in image data as well as in gaze estimates to improve accuracy. We have succeeded to track the gaze of people with a standard consumer camera, obtaining accuracies about 160 pixels on screen. Proper design of the typing interface, however, reduces the need for high accuracy. We have observed typing speeds in the range of 3 - 5 words per minute for untrained subjects using large on-screen buttons and a new noise tolerant dwell-time principle.

General information
State: Published
Organisations: IT University of Copenhagen
Contributors: Hansen, D. W., Hansen, J. P.
Number of pages: 8
Publication date: 2006

Host publication information
Title of host publication: Proceedings of the 2006 Conference on Computer Vision and Pattern Recognition Workshop (CVPRW'06)
Publisher: IEEE
ISBN (Print): 0-7695-2646-2
DOIs: 10.1109/CVPRW.2006.181
Research output: Research - peer-review ; Article in proceedings – Annual report year: 2006

Gaze-guided viewing of Interactive movies
The idea of gaze-interactive movies is illustrated by a simple example movie that unfolds nondeterministically via an analysis of the interest of the viewer measured by the interpreted input from an eye tracker. We demonstrate how the amount of relative attention paid to key subjects of narrative importance may guide the outcome of a narrative branching. An experiment was conducted to test the operation of gaze guided film. The experiment involved 11 subjects influencing a two-minute film clip by gaze in two scenarios. In the first case subjects were aware that gaze could be used to control the narrative, and in the second case the subjects were unaware of this control. The outcome was found to be quite uniform across subjects, and it was not influenced by repetitions or by knowledge about the control option. Comments from the aware users indicated that they were looking for confirmation of gaze selections from the system. Thus, non-intrusive feedback seems to be fundamental for a successful gaze-interactive media. We suggest a range of discrete audio and visual effects that may serve this purpose and present some narrative control principles.

General information
State: Published
Organisations: IT University of Copenhagen
Pages: 193–204
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: Digital Creativity
Volume: 16
Issue number: 4
ISSN (Print): 1462-6268
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 0.59 SJR 0.252 SNIP 0.276
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 0.64 SJR 0.243 SNIP 0.804
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 0.35 SJR 0.228 SNIP 0.738
Command Without a Click: Dwell Time Typing by Mouse and Gaze Selections

With dwell time activation, completely hands free interaction may be achieved by tracking the user's gaze positions. The first study presented compares typing by mouse click with dwell time typing on Danish on-screen keyboard with 10 large buttons which change according to character prediction. The second study compares mouse and eye-gaze dwell input on a similar Japanese keyboard, but without dynamic changes. In the first study, dwell time selections tend to be a little slower and the overproduction is higher than with click selections. In the second study, mouse and gaze is almost equally fast, but mouse is far more precise than gaze. Consequently, the productivity in terms of characters per minute is 33% higher. The results suggest that users can be productive from the first encounter with dwell time activation, but productivity depends on their familiarity with the input structure and the input mode (i.e. hand or eye).

General information
State: Published
Organisations: IT University of Copenhagen, Tokyo Institute of Technology
Pages: 121-128
Publication date: 2003

Host publication information
Title of host publication: Human-Computer Interaction - INTERACT'03
Publisher: IOS Press
Editor: Rauterberg, M.
Electronic versions: Command_Without_a_Click.pdf
Research output: Research - peer-review : Book chapter – Annual report year: 2003

Data acquisition and analysis of cognitive processes

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Hauland, G., Andersen, H.
Pages: 335-349
Publication date: 2003

Host publication Information
Title of host publication: Handbook of human factors and ergonomics
Place of publication: Tokyo
Publisher: Asakura Publishing
Editors: Itoh, K., Komatsubara, A., Kuwano, S.
Eye Typing using Markov and Active Appearance Models

We propose a non-intrusive eye tracking system intended for the use of everyday gaze typing using web cameras. We argue that high precision in gaze tracking is not needed for on-screen typing due to natural language redundancy. This facilitates the use of low-cost video components for advanced multi-modal interactions based on video tracking systems. Robust methods are needed to track the eyes using web cameras due to the poor image quality. A real-time tracking scheme using a mean-shift color tracker and an Active Appearance Model of the eye is proposed. It is possible from this model to infer the state of the eye such as eye corners and the pupil location under scale and rotational changes.

