



# 20<sup>th</sup> ANNUAL HUMAN FACTORS AND ERGONOMICS SYMPOSIUM

September 17, 2020

**7:45**      **Webinar Open for Log In**

**8:00**      Welcome – Randy Picket, PSHFES President

**8:15**      Human Factors & Ergonomics Society (HFES) President's Address – Susan Hallbeck

**8:25**      **Strategies for Automation-Proofing Your Job**

Gary Davis, MS, CPE  
Ergonomist, Boeing Company

Automation (machines or software algorithms) is expected to replace many of the routine, predictable, task components of future worker jobs. By focusing worker skills and training on uniquely human capabilities (e.g., creative thinking to solve unique workplace problems, and human-to-human interaction), workers can stay necessary and valuable - working with automation as a tool, not competing with automation. A suggested strategy for “automation proofing” your job in this way is presented.

**9:05**      **Practical Work System Analysis**

Richard Holden, PhD  
Associate Professor, Indiana University School of Medicine

This talk will briefly define sociotechnical work systems and advance the notion that “human factors is system factors.” Dr. Holden will present, in a practical way, the SEIPS systems model and several practice-oriented SEIPS tools almost anyone can use. Examples from healthcare will illustrate the use of these tools. This presentation will end with thoughts about how systems-oriented professionals can contribute to equity and social justice.

**9:45**      Vendor Presentation

**9:50**      **Break**

- 10:05      Ergonomics and Work-Related Musculoskeletal Injuries in Surgeons: The Next Epidemic?**  
Geeta Lal MD MSc FRCS(C) FACS  
Endocrine Surgeon, Associate Professor  
University of Iowa

This lecture will provide an overview of the scope of work-related musculoskeletal disorders among surgeons and surgical trainees. It will also describe some of the contributing and exacerbating factors to these injuries as well as their consequences. Lastly, it will explore potential strategies that may help to improve ergonomics inside and outside the operating room.

- 10:45      Fatigue Failure as an Etiological Mechanism for Musculoskeletal Disorders**  
Sean Gallagher, PhD, CPE, FAIHA  
Associate Professor, Auburn University

Fatigue failure is the mechanism by which materials incur damage when exposed to repeated stress and appears quite relevant to the development of musculoskeletal disorders (MSDs). This presentation will provide evidence that MSDs may result from fatigue failure, and will consider some unique aspects associated with fatigue failure in a complex biological environment (involving self-healing materials). New risk assessment tools based on fatigue failure principles will be discussed.

- 11:25      Vendor Presentation**

- 11:30      Ergonomics Professional of the Year Award**

- 11:35      Break**

- 11:55      Designing and Evaluating Fit and Comfort for Virtual Reality Hardware**  
Dan Odell, PhD, CPE  
Staff Researcher, Google Inc.

In this talk, Dr. Odell will give an overview of the main challenges in designing a comfortable Head Mounted Display. This will include a deep dive into research he led exploring the relationship between headset weight and comfortable wear time. Dr. Odell will conclude with some of the specific experience targets the team used in creating the Google Daydream View, called "the most comfortable VR headset ever created" by Digital trends in 2016.

- 12:35      A Practical Guide to Home Office Ergonomics**  
Alan Hedge, PhD, CPE, C.HFE  
Professor Emeritus, Cornell University

Most home offices are not set up as ergonomic designs, and consequently those working from home may experience musculoskeletal issues that previously hadn't appeared. This webinar will briefly cover what you need to do to organize your home office so that it is a better ergonomic design that will improve your comfort and reduce any injury risks, and also address sources of stress. Information will be provided on a free app, called Home Office Ergonomics (available in the Apple and Google app stores) that allows you check your setup and gives you lots of tips on how to improve your home office setup.

