



Institute of
Ergonomics &
Human Factors

Ergonomics & Human Factors 2011

12-14 April 2011

Stoke Rochford, Lincolnshire

Conference Programme

Welcome



On behalf of the Conference Committee, I would like to welcome you to Ergonomics and Human Factors 2011, in the magnificent setting of Stoke Rochford Hall. This event is the annual conference of the Institute of Ergonomics & Human Factors.

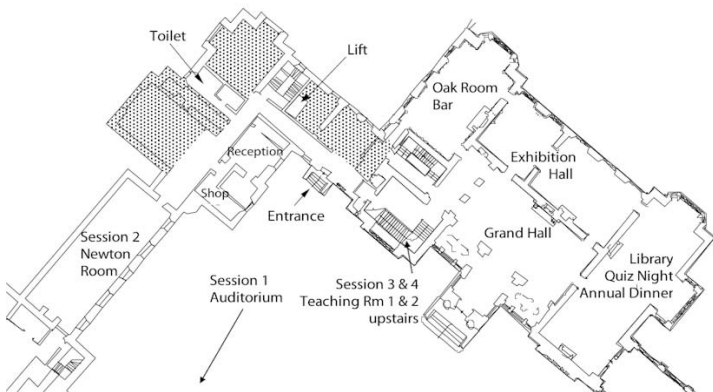
A warm welcome is extended to all our delegates from overseas. I'd also like to welcome back regular attendees and members of the Institute. I hope that non-members will visit the membership exhibition stand to discuss the benefits of joining the Institute.

This year we are trialling a new format for this conference programme and we would be pleased to receive any feedback on this layout. And as you will see from the programme we have contributions across a broad range of ergonomics and human factors topics. In addition to the plenary lectures, I'd particularly like to draw your attention to the various workshops, and the debate on Wednesday afternoon. However, it's not all work! There's plenty of time to relax and network informally. I'm sure you'll enjoy the legendary conference quiz on Tuesday evening and the Annual Dinner on Wednesday.

If any member of the conference team can make your visit more enjoyable, please let us know; the Conference Secretariat are easily identifiable by their red badges. Finally, I'd like to wish all presenters, delegates, exhibitors and sponsors a successful and enjoyable conference.

Martin Anderson

Editor, Contemporary Ergonomics and Human Factors 2011



The venue

Originally built in the 1840s as a private residence, Stoke Rochford Hall is a magnificent Grade 1 listed Victorian mansion. It was recently restored to its former glory following a devastating fire on 25 January 2005. Specialist craftsmen from across the country restored and replaced ornate ceilings and fireplaces.

Meals & refreshments

Breakfast will be served in the lower floor Reflections restaurant from 07.30 to 09.00. Lunch will be served in the Grand Hall from 12.30 to 14.00, but please refer to the programme for lunch break times.

Tea and coffee will be served during breaks in the Exhibitor Hall (Turnor and Rochford Rooms). Please refer to the programme for the time of the breaks. The Reflections restaurant will be serving evening meals from 18.00 to 19.30 on Monday and Tuesday if you have booked accommodation.

Social events

The Annual Dinner on Wednesday will be held in the Library and the dress code is formal evening wear. A drinks reception will be held immediately before the dinner from 19.00 to 20.00 in the Grand Hall. After dinner, an informal late night party will be held in the Oak Room bar off the Grand Hall.

Facilities

There are no shops at Stoke Rochford Hall but there are items for sale at reception, including some toiletries, confectionary and drinks. A small selection of newspapers is available from reception each morning. If you have a request, you can place an order at reception the previous day. A cashback service, with a debit card, is available at reception from 07.30 to 22.00. Cheques, accompanied by a bank card, may be changed at the Finance Office until 17.00 and after, in the Terrace Bar. There is a £1 handling charge for these facilities. The nearest banks are in Grantham.

Internet access

Wifi internet access is available throughout the Grand Hall and session rooms. There is no code required. In the accommodation areas you will need an ethernet cable for access.

09.30 Opening remarks by John Wilson, IEHF President

09.35 **Donald Broadbent Lecture:**
Plenary Lecture
“The human component of military capability: the key to enabling technology” by Sylvia Horner



The human contribution to system design is an essential component in UK defence systems. Whilst technology and automation, decision aids and computer processing all play essential parts in achieving the necessary levels of system performance, human actions can't be totally removed from the processes. With a little analysis and forethought, the expectations and capabilities of operators and maintainers can be captured at an early stage and embodied in the hardware and software. Human error is designed out, training and help functions are built in, the equipment works well in the environment for which it is designed, and tasks can be undertaken by people they are designed for.