General information
State: Published
Organisations: Department of Informatics and Mathematical Modeling
Pages: 132-136
Publication date: 2002

Host publication information
Title of host publication: IEEE Workshop on Applications of Computer Vision - WACV
URLs:
Source: orbit
Source-ID: 58172
Research output: Research - peer-review › Article in proceedings – Annual report year: 2002

Tracking Eyes using Shape and Appearance

We propose a non-intrusive eye tracking system intended for the use of everyday gaze typing using web cameras. We argue that high precision in gaze tracking is not needed for on-screen typing due to natural language redundancy. This facilitates the use of low-cost video components for advanced multi-modal interactions based on video tracking systems. Robust methods are needed to track the eyes using web cameras due to the poor image quality. A real-time tracking scheme using a mean-shift color tracker and an Active Appearance Model of the eye is proposed. From this model, it is possible to infer the state of the eye such as eye corners and the pupil location under scale and rotational changes. We use a Gaussian Process interpolation method for gaze determination, which facilitates stability feedback from the system. The use of a learning method for gaze estimation gives more flexibility to the choice of camera and its position.

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Department of Informatics and Mathematical Modeling
Pages: 201-204
Publication date: 2002

Host publication information
Title of host publication: IAPR Workshop on Machine Vision Applications - MVA
URLs:
Source: orbit
Source-ID: 58173
Research output: Research - peer-review › Article in proceedings – Annual report year: 2002

Combined analysis of verbal protocols and eye movements

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Hauland, G., Andersen, H.
Pages: 1323-1325
Publication date: 2001

Host publication information
Risk analysis of ship navigation by use of cognitive simulation

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Itoh, K., Yamaguchi, T., Hansen, J. P., Nielsen, F.
Pages: 4-21
Publication date: 2001
Peer-reviewed: Yes

Publication information
Journal: Cognition, Technology and Work
Volume: 3
ISSN (Print): 1435-5558
Ratings:
BFI (2019): BFI-level 2
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 1.66 SJR 0.641 SNIP 1.179
Web of Science (2017): Impact factor 1.26
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.18 SJR 0.48 SNIP 0.953
Web of Science (2016): Impact factor 1.105
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.14 SJR 0.459 SNIP 0.85
Web of Science (2015): Impact factor 0.987
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.67 SJR 0.648 SNIP 1.653
Web of Science (2014): Impact factor 1.308
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 1.53 SJR 0.542 SNIP 1.577
Web of Science (2013): Impact factor 1
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 0.83 SJR 0.396 SNIP 1.156
Web of Science (2012): Impact factor 0.659
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 0.81 SJR 0.381 SNIP 1.036
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.633 SNIP 1.323
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.674 SNIP 1.046
BFI (2008): BFI-level 1
Cognitive modeling of ship navigation and its application to risk analysis

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Itoh, K., Yamaguchi, T., Hansen, J. P., Nielsen, F.
Pages: 163-168
Publication date: 1999

Host publication information
Title of host publication: Proceedings
Place of publication: Valenciennes
Publisher: Presses Universitaires de Valenciennes
Editors: Hoc, J., Millot, P., Hollnagel, E., Cacciabue, P.
(EACE conference series; Lez Valenciennes, 1999, no 28).
Source: orbit
Source-ID: 299785
Research output: Research › Article in proceedings – Annual report year: 1999

Cognitive modelling of a ship navigator based on protocol and eye-movement analysis

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Itoh, K., Hansen, J. P., Nielsen, F.
Pages: 99-127
Publication date: 1998
Peer-reviewed: Yes

Publication information
Journal: Travail Humain
Volume: 61
ISSN (Print): 0041-1868
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Scopus rating (2017): CiteScore 0.67 SJR 0.281 SNIP 0.953
Web of Science (2017): Impact factor 0.879
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.4 SJR 0.189 SNIP 0.831
Web of Science (2016): Impact factor 0.697
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 0.29 SJR 0.209 SNIP 0.367
Web of Science (2015): Impact factor 0.3
Analysis of ship navigation based on cognitive modeling

