

Track	Description	Track Topics	Track Manager
Practitioner Cases	<p>HF/E Practitioners participate in design and engineering projects, applying a systems ergonomics approach, resulting in real-world interventions in work systems. Share your practical approach, methods, results, and lessons learned, with colleagues, project engineers, and academics. One way to share insights and best practices is through case studies, thus bridging the gap between theory and practice.</p>	<p>Autonomous Systems  Forestry and Heavy Industries  Health Care (cross with Healthcare Track)  Human Machine Interfaces  Manufacturing &amp; Distribution  Maritime (Ships and Off-shore)  Process Industries including oil &amp; gas  <i>Service industries</i>  Analysis methods in practice  HF Design and Project constraints  HF Engineering  Job design  Virtual Reality for user participation</p>	Ruud Pikaar
Aerospace	<p>Aerospace HFE track is looking for contributions from research, academia and industry on novel approaches in aircraft and air traffic management human systems integration from various perspectives, including physiological, psychological, social, organizational, cultural, philosophical and political issues. We will provide a forum for discussions on the role of humans and organisations in analysis, design and evaluation of aeronautics and space complex systems.</p>	<p>Air traffic management design and ergonomics  Cockpit design and ergonomics  Flight performance (human issues)  Future of air transportation systems after COVID-19  Human space flights  Human-centered aircraft certification  Increasingly autonomous systems design and ergonomics  Passenger cabin design and ergonomics  Safety, efficiency and comfort in aerospace  Space habitats  Trust and collaboration in advanced aerospace systems</p>	Guy André Boy
Activity Theories for Work Analysis and Design	<p>ATWAD documents and disseminates theories and methods based on Activity approaches for field analysis and design. "Activity approaches" are understood in the broad sense: cultural and historical activity theory, but also situated approaches of action and cognition at work, workplace studies and practice-based approaches.</p>	<p>Activity analysis and simulation  Ergonomics Work Analysis  Situated action &amp; cognition  Work system design  Workplace studies</p>	Francisco Moura Duarte
Affective Design	<p>Affective design involves designing products, interfaces and services that are capable of eliciting emotional experiences from users. It also aims to determine emotions that are experienced by users in different contexts of product use.</p>	<p>Affective computing  Affective design  Citarasa engineering  Design experience  Emotion  Experience design  Kansei engineering  Product emotion</p>	Rosemary Seva

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Aging and Work	As the population ages, sustainable employment is critical. Work demands must be matched to fit with employee capacity to ensure older workers can remain at work. This stream will explore the issues facing older workers, interventions to maximise work ability and policy approaches to ensure successful longer working lives.	Aging workforce Musculoskeletal disorders (cross with MSD TC) Organisational demands Retirement Work environment Workability	Jodi Oakman
Agriculture	To present results and discuss how to reach a sustainable working life particularly with climate change, illnesses and other new challenges are more frequent for the farming population on top of the daily working life.	Agriculture Aquaculture Climate change Fishing Forestry Health and safety Horticulture Illness Injuries Rural Weather	Peter Lundqvist
Anthropometry	Techniques and findings in the measurement, standardization, comparison and application of Anthropometric data. The application of Anthropometric data could include amongst others the design and/or evaluation of wearable products, human modelling / Digital Human Models, workstations, occupant areas, clothing and footwear.	Clothing and footwear Human modelling / Digital Human Modelling Methods and Measurements Population Product design and evaluation Workstation & occupant space design and evaluation	Karen Bredenkamp
Biomechanics	Analysis of human movement, work posture and work method for bringing out factors leading to strain and fatigue at work. Application of the findings for humanizing work and ergonomic design of equipment/tool in order to achieve better efficiency and higher productivity.	Cumulative loading Gait analysis Manual materials handling Motion analysis Movement Kinematics and Kinetics Posture and stability Range of motion	Rauf Iqbal
Building and Construction	Building & Construction addresses the three broad areas of ergonomics: physical, cognitive and organisational. Although historically, the focus has been on physical ergonomics, there is a need to address cognitive, and organisational ergonomics relative to building and construction. With the advent of Industry 4.0, such related submissions add major value.	Architecture Building Built Environment Construction Industry 4.0	John Smallwood