Session 1 **Transport**

Chair: Mark Young

10.15 An investigation of the perception of transport problems and the role of electric buses. Prof Andree Woodcock, Coventry University, UK

10.45 Break in the Exhibition Hall

11.15 Human factors issues in railway intelligent infrastructure systems. Nastaran Dadashi, University of Nottingham, UK

11.45 Exploring the IVIS usability challenge: an experimental evaluation of two in-vehicle information system input devices. Catherine Harvey, University of Southampton, UK

12.15 Effects of a mid-morning cereal bar on hazard perception in driving. Prof Andrew Smith, Cardiff University, UK

12.45 Lunch in the Grand Hall

* no paper in proceedings

Tuesday morning, 12th April

Newton Room

Session 2 **User centred design**

Chair: Sarah Sharples

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- 10.15** User research in medical device development. Dr Julie Barnett, Brunel University, UK
-
- 10.45** Break in the Exhibition Hall
-
- 11.15** Self management of Type II diabetes: the role of blood glucose monitoring. Dr Jennifer Martin, University of Nottingham, UK
-
- 11.45** Incorporation of carer and patient needs in the development of assistive technology for people with dementia. Dr Sonja O'Neill, University of Ulster, UK
-
- 12.15** Development of a tool to support method selection in medical device user needs elicitation and evaluation. Dr David Morris, University of Nottingham, UK
-
- 12.45** Lunch in the Grand Hall
-

Tuesday morning, 12th April

Teaching Room 1

Session 3 **Making safety culture work**

Chair: Aoife Finneran

-
- 10.15** Safety culture survey: Pan-European perspective. Andrew Kilner, Eurocontrol, France
-
- 10.45** Break in the Exhibition Hall
-
- 11.15** Developing a safety culture questionnaire for European Air Traffic management: learning from experience. Dr Steve Shorrock, Eurocontrol, France
-
- 11.45** Safety culture survey: the customer perspective. Andrew Kilner, Eurocontrol, France
-
- 12.15** Safe behaviour and safety culture on the railway. Rachel Bend, University of Nottingham, UK
-
- 12.45** Lunch in the Grand Hall
-

Session 4 **Military**

Chair: Anthony Masys

10.15 Mind the gap: building bridges between analysis and design with Rich Pictures and SOCA-CAT. Prof Neville Stanton, University of Southampton, UK

10.45 Break in the Exhibition Hall

11.15 Manual control with time delays in an immersive virtual environment. Dr Richard So, HKSUT Hong Kong

11.45 Measuring team SA: where have we been and where are we heading? Linda Sorensen, University of Southampton, UK

12.15 Human factors integration and systems engineering, a model-based approach. Kerry Tatlock, MBDA (UK)

12.45 Lunch in the Grand Hall

Notes

13.45 “Validating a driving simulator for police driver training” by Lisa Dorn, Cranfield UniversityPlenary
Lecture

There has been an alarming rise in the number of fatalities and serious accidents involving police drivers, particularly during pursuit situations. Intensive police driver training offers little opportunity for developing driving competencies in high risk situations. There is a potential role for the use of a driving simulator for police drivers to supplement existing training methods without exposing police officers or the public to danger, yet there is little research on whether this method is beneficial. This talk describes the design and validation of a driving simulator for South Wales Police.

Session 1 **Transport**

Chair: Ruth Sims

14.30 Task pre-loading: designing adaptive systems to counteract mental underload. Dr Mark Young, Brunel University, UK**15.00** Automotive ergonomics at 50: where do we stand? Dr Nick Gkikas, Autonomics UK**15.30** Break in the Exhibition Hall

Chair: Andree Woodcock

16.00 Tactile detection task as a real time cognitive workload measure. Dr Cyriel Diels, TRL, UK**16.30** Activity interference during exposure to whole-body vibration: seated and standing individuals. William Baker, Loughborough University, UK**17.00** Experimental evaluation of touch screen interaction for in-car applications. Michael Krause, Technische University Munchen, Germany
(end 17.30)