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Itoh, K., Hansen, J. P., Nielsen, F.
Pages: 343-345
Publication date: 1997

Host publication information
Title of host publication: From experience to innovation. IEA '97. Vol. 6: Agriculture and food industry, construction work, dental work, traffic safety
Place of publication: Helsinki
Publisher: Finnish Institute of Occupational Health
Editors: Seppälä, P., Luopajärvi, T., Nygård, C., Mattila, M.
Source: orbit
Source-ID: 298606
Research output: Research - peer-review › Journal article – Annual report year: 1998

Cognitive task analysis of ship navigation by use of verbal protocols and eye-movement data

Research output: Research › Article in proceedings – Annual report year: 1997
Comparing transfer of training of a standard control panel and a touchscreen panel

Multi-modal recording and analysis of interaction among operators and work systems

An experimental investigation of configural, digital, and temporal information on process displays
Building a cognitive model of dynamic ship navigation on basis of verbal protocols and eye-movement data
Cognitive task analysis by use of verbal protocols and eye-movement data and its application to ship navigation task

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Itoh, K., Hansen, J. P.
Pages: 230-231
Publication date: 1995
Peer-reviewed: Yes

Publication information
Volume: 31
ISSN (Print): 1884-2844
Original language: English
DOIs: 10.5100/jje.31.Supplement_230
Source: orbit
Source-ID: 293977
Research output: Research - peer-review › Journal article – Annual report year: 1995

Eye-gaze control of multimedia systems

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Andersen, A., Roed, P.
Pages: 37-42
Publication date: 1995

Host publication information
Title of host publication: Symbiosis of human and artifact. Future computing and design for human-computer interaction. Proceedings. Vol. 1
Place of publication: Amsterdam
Publisher: Elsevier
Editors: Anzai, Y., Ogawa, K., Mori, H.
(Advances in Human Factors/Ergonomics, 20A).
DOIs: 10.1016/S0921-2647(06)80008-0
Source: orbit
Source-ID: 293851
Research output: Research › Article in proceedings – Annual report year: 1995

Fleksible kontrolpaneler sparer penge og øger sikkerheden til lands til vands og i luften

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Flexible control panels save money and increase safety

Multi-modal recording and analysis of operator data

Nesting of configural, digital and temporal process information: The time tunnel example
Nesting of configural, digital and temporal process information: The time tunnel example

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy
- **Contributors:** Hansen, J. P.
- **Publication date:** 1995
- **Peer-reviewed:** No
- **Event:** Abstract from IGSS Conference, Copenhagen (DK), 8-9 Jun, .
- **Source:** orbit
- **Source-ID:** 293923

Representation of system invariants by optical invariants in configural displays for process control

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy
- **Contributors:** Hansen, J. P.
- **Pages:** 208-233
- **Publication date:** 1995

**Host publication information**
- **Title of host publication:** Local applications of the ecological approach to human-machine systems
- **Place of publication:** Hillsdale, NJ
- **Publisher:** Lawrence Erlbaum Associates
- **Editors:** Hancock, P., Flach, J., Caird, J., Vicente, K.
- **Source:** orbit
- **Source-ID:** 293502

Requirements to experimental facilities

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy
- **Contributors:** Hansen, J. P.
- **Publication date:** 1995
- **Peer-reviewed:** No
- **Event:** Abstract from Long-term development of the Halden Man-Machine Laboratory (HAMMLAB). Institutt for Energiteknikk, Halden (NO), 15-16 Jun, .
- **Source:** orbit
- **Source-ID:** 293920

Simulation of skill acquisition in sequential learning of a computer game

The paper presents some theoretical assumptions about the cognitive control mechanisms of subjects learning to play a computer game. A simulation model has been developed to investigate these assumptions. The model is an automaton, reacting to instruction-like cue action rules. The prototypical performances of 23 experimental subjects at succeeding levels of training are compared to the performance of the model. The findings are interpreted in terms of a general taxonomy for cognitive task analysis.