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Ergonomics for Children and Educational Environments	A forum for the international exchange of scientific and technical ergonomics information related to children and educational environments. It promotes professional and public awareness of ergonomics related to children of all abilities in all aspects of their lives and the application of ergonomics in all educational environments.	Design for Children/Students Design for Teachers Dual-user Computer Environments Educational Environments; Flipped Learning, Digital learning Ergonomics in Education: k-12; University Studies; Home Schooling Technology & Education - AI & VR in Digital Classrooms Public Health & Safety issues in Educational Environments.	Sarbjit Singh
Ergonomics in Advanced Imaging	Ergonomics of advanced imaging systems such as virtual and augmented reality, stereoscopic displays, ultra-high resolution and high-dynamic range displays. All physical, physiological, psychological, cognitive, experiential, expressive and social characteristics of these display systems. Predicting and preventing cybersickness.	3D Augmented reality Cybersickness High Dynamic Range (HDR) Head-mounted display Near-eye display Simulator sickness Stereoscopic Ultra-high resolution Virtual Reality	Jukka Hakkinen
Ergonomics in Design for All	Research and implementation of the transversal design approach called Design for All / Universal Design / Inclusive Design. This includes person-centred design and applications to communication systems, environments, public services and fast-moving consumer goods, so that each environment / product / service can be accessed and used by as broad a range of people as possible. Involvement of real users including those with disabilities, the elderly, children, etc. in the design process. Ergonomic knowledge on differing human abilities / capabilities and diverse design goals.	Case study (cross track with Practitioner) Design for disability DfA (Design for all) / UD (Universal design) approach / process Environmental Design Human variability ICT (Information and Communication Technologies)-IoT (Internet of things) Leisure, culture and learning Pedestrian routes (cross factor with Slips, Trips and Falls) Product Design Visual contrast (cross track factor with Visual ergonomics)	Isabella Tiziana Steffan
Ergonomics in Manufacturing	Ergonomics and human factors related to occupational tasks in facilities of mass production. Examples include controlling injury risk while ensuring quality and productivity on assembly lines, accounting for engineering constraints, optimizing the cognitive aspects of process control systems, integrating lean manufacturing and the migration to Industry 4.0.	Assembly line Engineering Fine assembly (small scale) Industry 4.0 Lean Manufacturing ( <i>cross with HF and Sustainable Development &amp; HF in Supply Chain Design and management</i> ) Manufacturing Process control systems Quality	Jim Potvin

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Ergonomics Work Analysis and Training (EWAT)	Contributions of ergonomic analysis of work activity (of workers, trainers or trainees) to the improvement, design or evaluation of training and learning devices, tools and contents. How training course design, based on an ergonomic analysis of work, allows re-examination of work and its conditions. The resources and conditions needed for the development of workers in a systemic approach linking training and work. The major changes that the world of work is undergoing and accompanying (aging populations, massive data work, cobotics, environmental transformations, artificial intelligence, etc.) are challenges for adequate training conception, for workers and their supervisors, concerned with their skill development and their health.	Activity analysis Knowledge and know-how transfer Learning Professional skills Training Training design and evaluation Work	Catherine Delgoulet (Marta Santos)
Gender and Work	This track aims to describe and discuss diverse approaches to the consideration of sex and gender in ergonomics, including methods, development / implementation / evaluation of interventions, and knowledge transfer, in all activity sectors and topics in the field of ergonomics and human factors.	Work-life balance Sex SGBA (sex-gender based analysis) GBA (gender-based analysis) Sex/gender differences Women (or Men) Masculinity Invisible Work Work family balance Intersectionality	Marie Laberge
Health and Safety	Ergonomic / Human Factors research and application are central to creating workplaces where no accidents or occupational diseases occur. This track encompasses all the leading contemporary applications and advancing technologies used by ergonomists or occupational health and safety professionals to improve safety culture, manage accidents and risk, plan prevention & intervention or use personal protective equipment as a last resort.	Accidents Prevention & Intervention Protective equipment Risk Safety culture	Gyula Szabó