Session 2 User centred design

Chair: Sarah Sharples

14.30 Motivation and attitudes of users of Adrenalin Auto-Injectors. Dr Arthur Money, University of Bedfordshire, UK***15.00** Patients (patience) in research. The challenges of interviewing adolescent medical device users in hospital clinics. Alexandra Lang, University of Nottingham, UK**15.30** Break in the Exhibition Hall**Session 2 Manufacturing**

Chair: Ed Chandler

16.00 An ergonomic performance prediction model (Ergo Pro-Predict). Dr Aoife Finneran, Loughborough University, UK**16.30** Analysing s/n ratio optimisation of physiological stress of Indian male workers in summer and winter during manual lifting tasks. Ajay Batish, Thapar University, India
(end 17.00)

Quiz Night

On Tuesday 12th April at 19.45 in the Library, the annual Quiz Night will take place. This evening is usually one of the highlights of the conference and not to be missed. So after dinner, get a drink from the bar, get in a team and join in the fun. Don't worry if you're at the conference on your own, come along and join a team. It's a great way to meet people without having to talk ergonomics!

We are grateful, as ever, to Taylor & Francis for sponsoring the quiz night, and the real ale. The venue's own bar will be open afterwards until midnight.

This year the quiz is called "Have I Got News For You". You could guess what it's about. Hopefully, the high-tech wizardry will delight and astound you. There will be a chance to show off your practical skills too...

Tuesday afternoon, 12th April

Teaching Room 2

Session 4 **Military**

Chair: Gerry Newell

14.30 Structuring the analysis of human concerns at an early stage of system development. Dr Andrew Belyavin, QinetiQ Ltd, UK
(end 15.00)

15.30 Break in the Exhibition Hall

Session 4 **Safety**

Chair: Phil Bust

16.00 Managing risk in construction - getting the balance right. Stuart Shirreff, KDC Contractors Ltd, UK

16.30 Practical application of competence management systems in safety-critical industries. Nina Powell, Human Engineering Ltd UK

17.00 Effects of simultaneous whole-body vibration and trunk rotation on off-road driving tasks. Lauren Morgan, Loughborough University, UK
(end 17.30)

Tuesday evening, 12th April

17.30 Poster session and drinks reception in the Grand Hall



- ◆ Feasibility of using Radio Frequency Identification Tags (RFID) for tracking patient and staff activity in healthcare. Neil Mansfield, Loughborough University, UK
- ◆ Raising the standard: London Underground human factors. Jon Wackrow, London Underground, UK
- ◆ Ergonomics for systems of systems: the challenge of the 21st century. Huseyin Dogan, Loughborough University, UK
- ◆ Assessment of the benefits of adjustable task lighting in office environments. Tamara James, Duke Univ & Health Systems, USA
- ◆ Human reliability analysis for steam generator feed-and-bleed accidents in a typical VVER power plant. Mohammad Yousefi, Atomic Energy Organization, Iran

18.30 Dinner in Reflections restaurant

19.45 "Have I Got News For You" quiz night in the Library



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09.00 “Enhancing quality of life - a people-centred approach to innovation” by **Patrick Jordan**
Plenary Lecture

The most valuable innovations are products and services which are useful and usable and which significantly enhance people’s quality of life. The various dimensions of quality of life include economic factors, as well as issues associated with health, relationships and social cohesion. We will look at various areas in which innovation is moving rapidly, assessing recent developments in each area and possible future directions. A framework will be outlined by which quality of life can be assessed.

Session 1 Manufacturing

Chair: Mike Gray

09.45 Ergonomic evaluation of dynamic muscular strains for the simulation in digital human models. Christian Hentschel, Chemnitz University of Technology, Germany**10.15** Making judgements about upper limb disorders. Dr Claire Williams, Derby University, UK**10.45** Break in the Exhibition Hall**Session 1 Cross sector**

Chair: Tom Stewart

11.15 Co-morbid musculoskeletal complaints - how common are they and what impact do they have? Andrew Baird, Derby University, UK**11.45** Older people’s experiences of their kitchens: dishes and wishes. Dr Ruth Sims, Loughborough Design School, UK**12.15** The use of biometric fingerprint technology with the over 65s: a case study. Dr Phil Day, NCR, UK**12.45** Lunch in the Grand Hall

