NEWSLETTER
of the Europe Chapter of the Human Factors and Ergonomics Society

No. 2 / 2015

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chapter

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Editorial

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Dear Colleagues,

in the Europe Chapter's business meeting in Groningen, the idea was brought up to include a new section into the newsletter that is dedicated to the announcement of recent publications of our members – details and an example can be found on the next page.

Other topics covered in the business meeting and recent developments in the Europe Chapter can be found in the business minutes on page 15. If you couldn't attend the meeting, you can get an impression of the meeting from the conference report on page 7 and learn about the winners of the Europe Chapter Awards on page 5.

VRC grant reports of applied research for the industry as well as of innovative neuroergonomic lab research start on page 15. And don't miss the book review section (p. 20) to read reviews of recent Ashgate books and to pick an even more recent book to review yourself!

With best wishes for a happy and successful new year 2016,
Stefan Röttger

Publications of Members

This section shall give our Europe Chapter members the opportunity to announce recent peer reviewed publications, books and book chapters in the English language. This way, you can attract the attention of the European HF/E community to your publications, and become aware of recent developments and lines of work of other chapter members.

As an example, you can find a recent publication from the winner of the 2015 HFES Best Poster Award below.

Eco-driving strategies in battery electric vehicle use–how do drivers adapt over time?
In: *Intelligent Transport Systems, 9*(7), 746-753.
DOI: 10.1049/iet-its.2014.0221

By Neumann, I., Franke, T., Cocron, P., Bühler, F., & Krems, J. F. (2015).
TU Chemnitz, Cognitive and Engineering Psychology

If you would like to have your publication included in this section of the next newsletter, please send the bibliographic information and the affiliation of the first author to editor@hfes-europe.org!

HFES Europe Chapter Awards 2015

Early Career Best Paper Award

Dietrich Manzey
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A total of 12 papers were submitted for the 2015 competition. Each paper was reviewed by three members of the review committee including (in alphabetical order): Karel Brookhuis, Dick de Waard, Dietrich Manzey, Natasha Merat, Ben Mulder, Linda Onnasch, Stefan Röttger, Clemens Weikert and Rebecca Wiczorek. Scores between 1-10 were provided for 12 different aspects like quality of writing, originality, theoretical foundation, quality and appropriateness of study design, and quality of discussion. Based on these scores, the committee decided to honour four papers which all had got mean ratings of above 7.

Two contributions, submitted by Frederik Naujoks (co-authored by Heidi Grattenthaler, Alexandra Neukum, Galia Weidl and Dominik Petrich) and Lena Rittger (co-authored by Andrea Kiesel, Gerald Schmidt and Christian Maag) were put on the third rank. The papers adressed questions concerning the driver interaction with warnings and a new approach to assess attention allocation while driving, and convinced primarily by their theoretical foundation and experimental study design.

The second rank was achieved by Isabel Neumann with a paper co-authored by Thomas Franke, Peter Cocron, Franziska Bühler, and Josef F. Krems, describing a field-study on issues of Eco-driving. The committee was impressed by the quality of field research presented in this contribution.

This year's Early Career Best Paper Award was dedicated to Francesco Biondi for an article published in Human Factors, co-authored by David L. Strayer, Ricardo Rossi, Massimiliano Gastaldi and Claudio Mulatti. The article presents two driving simulator experiments in which the effectiveness of multimodal warnings as part of a collision avoidance systems was evaluated. The results show that multimodal redundant warnings elicit faster braking responses than unimodal auditory or vibrotactile cues. This finding does not only contribute to a better understanding of processing of multimodal cues but has also concrete practical implications. The committee was particularly impressed by the concise and clear design of the experiments based on strong theoretical considerations, and a very straightforward data analysis.

Best Poster Award

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Joke van Dijken, Arjan Stuiver, Luca Pietrantoni, Denis Coelho and Jürgen Sauer served as members of the 2015 best poster award committee, which was presided by Berfu Ünal from University of Groningen. None of them was

member of the best paper committee. This is important to note, because the best poster prize was awarded to Isabel Neumann, the runner up in the competition for the Early Career Best Paper Award! The title of her winning poster was *Eco-Padling: Manpower versus support level assistance*. Congratulations, Isabel!

Francesco Biondi (left) and Isabell Neumann (right) accepting their awards at the HFES Europe Chapter Annual Meeting in Groningen.

Conference Report Groningen 2015

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In 2015, the Human Factors and Ergonomics Society Europe Chapter Conference was held in the attractive city of Groningen. Groningen has a picturesque historic centre that was awarded the title of Best City Centre in the Netherlands and that allows visitors to feel 'at home'.

The Conference was hosted by the University of Groningen, in particular the local conference organizers work at the Department of Psychology, the Traffic Psychology group. After 1996, this was the second time that the University of Groningen has organized the event. This conference took place from 14th to 16th October 2015 at the Groninger Forum, a convenient facility downtown Groningen and whose conference room was made very cosy by the beautiful Groningen views displayed on walls.

The central theme was *Human Factors & User Experience in everyday life, medicine, and work*. The keynote presentation was given by Douwe Draaisma, who is Professor of the History of Psychology at the University of Groningen. Professor Draaisma provided a really inspiring presentation titled *Why traffic speeds up as you get older,* paraphrasing the title of his very well-known book *Why Life Speeds Up as You Get Older.* In this lecture he reflected on how memory shapes human past, giving very interesting examples, accompanied by evocative pictures, about the fact that humans are poor timekeepers and how this characteristic gets worse with age. Explaining how elderly persons are susceptible to temporal illusions (e.g. they date events too far back in time, overestimate the length of shorter periods of time…) he gave a window on a range of interesting neurological and cognitive processes.