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Healthcare Ergonomics	The Healthcare Ergonomics track discusses how human factors and ergonomics contribute to the quality and resilience of our healthcare system. Topics range from physical and cognitive to behavioral and organisational ergonomics, e.g. from patient handling and decision making to therapy adherence and value-based healthcare. Special attention will be paid to HFE research methods in the medical domain and COVID-19 related research.	COVID-19 Decision making Patient engagement Prevention Quality of life Research Methods Sociotechnical system design Tailored care Tools and equipment Work processes	Marijke Melles
HF in Supply Chain Design and Management	Human factors determine the performance of all levels of supply chain, from components procurement to production systems, from material handling and intralogistics to operations management, from distribution logistics to forecasting demand. Emerging technologies (Industry 4.0) can support the human at all level, from operational to management. This track aims at investigating the development of innovative approaches for the integration of human factors in digital supply chain design and management, with particular emphasis on Industry 4.0 technologies.	Behavioral Operations Fatigue Human Errors Injury prevention Intra-logistics Lean Management (cross with <i>Ergo in mfg</i> ; <i>HF in sustainable development</i> ) Learning and / or forgetting Logistics 4.0 Material Handling Operations Management Quality Management Supply chain Warehousing	Fabio Sgarbossa
HF/E Contribution to Cope with Covid-19	The track will include the work done from HFE experts to cope with the emergency during the Covid-19 pandemic. HFE experts gave their contribution in many different areas of work and applied their expertise in order to facilitate workers and citizens in performing difficult activities during the emergency. Sharing knowledge and lessons learned is of great value for participants of IEA2021 and for preparing organizations and systems for future unexpected events.	HF/E in response to Covid-19 in healthcare HF/E in response to Covid-19 in education HF/E in response to Covid-19 for smartworking HF/E in response to Covid-19 in transportation HF/E in response to Covid-19 in manufacturing HF/E in response to Covid-19 in simulation	Sara Albolino, Andrew Todd and Tommaso Bellandi
HF/E Education and Professional Certification	This track focuses on the development and improvement of professional educational programs in ergonomics and human factors and on building up the profession. The track includes special sessions on education and certification and provides examples for the development of HFE at national or regional level. Participants are invited to share experiences on these topics and participate in discussions on the challenges involved.	Human Factors / Ergonomics Education Human Factors / Ergonomics Certification Endorsement Emerging Ergonomics	Chien-Chi (Max) Chang, and Maggie Graf

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Human Factors and Sustainable Development	Human Factors and Sustainable Development looks at all aspects related to creating a sustainable future for all. The HFE work ranges from microsystems (the design of sustainable work systems) right the way through to macrosystems (the design of sustainable organisational systems) and global systems (eg. global responses to cross-national work systems - global supply chains and epidemiological work).	Design for sustainability Design of the sustainable built environment Ecomobility Ergoecology Green ergonomics HFE and recycling HFE and climate change <i>Lean manufacturing (cross with Ergo in mfg; HF in Supply Chain Design and management)</i> Sustainable organisations Sustainable work systems	Andrew Thatcher
Human Factors in Robotics	Bringing together research, that applies theories, principles, data or methods in order to plan, design or evaluate human-centered and productive human-robot interaction systems, including body-worn robotics like exoskeletons. We strongly welcome a focus on practical applications from various backgrounds including production, service and healthcare robotics.	AI and Robotics Big Data in Robotics Exoskeletons Human-Robot Collaboration Human-Robot Interaction Robotic Design Safety in Hybrid Robotic Work Systems Social Robotics Task allocation in Hybrid Robotic Work Systems Trust in Robotic Systems Telerobotics	Sascha Wischniewski
Human Modeling and Simulation	In virtual prototyping and human-centred product design, digital human modelling and simulation (DHM) is an essential enabler during the conception and design phases. DHM allows the simulation and evaluation of new product and work system designs in terms of usability, performance and comfort.	Digital human modeling Human Machine Interface (HMI) Human Simulation Human system Integration (HSI) User centred design	Gunther Paul
IEA International Development	The IEA International Development (ID) Standing Committee promotes, coordinates, and implements ergonomic activities in industrially developing countries by supporting local and regional initiatives concerning research, development, training, and conferences. The committee implements ergonomics development programs in industrially developing countries and collaborates with other IEA committees with interests in industrially developing countries.		Andrew Todd