Session 2 Healthcare

Chair: Sian Taylor-Phillips

- 09.45** What is Human Factors Expertise? Findings from an error identification and explanation task. Dr Ken Catchpole, University of Oxford, UK*
- 10.15** NHS at home: a co-design research project to develop a 21st century nursing bag. David Swann, Royal College of Art, UK

10.45 Break in the Exhibition Hall

Session 2 Chair: Peter Buckle

- 11.15** Ergonomics design of workplaces – prevention for all generations. Dr Hanna Zieschang, German Social Accident Insurance, DGUV Germany
- 11.45** Are home use medical devices easy to use? Abdusselam Cifter, Brunel University, UK
- 12.15** Risk factors for the development of adolescent low back pain: a literature review. Dr Steve Milanese, University of South Australia
- 12.45** Lunch in the Grand Hall

Exhibitors

The conference includes an exhibition of the latest products and services available to practising ergonomists and their clients. The exhibition is an essential part of the conference, and we are grateful for the support of our exhibitors.



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Session 3 **IEHF**

09.45 Updates from the IEHF: membership, CPD and Chartership.

10.45 Break in the Exhibition Hall

Session 3 **Accidents**

Chair: Neville Stanton

11.15 Human factors in the design and deployment of proximity detection systems for mobile mining equipment. Tristan Cooke, University of Queensland, Australia

11.45 From human error to the hybrid collectif: exploring complex socio-technical systems. Dr Anthony Masys, Defence Research & Development, Canada

12.15 The use of the critical decision method to elicit schematic processing in the cockpit: a pilot study. Katherine Plant, University of Southampton, UK

12.45 Lunch in the Grand Hall

Exhibitors



Session 4 Cross sector

Chair: Dave Moore

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- 09.45** The different human factors requirements of boundaried and non-boundaried working contexts in high reliability organisations. Harry Blanchard, Human Engineering Ltd, UK
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- 10.15** Working here, there and everywhere: challenges for researchers and employees involved in remote and mobile working. Dr Joanne Crawford, Institute of Occupational Medicine, UK
-
- 10.45** Break in the Exhibition Hall
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Session 4 HFI

Chair: Huseyin Dogan

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- 11.15** Developing a task analysis methodology to inform the design of work and the environment for a large broadcasting organisation in the UK. Kate Fairhall, Ove Arup and Partners, UK*
-
- 11.45** Practical Human Factors Integration. W Ian Hamilton, Human Engineering Ltd, UK
-
- 12.15** Workshop: Practical Human Factors Integration
-
- 12.45** Lunch in the Grand Hall
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Notes

13.45Plenary
Lecture

Institute Lecture: “Can we design effective sociotechnical systems? Exploring the gap between systems design and systems in action”
by **Professor Ken Eason**



I will present examples of the ‘workarounds’ that NHS staff develop to cope with differences between what their technical systems provide and what the reality of the tasks they have to perform demand. I will then look at the design process to ask why we did not identify these problems. Whatever design method we use we cannot predict all of the emergent demands: designers cannot know in advance the ‘requisite variety’ that their systems will require. How then can we design effective sociotechnical systems?

14.15 Awards ceremonySession 1 **Future computer use**

Chair: Phil Day

14.40 Who needs an iPad? Tom Stewart, System Concepts, UK***15.10** Visually induced motion sickness effects of translational visual motion along different axes. Dr Richard So, HKSUT Hong Kong**15.40** Break in the Exhibition Hall**Debate****16.10** Ergonomics for systems of systems: the challenge of the 21st Century. Prof Michael Henshaw, Loughborough University, UK
(end 17.40)

IEHF Membership

If you have any questions about membership, perhaps about upgrading to Registered Membership, or would like to find out about the benefits of becoming a member, come along to the IEHF membership stand where we’ll be on hand to help. We have advice to give and details to take away, or you could just come and have a chat.