The Conference included a three day program consisting of single tracks and a poster session. Topics considered during the ten sessions talks and in poster session were in relation to surface transportation and vulnerable road users, human-machine interaction in different domains (e.g. ground vehicles, websites, security…), fitness to drive and healthy ageing, mental workload, aviation, safety culture and work domain analysis. In all sessions, there were interesting presentations to which participants paid much attention as witnessed also by questions addressed to the speakers during both talks and the poster session. Among all the valuable presentations two, done by Prof. Karel Brookhuis and Prof. Dietrich Manzey, distinguished Officers of the Europe Chapter, can be highlighted because they can be considered as two additional shorter keynotes for their deep appeal. There was a *Best Poster Award* for the best poster of the Conference, based on the presentation that was made by the various authors during the forty seconds *Talking Poster* session and of course on the poster itself. Moreover, The *Early Career Best Paper Prize* for the first or second journal article recently published, submitted for publication or a manuscript ready for submission to a journal was awarded again.

Beyond the scientific knowledge what is special about the HFES EC Annual Conferences is the friendly, informal and welcoming atmosphere that is always present. And also this time, the about 100 delegates from Europe, USA, Japan and Israel that attended the Groningen HFES EC Conference enjoyed

both the scientific and the social program that included a nice dinner at the WEEVA Restaurant, which allowed to taste the old and good Groningen cuisine together with friends. What's best?!

Hope you will join us at next HFES EC Conferences to experience all of this!

Antonella Toffetti from Centro Ricerche Fiat (Torino, Italy) is the current President of the HFES Europe Chapter.

Minutes Business Meeting in Groningen

Dick de Waard
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1. Opening, quorum, announcements

Antonella Toffetti, Dietrich Manzey, Karel Brookhuis, Stefan Röttger, Clemens Weikert, Dick de Waard (minutes). Actions in blue.

Antonella opens the meeting. Quorum established. Antonella proposes a few issues (below) to increase interest in the chapter; When a "→" is inserted, the response of the Boardmembers is following.

- Each December we have a post on Linkedin with a short overview of the HFES EC activities (e.g. conference, Grant…) and how to enroll (first year for free and after that a low fee…); Each Spring we have a post on Linkedin to highlight the conference Call for Abstract and Early Career Paper Award. → It was decided to aim to post more on LinkedIn (all who have an account)
- Ask HFES for a discount for HFES EC members to annual registration fee and to annual conference fee. → Deemed not feasible
- Ask other publishers apart from Ashgate (e.g. Taylor & Francis, SAGE) for a discount. → No one has made use of the Ashgate discount, so probably not worth to invest effort.
- Toolkit for members, recommended readings:
  - o → Toolkit requires updates but this proposal is being considered.
  - o → General question is who has time? (all)
- Host / stimulate Webinars [= slides + someone speaking-voice only+ chance to chat] from HFES. → Dietrich first attended, but frequency went down. Do Chapter members have access, or only HFES members? Dietrich will try to discuss this with Lynn Strother @ HFES meeting in 2 weeks.
- → Include recent (accepted) English language journal & book publications of members in newsletter (Stefan includes a call in the next newsletter).

2. Minutes 2014 Business meeting in Lisbon (sent by email & in newsletter)

Accepted.

3. President's report [Antonella]

- HFES USA conference October 27–31 2014 in Chicago, anyone visited, anyone going to HFES 2015 in LA (October 26-30)? → Dietrich will represent the chapter in LA.

4. Secretary's report [Dick de Waard]

- Paid website support was extended to avoid Wordpress update errors. In general the website is well received

5. Treasurer's report [Karel Brookhuis]

For practical reasons the active service of Karel commences October 1st, Clemens (acting treasurer) provides the report. Karel is busy opening bank account; this requires amongst others that the Chapter needs to be registered in the Chamber of Commerce as a not-for-profit organisation, and that requires several (sometimes translated into Dutch) signed docs. We are almost there.

Report:

Europe Chapter HFES Financial statement per October 12, 2015				
	Chapter		**VRC**	
	EUR	**SEK**	**EUR**	**SEK**
Ingoing balance	**57943.36**	**167018.20**	**21857.23**	**33679**
Benefits				
Membership dues	2975.04	3711		
VRC Grant			3961.65	
Balance Lisbon conf. 2014	6208			
Total benefits	**9183.04**	**3711**	**3961.65**	
Costs				
Conf costs 2015		5838		
Conf. Costs 2014	686.19	13310		
Keynote costs 2014		8759.38		
VRC Grant Suter			1150	
VRC Grant Andreessen			500	
VRC Grant Bedinger			1200	
Convident (homepage)	121	5036.92		
Bank costs		1500		
Total costs	**807.19**	**34444.30**	**2850**	
Outgoing balance	**66319.21**	**136284.90**	**22968.88**	**33679**

Please note that the overall balance of the Lisbon conference is **not** positive, as the loss is about Euro 12000 (due to 13600 advance payment) and last minute changes.

The following decision was made (to be able to transfer the account):

The Executive Council of the Europe Chapter of the Human Factors and Ergonomics Society decides that:
1) In order to enable him to transfer the total account budget, the past treasurer, Clemens Weikert, is authorised to have full disposal of all the Europe Chapter's accounts in Handelsbanken, both via internet and at the office of the bank. There shall be no limit of amounts. Furthermore, Clemens Weikert is authorised to close the Chapter's accounts in Handelsbanken as soon as the Europe Chapter's new bank account in the Netherlands is established.
2) The secretary of the Chapter, Dick de Waard is authorised to sign the authorisation (power of Attourney) for Clemens Weikert

 Signed: President, Antonella Toffetti   Secretary, Dick de Waard

6. PR

Newsletter [Stefan Röttger]
   Nothing to report, but compliments for Stefan! A student help would be appreciated, does anyone know someone who would like to volunteer? Perhaps send an email to our members?

7. "Chapter's Early Career Paper Award" [Dietrich Manzey]

After a second call many papers were submitted. We have certificates for: 1st Francesco Biondi, 2nd Isabel Neumann, 3rd: Frederik Naujoks & Lena Rittger. Dietrich volunteers to continue this work with the help of reviewers, similar as done the past years.