**General information**
- **State:** Published
- **Organisations:** Risø National Laboratory for Sustainable Energy, Department of Management Engineering
- **Contributors:** Hansen, J. P., Nielsen, F. R., Rasmussen, J.
- **Pages:** 351-370
- **Publication date:** 1995
- **Peer-reviewed:** Yes
Sjælens spejl kan styre tv

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 12-13
Publication date: 1995
Peer-reviewed: Unknown
The use of eye gaze control in public systems

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1995
Peer-reviewed: No
Event: Abstract from 8. European conference on eye movements, Derby (GB), 6-9 Sep, .
Source: orbit
Source-ID: 293657
Research output: Research › Conference abstract for conference – Annual report year: 1995

Tryk på en knap

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Andersen, H., Hansen, J. P.
Pages: 12-14
Publication date: 1995
Peer-reviewed: Unknown

Ecological interface design: Visualisation of domain knowledge and mental strategies based on a cognitive analysis of expert tasks

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Number of pages: 95
Publication date: 1994
Ergonomiundersøgelser i simulater

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 3-6
Publication date: 1994
Peer-reviewed: No

Publication information
Journal: Nordisk Ergonomi
Volume: 12
Issue number: 1
Original language: Danish
Source: orbit
Source-ID: 292506
Research output: Research › Journal article – Annual report year: 1994

Eye movement recordings used for simulator validations

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1994
Peer-reviewed: No
Source: orbit
Source-ID: 292384
Research output: Research › Conference abstract for conference – Annual report year: 1994

Fremtidens brugergrænseflader

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1994
Peer-reviewed: No
Event: Abstract from SESAM-møde nr. 27. Proceskontrol, brugervenlighed og åbenhed, København (DK), 18 May.
Source: orbit
Source-ID: 292602
Research output: Research › Conference abstract for conference – Annual report year: 1994

MULTIMO: Multi-model technologies for recording and analysing operator behaviour

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Andersen, H., Andersen, A.
Publication date: 1994
Peer-reviewed: No
Event: Abstract from OECD Halden reactor project workshop on evaluation methods and measurements, and data analysis in system test and evaluation, Bolkesjø (NO), 30 Oct - 4 Nov.
Source: orbit
Source-ID: 291699
Research output: Research › Conference abstract for conference – Annual report year: 1994

Perception og interaktion
Udvikling af fremtidens HMI i fly

Virkelig kunstighet

A generic multi-media concept for eye tracking technologies

Anæstetistens perception: Hvad ser han/hun faktisk?
Kognitive ergonomiundersøgelser i simulators

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 181-187
Publication date: 1993

Host publication information
Title of host publication: Ergonomi och företagsekonomi
Place of publication: Åbo
Publisher: Painosalama Oy
Editor: Landor, U.
Source: orbit
Source-ID: 291101
Research output: Research › Article in proceedings – Annual report year: 1993

Undersøgelse af en fuldskala-simulators potentialer ved arbejdsanalyse og personaletræning inden for det maritime område

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1993
Peer-reviewed: No
Source: orbit
Source-ID: 291298
Research output: Research › Conference abstract for conference – Annual report year: 1993

Validating the cognitive fidelity of simulated realities

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Byrsting Jakobsen, V.
Pages: 241-250
Publication date: 1993

Host publication information
Title of host publication: Informatique ’93
Place of publication: Paris
Publisher: Centre Francais d'Exploitation du Droit de Copie
Editors: Haton, J., Mackay, W., Rault, J.
Source: orbit
Source-ID: 291457
Research output: Research - peer-review › Article in proceedings – Annual report year: 1993

Validering af virtuelle verdeners kognitive realisme

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1993
Peer-reviewed: No
Virkelig kunstighed