Wednesday afternoon, 13th April Teaching Room 1

Session 3 **Manufacturing**

Chair: Wendy Morris

- 14.40** Workshop
Automotive manufacturing: assembly ergonomics in the 21st century. Wendy Morris, Jaguar Land Rover, UK

- 15.40** Break in the Exhibition Hall

Session 3 **The 24 hour society**

Chair: Tom Stewart

- 16.10** Working hours and vigilance in breast cancer screening. Dr Sian Taylor-Phillips, Warwick Medical School, UK

- 16.40** A systematic review of the effectiveness of ergonomic interventions in call centres. Christine Sprigg, University of Sheffield, UK

- 17.10** Using video to disseminate research on seafarers' fatigue. Paul
(end 17.40) Allen, Cardiff University, UK

Wednesday afternoon, 13th April Teaching Room 2

Session 4 **HFI**

Chair: Peter Wilkinson

- 14.40** Panel discussion on HFI
Strengths, weaknesses and moving forward. MoD Industry HFI Working Group*

- 15.40** Break in the Exhibition Hall

Wednesday evening, 13th April

- 19.15** Drinks Reception
in the Grand Hall

 towergate professional risks

- 20.00** Annual Dinner in the Library followed
by the After Dinner Drinks Party in the
Oak Room Bar.

 Hu-Tech
ergonomics
human factors

Session 1 **Maps**

Chair: Michael Brown

09.30 The application of innovative AutoCad based tools to position safety signs and aid wayfinding in complex environments. Dr Aoife Finneran, Loughborough University, UK

10.00 Workshop
When maps go bad: exploring the interaction between software and data usability. Dr Michael Brown, Ordnance Survey, UK

11.00 Break in the Exhibition Hall

11.30 “Enabled by Design: The who, what and why” by Denise Stephens

Plenary
Lecture

Enabled by Design (EbD) is a community of people who are passionate about well designed products and services, that can help to make everyday living that little bit easier and support people to live as independently as possible. EbD was inspired by my experiences following diagnosis of relapsing remitting multiple sclerosis (MS) in 2003. As I became more dependent on assistive equipment, my world was slowly but surely transformed into an uninspirational palette of ‘NHS’ grey and beige. Frustrated by the current one-size-fits-all ethos and wanting to make an immediate difference to other people’s lives, I had an idea . . .



12.30 Closing ceremony followed by lunch in the Grand Hall

Notes

Thursday morning, 14th April

Newton Room

Session 2 **Education**

Chair: Ed Chandler

09.30 How design students use ergonomics. Dr Hua Dong, Brunel University, UK

10.00 Workshop
Design for Real People: a campaign to introduce user-centred design into schools. Dr Rachel Benedyk, UCL, UK

11.00 Break in the Exhibition Hall

Thursday morning, 14th April

Teaching Room 1

Session 3 **Green ergonomics**

Chair: Margaret Hanson

09.30 HF/E in sustainable development. Dr Dave Moore, Scion Research, New Zealand

10.00 Workshop
Green ergonomics. Margaret Hanson, UK

11.00 Break in the Exhibition Hall

Ergonomics & Human Factors 2012

It's not too early to be thinking about next year's conference. It will be held from 17th to 19th April 2012 in Blackpool and we will soon be issuing the call for papers.

The deadline for abstracts is 10th October 2011 with author notification on 1st November. Final papers must be received by 9th December 2011.

Watch the Institute's website at www.ergonomics.org.uk for more details and the address of the special conference website where you will be able to find all the details you need.

Award Winners

Each year the Institute considers applications for a number of awards for achievements in the research or application of ergonomics. Please see the Institute website for details of all the awards, prizes and bursaries available.

NATS Human Factors' Team

Awarded the **President's Medal** for work that has made a significant contribution to original research, the development of methodology, or application of knowledge within the field of ergonomics.



NATS provides air traffic control (ATC) services to aircraft in UK airspace, and over the eastern part of the North Atlantic. NATS Human Factors' team aims to ensure that the human demands of the ATC operational units are balanced with the future strategy of the company. In addition, the HF Team works closely on the development and implementation of complex technical change projects and are pivotal to design, recruitment and training activities. The HF Team is led by Liz Skinner (pictured) who works directly for the Director of Safety and supports him in assuring the safety of the day-to-day operations and improving human performance capability.

In January 2010 NATS created the Prestwick Centre, which brought together the Manchester and Scottish ATC centres. The units had their own distinct culture, organisational structures, team configurations and watch structures. They completed their jobs using different tasks and procedures housed on different workstations, utilising different training and competency schemes, all controlled through different maintenance and engineering practices. The HF team worked to ensure that each issue was addressed throughout the design of the new centre. The application of ergonomics and human factors principles, methods and knowledge was a major part of ensuring that this very challenging transition was a success.

Dr.ir. Jan de Leede

Awarded the **Liberty Mutual Award** for the paper published in the journal *Ergonomics* that best contributes to the advancement of the practice of ergonomics.