8. Reports from VRC Grant committee [Dick de Waard]

We received another donation from VRC. Three applications were awarded (Suter, Anddrees, Bedinger);
We cannot find any reports about their stay, which should have been submitted. Stefan and Dick will enquire.

9. Membership Committee report [Dick de Waard]

- New members, ended memberships
  In total 17 new, 48 left or were terminated (see below). We have 202 members now.

New Members	Affil	Country	Class
1. Barbara Frank	University of Bochum	D	S
2. Martin Jentsch	TU Chemnitz	D	C
3. Christopher D Cabrall	TU Delft	NL	S
4. Hui Yang	Saltside Technologies AB	SE	C
5. Daniel Bradley	Bournemouth University	UK	S
6. Paul Ward	University of Huddersfield	UK	M
7. Bruno Giesteira	University of Porto	PT	C
8. Sine McDougall	Bournemouth University	UK	C
9. Amon Rambaldini	CRF	I	C
10. Sabine Kipp	Fresenius Medical Care D GmbH	D	M
11. Neil Whisler	Amey PLC	UK	C
12. Alan Grincell	Institute of Technology Carlow	IE	S
13. Antonella Frisiello	Istituto Superiore Mario Boella - ISMB	I	C
14. Alin L.D. Gaureanu	Proform Office	RO	A
15. Niels G. Brandenburger	DLR	D	A
16. Phillip Tretten	Luleå University of Technology	SE	C
17. Malte Klüver	Daimler AG	D	A

Membership that we terminated or members who left

1. AKSELSSON, ROLAND; quit membership (pension)	07.10.2014
2. ALASTAIR GALE, quit membership	01.01.2015
3. RICHTER, JULIANE, quit membership	01.03.2015
4. McLEOD, RON, thought membership fee was included	22.04.2015
5. KEARNEY, PETER, now perceives little benefit from membership	22.04.2015
6. LARBURU LOPEZ, MAIDER, quit membership	27.04.2015
7. CIOBANU, Petru OCTAVIAN, quit membership after dues statement	25.05.2015
8. MARTINEZ-SORIA, JOSE L, quit membership after dues statement	25.05.2015
9. GANßAUGE, RICO, quit membership after dues statement	01.06.2015
10. MELBYE, SYLJE, quit membership after dues statement	05.06.2015

- It was decided to lower tolerance of non-payment to three membership years, i.e. after two years of no payment membership is discarded (note: year 1 is fee free).

38 Memberships we terminated

| Name	Affil	Country	Years not paid
AFACAN, MUSTAFA	Turkish Airlines	TR	3
ARIAL, MARC	SECO, Work and Health	CH	3
ARVIDSSON, MARCUS	MTO Säkerhet	SE	3
BAHNER, ELIN	Berlin University of Technology	DE	5
BARITZ, MIHAELA IOANA	Univ. Transilvania of Brasov	O	5
BITTERMAN, NOEMI	Technion	IL	5
BOLAND, EDZARD	NLR	NL	4
BROSNAN, MÉADHBH	Maastricht University	NL	3
CAMILLI, MARCO	UXI Srl	I	4
DICKETY, NICHOLAS, M.	Health and Safety Lab	UK	4
DOMBERT, PASCASIE L.	Maastricht University	NL	4
EIRIKSDOTTIR, ELSA	Georgia Institute of Technology	IS	4
FEUFEL, MARKUS A.	Harding Center for Risk Literacy	DE	3

FLEMISCH, FRANK O.	RWTH Aachen University	DE	4
GRAHAM, MARTA L.	NATO	BE	5
GRAY, ROBERT	University of Birmingham	UK	4
HERTBERT, NICHOLAS C.	ITS University of Leeds	UK	3
HOCKEY, G.R.J.	University of Sheffield	UK	5
JOHNSON ADDIE	University of Groningen	NL	3
KAVANAGH, JOHN P.	Netjets Europe	PT	4
KAY, ALISON	Trinity College dublin	IE	4
KRAJEWSKI, JAREK	University of Wuppertal	DE	3
KURITZ-KAISER, ANTHEA	Unaff.	DE	5
LIM,WILLIAM SHI WAI	MTR	HK	5
MAAKIP, ISMAIL B.	Universiti Malaysia Sabah	MY	5
MARCHAND, ANNE LISE	French Air Force Research Ctr	FR	3
MOHD HASNI, YASMIN	MARINE DEPT MALAYSIA	MY	3
NAIDU, SHIVASHANKAR	Wichita State University	US	4
PETRATOU, MARIA	BIC, Group R&D Shavers	GR	3
PSIMADAS,YIANNIS MARIOS	BIC, Group R&D Shavers	GR	4
RIGG, JAKE	JRJA Panopticon Policy	UK	4
ROBIN, GUILAINE	Université de Metz	FR	3
SACCO, GIORGIO	Ente Nazionale Aviazone Civile	I	3
VAN AVERMAETE, JURGEN	ATC Schiphol	NL	5
VAN DEN BERGE, NATHALIE	DBengineering	BE	4
WAGNER, JOHANNA MARIA	TU Berlin	DE	6
WOODWARD, TAMMY L.	Create Change Inc.	US	3
ZIJLSTRA, FRED R.H.	Maastricht University	NL	4

Membership class changes

NAZIR, SALMAN	Politecnico di Milano	I	Student → Colleague

– Membership 1991-2015:

HFES Europe Chapter Members
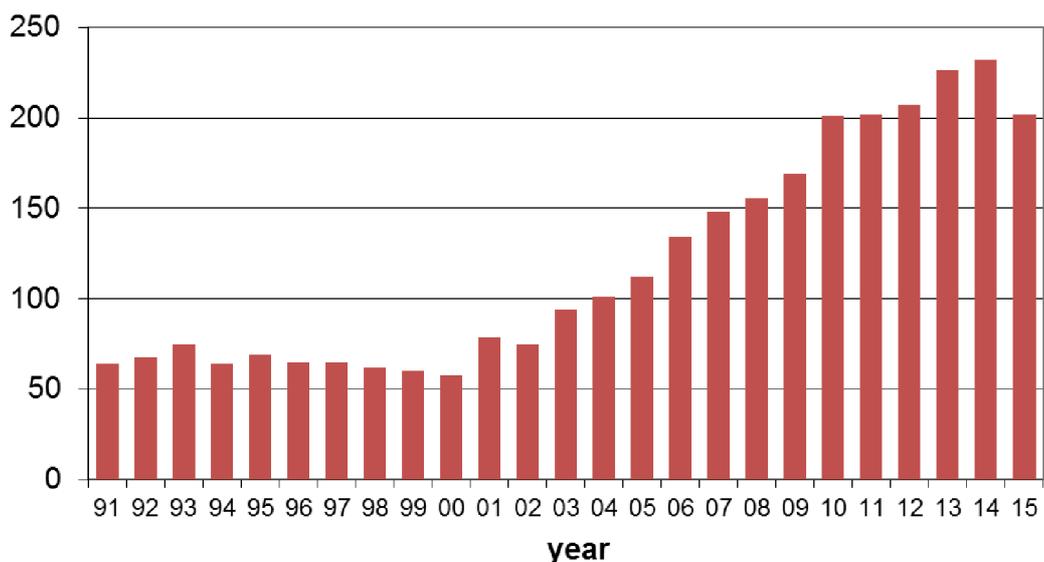
10. Programme Committee report, next meeting

- Editorial work on the proceedings, the division of labour. It was decided that (again) the Chair of a session will take care of papers submitted for that session.
- Next year's conference. It was decided to seek contact with Petr Boucher who offered to host the meeting in Prague. Petr is not a member, which makes a (January) visit crucial (Karel, Dick, & Antonella). We will send a short list on requirements, that Antonella will prepare, such as the need for a local professional organiser.
Somewhere in the next 5 years we can have the meeting in Berlin again (Dietrich). Francesco offered Rome as location.

11. Any other business

Antonella will keep us posted on a conference in Bari and what role we may play there.

VRC Grant Reports

Brain-Computer Interfacing at UCSD

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In the beginning of 2015, I took part in a two-month exchange program to the University of California, San Diego (UCSD), accompanied by three colleagues of mine from the department of Biological Psychology and Neuroergonomics at the Technical University of Berlin.

After receiving my B. Sc. degree in Human-Computer-Interaction from the University of Hamburg, I joined the Master's program in Human Factors at TU Berlin. There, I am also a member of the working group 'Team PhyPa' (Physiological Parameters for Adaptation) led by Dr. Thorsten O. Zander, which attends an exchange with UCSD on a yearly basis to exchange expertise and knowledge in the field of Brain-Computer-Interfaces (BCI). BCIs are interfaces which allow a direct interaction between the human brain and a computer or machine, where brain signals are usually measured by electroencephalography (EEG) systems. Characteristic patterns are extracted from the recorded signals, which then can be classified and afterwards used to operate a technical system. Applications exist for severely disabled people (for example patients with amyotrophic lateral sclerosis) who can use a BCI to communicate with the outside world or even control their wheelchair. But also the healthy population can benefit from a system that knows about their state of mind (workload level, relexation etc.) and can automatically adapt to it by providing a more suitable way of interaction with a system corresponding to a user's needs at a certain point of time.

After attending a BCI lecture held by Dr. Zander the semester before the exchange to UCSD, I got to work on a project during my stay in San Diego which focused on the methodological background of a new approach to connect the underlying mathematical results of a classification done by a BCI, to actual sources in correlated brain regions generating the signal measured and used by the BCI. This work included a lot of valuable tasks for me: I learned more about the connected software environment, such as MATLAB, EEGLab and BCILab (the latter both were developed at UCSD). Moreover, I gained insight to the steps of EEG data analysis and the concepts underlying them. At the end of my stay, I had prepared a presentation on the results from my analysis, which was presented to scientists at the Swartz Center for Computational Neuroscience (SCCN). I also learned how to visualize EEG data and gained knowledge on data collection and experimental planning through the experiments run at UCSD which I took part in as a participant. Through talks given and group meetings we attended, I gained a lot of insight to the work done at the SCCN and also at the de Sa Lab at the department for neuroscience.

Overall, the exchange to UCSD has been a wonderful experience for me, during which I improved and learned many skills for my scientific development, which will prove useful for my Master thesis on a BCI topic as well. Moreover, I have made many personal experiences through the people I met and talked to at UCSD, hopefully leading to future cooperation, and in the time spend living

with my three colleagues. Of course I have had many impressions of American culture and nature too, which have broadened my ken.

Cognitive Work Analysis for Heavy Goods Vehicle Driving in the Timber Haulage Industry

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Stas Krupenia

Earlier this year, funds were granted by the HFES Europe Chapter Grant Programme for a short-term research exchange between the Centre of Sustainable Road Freight at Heriot-Watt University in Edinburgh,UK and Scania AB in Södertälje, Sweden. The funding granted by the HFES Europe Chapter enabled international travel to perform research aimed to take an innovative approach to timber vehicle design by the application and development of a set of methods called Cognitive Work Analysis. Driver interviews performed by the visiting PhD student and assisted by the cognitive ergonomics team at Scania AB enabled the team to capture deep insights into the training, learning, and operational practices of timber drivers with over 300 years of combined experience. In fact, this visit has become the foundation of a true exchange, with members of Scania AB later visiting the United Kingdom for further driver interviews and international collaboration.

Phase I of the work involved building a picture of drivers' work systems by constructing a Work Domain Analysis. The main focus of this was an Abstraction Hierarchy, which modelled the functionality of a 'whole' rather than individually designed parts in isolation, as can easily become the case within large organisations consisting of many departments. Not only did this serve as a foundation for subsequent work phases, but this also fostered some productive discussions regarding the value of using abstraction hierarchies as strategic design maps for large organisations.