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1993
Peer-reviewed: Unknown

Publication information
Journal: Weekendavisen
Issue number: 19-25 November
ISSN (Print): 0106-4142
Ratings:
ISI indexed (2013): ISI indexed no
ISI indexed (2012): ISI indexed no
ISI indexed (2011): ISI indexed no
Original language: Danish
Source: orbit
Source-ID: 290835
Research output: Communication › Journal article – Annual report year: 1993

Virtuelle verdener og simulering

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1993
Peer-reviewed: No
Event: Abstract from SIMSEM 93, Oslo (NO); Kiel (DE), 15-17 Nov, .
Source: orbit
Source-ID: 290766
Research output: Research › Conference abstract for conference – Annual report year: 1993

Virtuelle verdener og simulering

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1993
Peer-reviewed: No
Event: Abstract from Virtual reality - et teknologivurderingsprojekt. Teknologinævnet, København (DK), 14 Oct, .
Source: orbit
Source-ID: 290767
Research output: Research › Conference abstract for conference – Annual report year: 1993

A methodological approach to the verification of cognitive models by simulating computer game playing

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Rasmussen, J.
Pages: 86-106
Publication date: 1992

Host publication information
Information nesting in configural interfaces for process control

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Number of pages: 28
Publication date: 1992

Publication information
ISBN (Print): 87-550-1797-5
Original language: English
(Denmark. Forskningscenter Risoe. Risoe-R; No. 616(EN)).
Keywords: Risø-R-616, Risø-R-616(EN)
Electronic versions:
Ris_R_616.pdf
Source: orbit
Source-ID: 290401
Research output: Research › Report – Annual report year: 1992

På Risø kigger de ikke kun atomer

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1992
Peer-reviewed: No
Source: orbit
Source-ID: 289868
Research output: Research › Conference abstract for conference – Annual report year: 1992

The use of maritime simulators for training and personal evaluation: The importance of simulator fidelity

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Publication date: 1992
Peer-reviewed: No
Event: Abstract from The ESPRIT workshop on the use of microworlds in training, education and research, Lübeck (DE), 20-22 May, .
Source: orbit
Source-ID: 290126
Research output: Research › Conference abstract for conference – Annual report year: 1992

Datamaskiner skal integriere logiske procedurer og intuitive genkendelser

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 241-242
Publication date: 1991
Peer-reviewed: No
Et øje-bliks informationer

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 13-16
Publication date: 1991
Peer-reviewed: Unknown

Graphical remembering: Making the past present in order to see the future

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Number of pages: 256
Publication date: 1991

Host publication information
Title of host publication: Interface 91. Proceedings
Place of publication: Santa Monica, CA
Publisher: Human Factors Society
Source: orbit
Source-ID: 289066
Research output: Communication › Journal article – Annual report year: 1991

Simulation of cognitive behaviour in computer games

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy, Risø National Laboratory
Contributors: Hansen, J. P., Løvborg, L., Rasmussen, J.
Pages: 39-72
Publication date: 1991

Host publication information
Title of host publication: Cognitive processes and resources. Proceedings. Vol. 2
Place of publication: Roskilde
Publisher: Risø National Laboratory. Cognitive Systems Group
Editors: Andersen, H., Pedersen, S., Cacciabue, C., Reason, J.
Electronic versions:
GYMGIRL.PDF
Source: orbit
Source-ID: 288933
The use of eye mark recordings to support verbal retrospection in software testing

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 31-49
Publication date: 1991
Peer-reviewed: Yes