Klein Hesselink J, de Leede J, and Goudswaard A, 2010, Effects of the new fast forward rotating five-shift roster at a Dutch steel company. *Ergonomics*, 53, 727-738.

This paper discusses a field study of shift roster changes at a large steel producer in the Netherlands. The purpose of the study is to help better understand the effects of relevant shift system characteristics on health and safety of shift workers.

Dr.ir. Jan de Leede (1968) is assistant professor of Human Resource Management, Faculty Management and Governance, University of Twente. In 2008, he created ModernWorkx, a research and consultancy firm focussing on evaluating shift roster systems, designing ergonomic friendly and efficient rosters and self-rostering. He is focussed on research and consultancy in the field of flexible labour, working times and virtual teams. His PhD was on self managing teams, including the contribution of such teams for product and process innovation.

Jan Mulligan

Awarded the **Ulf Aberg Award** for a postgraduate project.

Jan Mulligan has worked in the field of information technology for over 25 years, the last 14 of which have been focused on disability (assistive technology) and ergonomics. Jan now runs Greenleaf Ergonomics, an independent consultancy that specialises in the prevention, management and reduction of workplace ill-health and accessibility problems for all computer users, including those with complex issues surrounding medical conditions, physical disability, sensory impairment, literacy and cognitive needs.

Jan has an MSc in Human-Computer Interaction with Ergonomics from University College London. Her research considered user attitudes towards persuasive break reminder technology and explored the potential for systems that addressed both physical and psychological issues. Study participants were asked to consider their attitude to such systems and what conditions and situations might lead them to welcome, tolerate or reject such intervention. A user acceptance model was presented, which identified the need for a combination of knowledge, understanding, control and trust.



Pauline Cole

Awarded the **Ulf Aberg Award** for a postgraduate project.



Pauline Cole is a Chartered Physiotherapist who has specialised in Occupational Health since 2001. Initially working in the NHS and involved in the prevention and treatment of injuries for hospital staff she is currently the director of Workplace Health Direct Ltd., providing occupational health physiotherapy and ergonomics services to businesses. Her main area of interest is in the prevention of injuries, with a particular focus on work-relevant upper limb disorders. Pauline is also an executive committee member of the Association of Chartered Physiotherapists in Occupational Health and Ergonomics (ACPOHE).

Pauline has an MSc in Health Ergonomics from the University of Surrey. Her study examined the equipment purchasing process and the factors influencing equipment selection in an NHS Trust. A process mapping exercise and a series of focus groups were held. Results indicate a number of problems at different levels within the purchasing process exist.

Simon Grantham

Awarded the **Hywel Murrell Award** for an undergraduate project.



Simon studied Information & Communication Technology (BSc Hons) at Nottingham Trent University, graduating in 2010. His final year project focussed on evaluating the usability of a location-aware assistive technology for the Android smartphone platform called Route Mate. Route Mate, which is currently under development at Nottingham Trent University, is designed to aid the development of cognitive maps in individuals with intellectual disabilities, particularly those of school leaving age. The application's usability was assessed and captured quantitative measures relating to the amount of errors made by the participant and the amount of help they required to use the application. Using the results from the experiment a series of alterations were recommended to the functionality of the application and the GUI; these alterations are currently being implemented. Simon is currently a postgraduate student at the University of Nottingham studying for an MSc in Interactive Systems Design.

Bombardier Transportation Passengers

Awarded the **Ergonomics Design Award** for excellence in the application of ergonomics.



The 'S Stock' train was designed and built by Bombardier Transportation Passengers (BTPGR) as part of the London Underground sub-surface railway upgrade. The S Stock trains built in Derby incorporate extensive human factors work which has resulted in a vehicle design which is unique, efficient and provides a comfortable working and travelling environment.

The team which developed the S Stock not only included Bombardier's human factors specialists, led by Simon Cran (pictured), industrial designers and engineers but also the customer, London Underground, and other key stakeholder representatives. The project is significant given the widening of the human factors scope of work in the rolling stock development and the structured approach to considering the user as an integral part of the vehicle system design. The first trains entered service on 31 August 2010.

Notes

Further information

If you have a question just ask a member of the Secretariat at the registration desk and they'll be able to answer your question or point you in the right direction. If you want more information about the IEHF, please also visit the Institute website at www.ergonomics.org.uk.