With a fuller understanding of the flexibilities and constraints of the work system, Phase II was begun with theoretical discussions of a prioritisation method for the second stage: Control Task Analysis. The goal was to develop a means of prioritising which types of activities should be focused on first to most effectively design a work system, under tight industry time constraints. Rather than focus exclusively on high-frequency situations, the team discussed the value of considering rarely occurring (low-frequency) situations, as well as the drivers' own ratings of effort required for each situation. Also considered were the drivers' own ratings of the importance of safety and efficiency for each function. These discussions led to the completion of exploratory driver interviews, analyses, and a comparison of the discussed factors of three prioritisation methods. Ultimately, the high-effort low-frequency events and high-effort high-frequency situations were selected. From these, the functions with the highest-rated impact on safety and efficiency were selected. The intersection of these prioritised functions and situations presented the activities

suggested as high priority for consideration in future work system design, namely:

− driving the vehicle gently, safely and efficiently on slippery terrain (such as mud or ice),
− performing precision manoeuvres at timber pick-up points, and
− encountering another vehicle suddenly driving closely to the front of the timber vehicle.

Work Phase III involved a preliminary Strategies Analysis. This stage classified and described strategy types in greater detail to gain an in-depth understanding of timber drivers' ways of working, which supported the development of more specific design features in timber vehicles.

After demonstrating the value of this work in industry, our hope is that this research to develop more effective timber vehicles may now be translated into academic publication(s).

Melissa Bedinger is a PhD Student at the Centre for Sustainable Road Freight, Heriot-Watt University, Edinburgh. Stas Krupenia is Cognitive Engineer at Scania AB, Södertälje, Sweden.

Neural effects of aesthetic preference

Mara Milena Suter
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Background
I am a third year psychology student at the University of Fribourg and I recently got involved in a research project aiming to investigate human processing of icons and its influence on visual aesthetics. An international research network between the Department of Psychology Fribourg and Bournemouth University Electroencephalography (EEG) lab was formed to work on this and subsequent projects. This network brings together experts from the field of Human Factors and the field of neuroscience. The Europe Chapter Exchange Programme enabled me to go on a one month exchange at Bournemouth University during which I worked on an initial experiment using event-related potentials. As a bachelor student at the very beginning of a research career, the exchange was very exciting.

Research Rationale
As recent research suggests, the human visual system performs rapid implicit aesthetic/hedonic evaluations, that are obligatory and occur within latencies that place constraints on models that posit contributions from conscious decision making processes (Codispoti et al., 2006; Handy et al., 2008 & Olofsson et al., 2008).

The project aimed to investigate the connection between visual processing of icons and hedonic judgements about them. Event-related potentials have an excellent temporal resolution (in the order of milliseconds) and are time-locked to a presented stimulus. They can thus provide an 'online'

index for the neural processes following perception which enables to examine and contribute to theoretical models that characterise the temporal sequence of hedonic evaluations (and to clarify the relative involvement of implicit and explicit neural mechanisms in such mental operations).

Results
During my stay, I was able to contribute to the setup of the experimental design and procedure. Furthermore, I took over responsibilities concerning data collection and analysis. Our results have begun to provide clarification of questions related to the nature and time course of representations that underlie preference / liking events in the brain. We found ERPs revealing differences in brain activation that distinguished trials that presented icons later classified as liked and disliked. The earliest differences in ERPs began as an enhancement of the P2 component (an early ERP component normally elicited by visual stimuli) for liked icons compared with disliked. Largest differences in ERPs were revealed during latencies after 250ms as enhanced negative amplitudes for liked icons compared with disliked. In conclusion, our results suggest that hedonic evaluations of icons can be done implicitly and very rapidly. This is one of very few studies to date to show that this is the case and we know of none which have used icons typically used on interfaces as stimuli.

Future work
As promising our results are so far, the question about how implicit hedonic evalutions are formed remains open. We are now analysing our ERPs for those icons consistently picked across participants as liked or disliked. This allows us to investigate whether there might be intrinsic features of icons (i. e. symmetry) that could explain early preference effects. Additonally, we are deriving ERPs on the basis of normative data collected for familiarity and visual complexity to see whether these factors interact with preference. We are furthermore investigating the effects of repetition as during our experimental procedure, each icon was presented 8 times to each participant. The P3 ERP component is sensitive to ease of memory encoding and retrieval. It may be that the earlier onset of the component for disliked icons reflects the ease with which they are encoded on initial and subsequent presentations. By deriving ERPs to liked and disliked icons for early and late presentations it will be possible to assess whether memory encoding is biased for disliked icons.

For me personally, the stay at Bournemouth University was very enriching. Not only did I get the chance to be part of a research project from the very beginning. I also learned how to perform an entire EEG testing procedure and how to analyze ERPs using Brain Vision Analyzer. I am sure that these skills will be of great use in my studies and further research.

Mara Milena Suter is currently pursuing her Bachelor studies in Psychology and Neurosciences at the University of Fribourg.

References

Codispoti M., Ferrari V., Junghofer M. & Schupp H. T. (2006). The categorization of natural scenes: brain attention networks revealed by dense sensor ERPs. *Neuroimage, 32,* 583–591.

Handy, T. C., Smilek, D., Geiger, L., Liu, C. & Schooler, J. W. (2008). ERP Evidence for Rapid Hedonic Evaluation of Logos. *Journal of Cognitive Neuroscience, 22* (1), 124-138.

Olofsson J.K. & Polich J. (2007) Affective visual event-related potentials: arousal, repetition, and time-on-task. *Biological Psychology, 75,* 101–108.