Publication information
Journal: Acta Psychologica
Volume: 76
ISSN (Print): 0001-6918
Ratings:
  BFI (2019): BFI-level 2
  Web of Science (2019): Indexed yes
  BFI (2018): BFI-level 2
  Web of Science (2018): Indexed yes
  BFI (2017): BFI-level 2
  Scopus rating (2017): CiteScore 2.2 SJR 1.331 SNIP 1.064
  Web of Science (2017): Impact factor 1.862
  Web of Science (2017): Indexed yes
  BFI (2016): BFI-level 2
  Scopus rating (2016): CiteScore 2.15 SJR 1.323 SNIP 0.994
  Web of Science (2016): Impact factor 2.031
  BFI (2015): BFI-level 2
  Scopus rating (2015): CiteScore 2.16 SJR 1.335 SNIP 0.894
  Web of Science (2015): Impact factor 1.816
  BFI (2014): BFI-level 2
  Scopus rating (2014): CiteScore 2.46 SJR 1.37 SNIP 1.162
  Web of Science (2014): Impact factor 2.248
  BFI (2013): BFI-level 2
  Scopus rating (2013): CiteScore 2.69 SJR 1.68 SNIP 1.287
  Web of Science (2013): Impact factor 2.367
  BFI (2012): BFI-level 2
  Scopus rating (2012): CiteScore 2.45 SJR 1.476 SNIP 1.191
  Web of Science (2012): Impact factor 2.206
  BFI (2011): BFI-level 2
  Scopus rating (2011): CiteScore 2.55 SJR 1.492 SNIP 1.409
  Web of Science (2011): Impact factor 2.255
  BFI (2010): BFI-level 2
  Scopus rating (2010): SJR 1.471 SNIP 1.275
  Web of Science (2010): Impact factor 2.246
  BFI (2009): BFI-level 2
  Scopus rating (2009): SJR 1.59 SNIP 1.079
  BFI (2008): BFI-level 2
  Scopus rating (2008): SJR 1.339 SNIP 1.229
  Scopus rating (2007): SJR 1.298 SNIP 1.378
  Scopus rating (2006): SJR 1.229 SNIP 1.334
  Scopus rating (2005): SJR 1.067 SNIP 1.105
  Scopus rating (2004): SJR 1.299 SNIP 0.927
  Scopus rating (2003): SJR 1.186 SNIP 0.94
  Scopus rating (2002): SJR 1.382 SNIP 0.941
Hints for cognitive modelling of skill learning

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P., Løvborg, L.
Pages: 171-182
Publication date: 1990

Host publication information
Title of host publication: Human decision making and manual control
Place of publication: Ispra
Publisher: Commission of the European Communities
Source: orbit
Source-ID: 288496
Research output: Research › Article in proceedings – Annual report year: 1990

Mental workload and decision making

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Ketscher, L., Hansen, J. P.
Pages: 161-169
Publication date: 1990

Host publication information
Title of host publication: Human decision making and manual control
Place of publication: Ispra
Publisher: Commission of the European Communities
Source: orbit
Source-ID: 288498
Research output: Research › Article in proceedings – Annual report year: 1990

Øjenbevægelser viser hvordan vi tænker

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Hansen, J. P.
Pages: 4-5
Publication date: 1990
Peer-reviewed: No

Publication information
Journal: Risønyt
Issue number: 1
Original language: Danish
Source: orbit
Source-ID: 287202
Research output: Research › Journal article – Annual report year: 1990

Optagelser af visuelle orienteeringer

General information
Datamater og dannelse

Krop og kognition

Perspectives on Analog Interfaces
Viden-indhentning og -modellering: Et nyt arbejdsområde for psykologer?

General information
State: Published
Organisations: Risø National Laboratory for Sustainable Energy
Contributors: Bærentsen, K., Hansen, J. P.
Pages: 370-397
Publication date: 1989
Peer-reviewed: No

Publication information
Journal: Psyke & Logos
Volume: 9
Issue number: 2
ISSN (Print): 0107-1211
Ratings:
BFI (2015): BFI-level 1
BFI (2014): BFI-level 1
BFI (2013): BFI-level 1
ISI indexed (2013): ISI indexed no
BFI (2012): BFI-level 1
ISI indexed (2012): ISI indexed no
BFI (2011): BFI-level 1
ISI indexed (2011): ISI indexed no
BFI (2010): BFI-level 1
BFI (2009): BFI-level 1
BFI (2008): BFI-level 1
Original language: Danish
Source: orbit
Source-ID: 288094
Research output: Research › Journal article – Annual report year: 1989

Projects:

**Communication keyboards for people with special needs**
Bafna, T., PhD Student, Department of Management Engineering
Hansen, J. P., Main Supervisor, Department of Management Engineering
Bækgaard, P., Supervisor, Department of Applied Mathematics and Computer Science
Puthusserypady, S., Supervisor, Department of Electrical Engineering
Institut stipendie (DTU)
01/04/2018 → 31/03/2021
Award relations: Communication keyboards for people with special needs
Project: PhD

**Patient Training for Gaze Controlled Telepresence**
Zhang, G., PhD Student, Department of Management Engineering
Hansen, J. P., Main Supervisor, Department of Management Engineering
Bardram, J. E., Supervisor, Copenhagen Center for Health Technology

Forskningsrådsstipendium
01/02/2018 → 31/01/2021
Award relations: Patient Training for Gaze Controlled Telepresence
Project: PhD

GazeIT: GazeIT – Accessibility by Gaze Tracking
Hansen, J. P., Project Participant, Copenhagen Center for Health Technology, Department of Management Engineering, Technology and Innovation Management
01/04/2016 → 31/03/2021
Project: Research

Enhancing Creativity - Metacognitive Training for Innovation Practitioners’?
Valgeirsdóttir, D., PhD Student, Department of Management Engineering
Onarheim, B., Main Supervisor, Department of Management Engineering
Li-Ying, J., Supervisor, Department of Management Engineering
Hansen, J. P., Examiner, Department of Management Engineering
Ball, L., Examiner
Runco, M. A., Examiner
Ball, L., Examiner
Runco, M. A., Examiner

Institut stipendie (DTU)
01/12/2014 → 16/04/2018
Award relations: Enhancing Creativity - Metacognitive Training for Innovation Practitioners’?
Project: PhD

Design and implementation of personal networked information appliance interfaces
Larsen, J. E., PhD Student, Department of Applied Mathematics and Computer Science
Rose, M., Main Supervisor, Department of Applied Mathematics and Computer Science
Frekjaer, E., Examiner
Hansen, J. P., Examiner, Department of Management Engineering
Havn, E. C., Examiner, Department of Photonics Engineering

DTU-lønnet stipendie
01/11/1999 → 22/04/2005
Award relations: Design and implementation of personal networked information appliance interfaces
Project: PhD

Design methods for supporting the adaption and design of products for emerging markets
Li, X., PhD Student, Department of Management Engineering
Li-Ying, J., Main Supervisor, Department of Management Engineering
Daalhuizen, J., Supervisor, Department of Management Engineering
Hansen, J. P., Examiner, Department of Management Engineering
Jensen, T. A., Examiner, Department of Control and Engineering Design
Kandchar, P., Examiner
Daalhuizen, J., Supervisor
Kandchar, P., Examiner
Eksternt finansieret virksomhed
01/12/2013 → 07/09/2017
Award relations: Design methods for supporting the adaption and design of products for emerging markets
Project: PhD

Methods to support creative processes at the early stages of product development
Cramer-Petersen, C. L., PhD Student, Department of Management Engineering
Ahmed-Kristensen, S., Main Supervisor, Department of Management Engineering
Christensen, B. T., Supervisor
Hansen, J. P., Main Supervisor, Department of Management Engineering
Ahmed-Kristensen, S., Supervisor, Department of Management Engineering
Hansen, C. T., Examiner, Department of Mechanical Engineering
Badke-Schaub, P., Examiner
Valkenburg, R., Examiner

Institut stipendie (DTU)
This presentation suggests using rapid serial visual presentation (RSVP) of single Words for prompting command options that may be executed by gaze-strokes. In a study with 27 participants the RSVP commands would engage a near-by display; adjust the speed of Word presentation; and provide a “back” option for text navigation. People readily understood how to execute RSVP command prompts and a majority of them preferred gaze input to a pen pointer. We present the concept of a smartwatch that can track eye movements and mediate command options whenever in proximity of intelligent devices that it connects with, i.e. a Gaze-Watch. For instance, standing next to a monitor, it may suggest to turn it on, if you look up at the monitor now. Command suggestions are provided in the RSVP-format, but they only stay active for a limited time, in which the gaze should be moved to apply them.