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Mining	Applications of human factors and ergonomics to activities associated with the extractive industries broadly defined, including exploration, mining, processing, and rehabilitation.	Automation Fatality prevention Human-Systems Integration Interface design Mining equipment design Remote operations centres Risk management Teleoperation Training Vibration Virtual reality Working in extreme environments (heat, cold, altitude, underground)	Robin Burgess-Limerick
Musculoskeletal Disorders	Share ergonomics research and “best” practices on risk assessment, prevention and management of work-related musculoskeletal disorders. This includes the design of jobs, tasks, tools, and work organization.	Musculoskeletal disorder risk Posture Repetition Sedentary work Vibration	Ann Marie Dale
Neuroergonomics	Neuroergonomics is the study of human brain (and other aspects of the nervous system) in relation to performance at work and in everyday settings. We may optimise working conditions, but cognition, emotions and personality will drive the behaviour of people at work. Interventions are needed that take into account individual differences.	Behaviour Brain and Work Cognition and Ageing Emotions Neurophysiology and Neuroimaging Neurorehabilitation Personality	Nelson Ekechukwu
Organizational Design and Management (ODAM)	Based on a sociotechnical, macroergonomics, perspective, Human Factors in Organizational Design and Management (ODAM), focuses on the overall innovation and design of work systems, including work content and organization teamwork and management of psychosocial work environment. Participatory approaches are key elements in transforming work systems, understanding dynamic systems, complexity, and examining interactions among human, environmental and societal issues.	Flexible work organisations Job and work design Macroergonomics Management - leadership Organizational change and management Participatory ergonomics Prospective Ergonomics Psychosocial issues at work Sociotechnical system design and complexity Well-being and organizational issues Work organization	Laerte Idal Sznelwar

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Slips Trips and Falls	Holistic falls prevention on level surfaces, stairs, ramps and at heights, considering the capabilities of the individual, their footwear, activity, environmental aspects, slip resistance measurements and design issues.	Age related issues {Ageing and work; Healthcare Ergonomics} Cleaning and maintenance issues External spaces and icy conditions Falls from heights {Building & Construction} Flooring properties and performance Footwear design and performance Healthcare settings {Healthcare Ergonomics} Home environments and bathing areas Improving the reliability of slip resistance measurements Occupational injuries {Health & Safety, Healthcare; Manufacturing} Preventative research, virtual reality {Biomechanics, Musculoskeletal} Stairs, ramps and handrails {Design for All} Sustainable slip resistant design {Design for All} Universal design {Ergonomics in Design for All}	Richard Bowman
Systems HF/E	Systems HF/E methods are used to describe, understand and simulate the behaviour of complex sociotechnical systems. This track covers work involving the use of systems HFE modelling methods to optimise safety and performance.	Complexity Modelling Systems analysis System design Systems thinking	Paul Salmon
Transport Ergonomics and Human Factors (TEHF)	Ergonomics and human factors related to the safe, effective, and practical human use of transportation systems and technology.	Automated and connected vehicles Driver monitoring, workload, distraction, inattention, vigilance and impairment. Drones and Unmanned Vehicles Human error and collision investigations Navigation and mobility needs Physical ergonomics in transportation Safety and usability of driver-vehicle interactions Training and education Warnings and human-machine interface design	Peter Burns
Visual Ergonomics	Scientific and practice-related topics in visual ergonomics, as intervention studies, experimental findings, development of assistive technologies, mixed realities, occupational optometry, visual aids, lighting, organizational measures, theory, and more (see also list of keywords). Discussions following the paper presentations aim to foster the link between theory and practice and to elaborate on minimum standards in visual ergonomics for enabling an optimal combination of comfort, well-being, and performance at visual tasks and system designs.	Asthenopia Blue Light Case studies Colour Computer Vision Syndrome (CVS) Lighting Low vision Near work Stereovision	Marino Menozzi



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Work with Computing Systems (WWCS)	To advance ergonomic knowledge on how to design and evaluate effective and health-promoting computing systems to support the individual and cooperative work of humans in organizations. WWCS considers all kinds of systems for stationary and mobile computing that are used in the workplace.	Automation Human-Computer-Interaction Human system integration Mixed reality Online communities Usability and User Experience	Nicole Jochems
Other		Other (specify)	Wayne Albert