Book Reviews

Reviewed by Nektarios Karanikas
nektkar@gmail.com
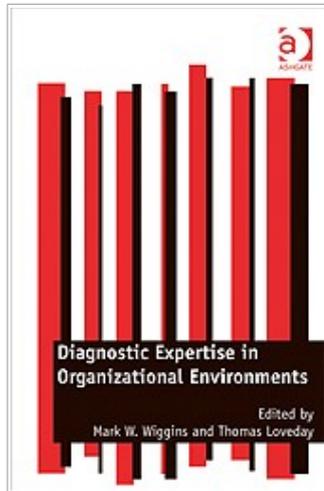
Diagnostic Expertise in Organizational Environments
Edited by Mark W. Wiggins and Thomas Loveday
2015, 226 pages, £60 (hardback)
Farnham, UK: Ashgate
ISBN: 978-1-4724-3517-0

Although there have been various empirical studies, diagnostic expertise in the operational field is still approached in a pragmatic way. The book edited by Wiggins and Thomas bridges theory and practice; the authors present in a comprehensive manner theoretical concepts and the applicability of the latter in real world cases. Throughout the book the reader is introduced to the fundamentals of diagnostic expertise and exposed to examples in a variety of sectors, where expertise plays a paramount role in effective decision-making and achievement of strategic organizational goals.

The 1st chapter sets the ground for understanding what diagnostic expertise is and discusses the importance and development of cue-event associations in complex environments, the context-depended nature of expertise, and the effects of heuristics and cognitive resources limitations. Focusing on situational awareness (SA), the next chapter addresses quality issues of cues, the prevalence of traditional views on SA, the lack of ecological validity in relevant studies, and our temptation to see SA as a causal factor of wrong decisions instead of an adaptive capacity of humans.

Chapter 3 emphasizes on communication as a principal source of cues when cooperation and coordination amongst operators is present. Through the aircraft flying paradigm the authors convincingly articulate the problems associated with ineffective communication, especially the ones related to linguistics (e.g., communication protocols, interpretation of prosodic cues, non-native languages spoken under various accents and rates, and unavailability of non-verbal cues during remote communication). Starting from the importance of appropriate cue perception and diagnosis for the survival of all living species and an introduction to the functions of attention, the 4th chapter discusses the concept of vigilance and suggests an alternative explanation of boredom. The authors articulate the views that boredom is a regulatory mechanism of the brain that reliefs itself from continuous high demands when searching for salient cues in monotonic operational environments.

The challenges of remote and centralized control of operations where staff is supported by technology but lack a direct contact with the operational field are presented in Chapter 5, accompanied by design strategies that can facilitate the development of diagnostic expertise for novice employees. The

advantages and drawbacks of choosing between static or dynamic, integrated or discrete, and abstract or iconic features, and information- or cause-oriented indicators are in detail argued. The authors of the 6th chapter point the effects of mood in decision-making and place expertise in its social context. Under the concept of naturalistic decision-making, positive and negative emotions might drive correspondingly a top-down or bottom-up information processing, the former being highly subject to heuristics and potentially leading to misjudgements.

In Chapter 7 the challenges in training for diagnosis are explored. Following the explanation of three cue-based learning methodologies, the author notices that changing operators' mental models is difficult to achieve, and careful design of training and consideration of context are necessary. Involvement in operational tasks, exposure to various combinations of real-world cues, consideration of effects of heuristics, intuition and level of experience compose the mosaic of cue-based training requirements. Expertise in medicine is the topic of the 8th chapter, where the authors discuss interesting contributing factors, such as the differences between tacit and explicit knowledge of health practitioners, introduction of new technology as means to augment environmental cues, communication difficulties across teams and professional groups, organizational influences and increased task complexity.

Continuing the presentation of real-world examples of diagnostic expertise, Chapter 9 regards major crimes investigation and points the plethora of available cues in the crime scene, and the demand to appropriately select and timely process those cues. The need for respective training of novice investigators is recognized and the use of decision support systems is suggested. Finance comprises the area addressed in the 10th chapter, where the authors distinguish between off-task and on-task cues, the former often taking priority over the latter during decision making and regularly leading to misalignments between organizational expectations and activities at the frontline. Through examples from finance related tasks, the reader's awareness is raised about the influences of norms, cultures and values when experts balance amongst individual, team and organizational goals.

Chapter 11 suggests the consideration of diagnostic support systems, especially when operators might become overwhelmed due to numerous salient cues under time constraints. Following the description of an aviation accident case, the author discusses the differences in diagnostic capacity between experienced and inexperienced employees, and proposes strategies to deal with high cognitive loads of novice operators, such strategies being possibly supported via technology. An empirical study about the paramount role of communication in collective diagnosis of cues in safety critical environments is presented in Chapter 12. The results of this study showed effects of "can do", masculinity and "professionals do not need help" cultures, over self-confidence, communication styles and types of leadership on collective diagnosis. The last chapter presents the paradigm of operations control center (OCC) in aviation; the author presents the complexity of modern air operations and the tight interconnectivity amongst OCC staff and agents that support flights. In such an intensive environment expertise is required to confront with unanticipated disruptions when time is limited and high financial losses might occur.

Concluding this review, the efforts of all authors to achieve comprehensiveness of their work and successfully balance between academic

and professional language must be highlighted. Another strength of the book is that although all chapters are more or less linked, the authors present their topic in an inclusive manner and, therefore, each chapter can be read separately. A highly recommended book for human factors theorists and practitioners as well industry professionals.

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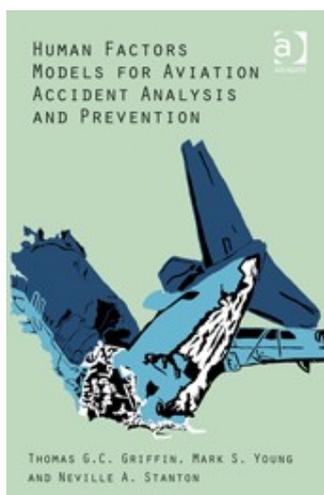
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by Thomas G.C. Griffin, Mark S. Young and Neville A. Stanton
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In the review in the beginning of the book, the authors are complimented with their new approach to analysing human factors in aviation. They state to leave linear risk models behind and extend their analysis to systemic accident and incident investigations. They aim at a better understanding and investigating the complex world of aviation accidents and safety by the use of information networks to support improved risk mitigation. This raises high expectations on the novelty of their approach

In Chapter 1, the authors apply a reference frame, based on the human error definition of James Reason, focusing on the trade-off between safety and productivity. The goal is to increase the performance where successful protection is indicated by the absence of negative outcomes. Since technology is assumed to be highly reliable, they focus on the human factor, acknowledging the weak link between safety and productivity.

Based on their two year research project, the authors raise three principal questions:

- To move away from the linear models that currently dominate aviation risk investigation and reduction to deal with dynamic and complex systems
- Incorporate general aviation and commercial aviation alike, facilitating an equal usability in any method of the sometimes very different issues which underlies these aviation types
- Addressing the question whether there is a fundamental difference between accidents and incidents.

In Chapter 2, an encompassing oversight is provided of the human performance literature on accident causation, criticizing the Domino theory, Iceberg principle, Swiss Cheese model and the multitude of their derivatives and rebirths, such as the Tripod method. These models have lead to accident classification systems with inherent limitations, such as HFACS.

The authors identify a completely new perspective in accident analysis, referring to the work of Benner (1975) on the STEP method (Sequentially Timed and Events Plotting) as a first attempt to incorporate the dynamics and adaptive capacity of complex systems. They intent to expand this concept to the network level incorporating multiple factors, actors and aspects. In addressing human reliability, they move towards quantitative methods in order to limit subjectivity of substance matter experts. A next step should abandon analysing single events in favour of a systems analysis at the network level in its operational context. Further quantification should enable development of probability relationships, introducing increased granularity and objectivity. To provide sufficient quantities of data to substantiate the network model, incidents and historical data of normal and abnormal operations should be included in the data collection to compensate falling accident numbers. The authors notice a need for proactive error prediction technique with reference to common causes in accident and incident situations. The more knowledge of previous events is available, the more comparisons may be correct in identifying similarities between accidents and incidents.

In chapter 3, a central role is allocated for dynamic interactions between agents and communication in optimizing complex systems. The authors apply their EAST (Event Analysis of Systemic Teamwork) approach to accident analysis in order to examine information flows across networks. EAST facilitates the building of an 'as is' representation of the situation. Such an approach facilitates the creation of a holistic understanding and removes the dependency on a timeline approach. Based on the Aviation Accident Investigation Board (AAIB) report on the Kegworth air crash in 1989, such a network facilitates highlights which aspects of communication were available for key agents at the right times. This approach enables identification of design failures and requirements for further investigation in assessing management of the situation and allows for easier identification and interpretation of risk factors for systems breakdown.

In Chapter 4, the authors elaborate on their development of a complex network approach, in which common failure can be seen as the basis for all accidents and incidents. They elaborate on the concept of team situational awareness and clarify the information space for decision making and interaction. Instead of avoiding the sharp end in favour of an upper-echelon

focus, the approach re-evaluates the potential of fully investigating the active factors by dissecting the situation without addressing the question of blame. The method stays on the sharp end, but focuses on the team level and facilitates feedback to the design phase. The method applies data mining which should facilitate distance to the source, node importance and centrality of nodes, agent based node ownership and sociometric status while creating an 'ideal' network configuration. Such an information network adds to the analytic tools in adding a graphic tool which should be combined with appropriate metrics. In selecting such metrics, a focus on conventional causal factor classification or outcomes of event by event investigations should be replaced by a systemic focus.

In chapter 5, to this purpose, the authors combine the network model with Bayesian mathematics. Such an approach requires more data, should facilitate automated processing and mobilizing other sources of information, such as simulation studies. The goal of such a approach is to remove the limits of reproducibility and to encompass varied small changes in the barriers that prohibit exchange of information across nodes in the network. Barriers are considered the constant in this approach and form the basis for analysing the flow of information in the method. The approach should be suitable to the general aviation sector and commercial aviation alike, regardless of outcomes, varying from small incidents to catastrophic events and removing the subjectivity of substance matter experts.

In building the network, 200 general aviation accidents published by AAIB were studied and MATLAB was used to code the Bayesian network that was developed. The authors expect that once positive outcome data are included, it would be clearer which barriers could result in the migration of probability towards more positive results. Such barrier identification could result in scrutinizing the link in the network with its associated properties and how it can be affected by training, regulation or other mitigating measures. Such scrutiny should provide proactive modelling taking into account the extent and quality of current historical data.

In chapter 6, the authors conduct a simulator experiment with 36 experienced pilots in the general aviation simulator of the Brunel University on overrun events and hard landings. These experiments provided the raw data for the validation of the predictive nature of probability mitigation. The results indicate that barrier insertion and possible migration of information in a network might allow an investigator to identify relationships that are not apparent on a high-level analysis or are obscured by a linear chain causal representation. A potential of extrapolation in larger networks may identify all possible migration routes of information, given the insertion of a barrier and eventually, may fully predict outcomes. A further expansion of the approach in linking scenarios to the entire flight system would require a larger research setup and resources, including positive flight data, encompassing full 3D networks for a particular flight phase, but seems to have great potential.

In chapter 7, the authors elaborate on the relation between accidents and incidents. The conversion from safety data related information into risk assessment for managerial purposes moves away from a skewed effect of frequency of consequences in terms of risk ranking. The LOPA approach (Layers of Protection Analysis) is a semi-quantitative risk assessment method, providing the theoretical background for assessing whether safeguards are

adequate, including less quantifiable human factors. It should illustrate how event descriptors link to possible outcomes. In the quantification of barriers, a 'distance from disaster' approach should have usability and reduction of complexity at its core, creating a basis for a new risk rating system. However, to move forward in manageable steps, simplification was applied with respect to standard incidents and restricted data inputs. Such input can be expanded in the future to air safety reports and regular positive feedback. Three phases were developed by drawing the network, identification of barriers and scoring of risk by non-experts as 'risk raters'. Reflecting on the severity of an incident allows a company to report and concentrate on the incidents that cause the most serious problems.

Eventually this process could be fully automated and replace current methods of risk rating and the use of event sequence diagrams. Based on a solid model and a central bank of standard incidents, this method represent safety within the entire complex system, but is simplified enough to be practical useful without restrictive amounts of training. Risk raters are encouraged to understand more fully the scenario and look beyond the negative aspects. There is no longer a need to specify events. Instead, all events are simply events where certain nodes / factors / information are activated in their situation by their interaction with barriers and their strengths and weaknesses. Incidents almost become a by-product in the system. The approach has introduced an actual risk-rating method, different from those seen in literature and more similar to an accident or system investigation tool. It exceeds current best practices found through literature review. It removes a large amount of subjectivity, standardises risk-rating company wide and removes the frequency bias that limits the usefulness of current data. It highlights a knowledge retention and increases the granularity of incidents.

In the final conclusive chapter, the authors state that their 3D model ultimately can reflect more fully the real world accident system information space that is so often misrepresented in current models. Through iterative processes and quantification, predictions can be made as a basis for a full cost-benefit analysis type of approach. The authors are convinced, based on their passion with aviation safety, that by a further exploration of the approach, the real benefits of a data-harvesting, self-populating 3-dimensional system safety model will increase.

In conclusion

The authors of the book introduce a new approach to risk rating and mitigation. They express high aspirations and expectations in overcoming several limitations in current safety investigations and risk assessment approaches. New approaches are relatively rare and not easily accepted in vested circles of safety management and risk assessment. They carefully phrase their approach as complimentary to existing theories and practices. In an attempt to cover systemic dynamics and complexity, they make interesting combinations of the STEP approach of Benner -whos investigative perspective was already postulated in the 1970's- with recent network theory and Bayesian mathematics. In addition, they make a clear distinction between events and the systemic environment in which these events occur. Such an analytical distinction is rarely recognized in the academic literature. Although their approach can be criticized

for practical applicability due to the state of its development, there are more methodologically based hesitations to their approach.

First of all, the authors adhere to James Reason's barrier and error theory, which is fundamentally a mechanical and energetic concept. It is disputable whether this barrier and energetic concept can be applied in information network applications, in particular when a systemic analysis is performed in a multi actor environment beyond the corporate level.

Secondly, the issue of modelling complexity has difficulties in applying stop rules to the extent and scalability of modelling as such. To quote professor Patrick Hudson in his advocating of the Causal Model for Air Transport Safety model of aviation safety: *CATS is the second best representation of reality, reality itself being the best.* In contrast, major accident investigations reject a prospective modelling of the aviation system, referring to Mr. Arslanian as the former chairman of the Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (BEA) in defining serendipity as: *disclosing by accident relations and interactions that have been unprecedented.* He stated*: Safety investigations are a reality check since preceding modelling, simulation and systemic decomposition during design, development, testing and certification all have their assumptions and limitations. It is necessary to make capital out of experience, to get feedback from the unpredictable, to learn what we encounter in the field.*

Finally, relying on feedback from normal operations might create the pitfall of confirmation bias, in particular where a frequency of 10^{-7} accident rate is accounted for in commercial aviation. Risk rating can only be complimentary for accident investigation into single case events, which is providing evidence on a case based level and exploring knowledge deficiencies. Safety investigations are the problem providers for knowledge development.

This is a challenging and promising book, breaking away from traditional perspectives that have dominated the academic debate for about 30 years, in particular with respect to human performance, decision making and communication on a team level. It also deserves reading with a critical eye.

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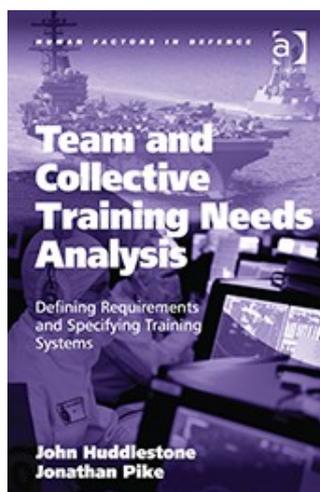
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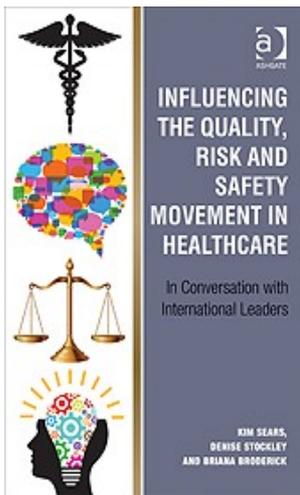Farnham, UK: Ashgate
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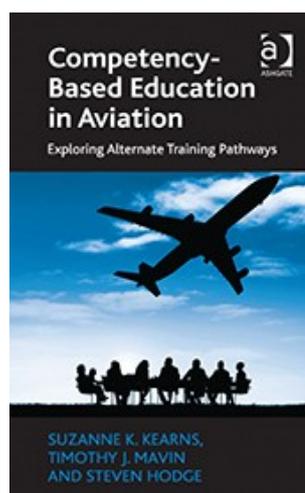
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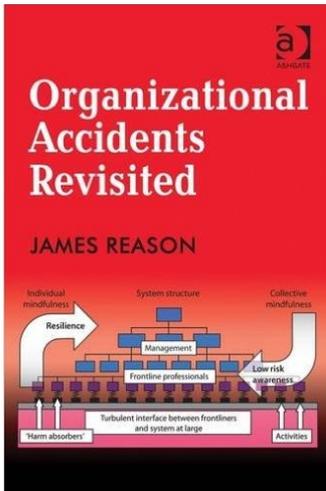
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