- 1:15      Vendor Presentation**

- 1:20      Speaker Panel Discussion/Questions**

- 1:45      PSHFES Closing Remarks**

# Speaker Biographies

## **Gary Davis, MS, CPE**

Gary Davis is an Ergonomist at The Boeing Company, where he works with manufacturing engineers, and shop floor workers, to develop low ergonomic risk, shop-accepted, hand-held tools, larger tooling, and automation systems. He previously worked at the Washington State Department of Labor & Industries on the Ergonomics Rule, and at Lockheed as a Human Factors Engineer. Gary has his Master's Degrees in Occupational Ergonomics, Human Factors Engineering, and Electrical Engineering. He is a Certified Professional Ergonomist (CPE). Gary received PSHFES's Ergonomics Professional of the Year award in 2016.

## **Sean Gallagher, PhD, CPE, FAIHA**

Sean Gallagher is the Hal N. and Peggy S. Pennington Professor of Industrial and Systems Engineering at Auburn University. His award-winning research on the etiology of musculoskeletal disorders has recently led to the development of validated assessment tools that can more easily and comprehensively assess ergonomic injury risk in occupational settings. Dr. Gallagher is a Certified Professional Ergonomist, a Fellow of both the American Industrial Hygiene Association and the Human Factors and Ergonomics Society. He is a two-time recipient of the IEA/ Liberty Mutual Medal in Occupational Safety and Ergonomics, first in 2013 and again in 2018. He received his PhD from The Ohio State University in 2003.

## **Alan Hedge, PhD, CPE, C.HFE**

Dr. Alan Hedge is an ergonomics and indoor environmental design expert with over 4 decades of experience on these topics. He currently runs Humanuse, an ergonomics consulting company. He was a full professor in Department of Design and Environmental Analysis at Cornell University for over 30 years and is now Professor Emeritus . He is an extensively published author with 4 books and over 250 publications. He has received numerous awards for 'outstanding human factors contributions'. He is a Fellow of the Human Factors and Ergonomics Society, the Institute of Ergonomics and Human Factors, and the International Ergonomics Association. Dr. Hedge is often cited in the national and international media and has appeared on several TV and radio programs.

## **Richard Holden, PhD**

Dr. Holden is Chief Healthcare Engineer at the Center for Health Innovation and Implementation Science, Indianapolis, IN. In that role he develops strategy and coaches change agents innovating and implementing solutions to improve health and healthcare for all. He is also a tenured professor of medicine at Indiana University. Dr. Holden has led or supported over 20 federal research or demonstration projects, totaling over \$75 million. He has authored over 150 peer-reviewed works in the fields of human factors engineering, patient safety and quality, health informatics, and research methods. His latest book *The Agile Network* will be out this fall.

**Dr. Geeta Lal, MD, MSc FRCS© FACS**

Geeta Lal MD MSc FRCS(C) FACS is a tenured Associate Professor of Surgery at the University of Iowa, where she also serves as Co-Leader of the Endocrine Multi-disciplinary Oncology Group (at the Holden Comprehensive Cancer Center). She is a fellowship-trained Endocrine surgeon with a practice focus in thyroid and parathyroid disease, including pediatric thyroid cancer and re-operative surgery. She was an NIH-funded investigator for many years before transitioning to her current administrative role as the Associate Chief Quality Officer/Director of Inpatient Quality and Safety at her institution. She continues her research in this area and is passionate about studying and spreading awareness about the impact of ergonomics on surgeons' professional and personal lives.

**Dan Odell, PhD, CPE**

Dan Odell, Ph.D., CPE is the Human Factors Lead for Google's Augmented Reality team. At Google, Dan blends ergonomics, UX, mechanical engineering, and Human Computer Interaction (HCI) to create meaningful new experiences that are desirable, effective, and make people smile. The Daydream View is an example of his work, called "the most comfortable VR headset ever created" by Digital Trends. Most of Dan's early career was spent on Microsoft's hardware team where he worked on input device and computer form factor innovation. Highlight products include: the ubiquitous Natural Ergonomic Keyboard 4000, the Sculpt Ergonomic Keyboard, the first ever Natural mouse, the Arc Touch mouse, as well as Microsoft's Surface tablets. Dan did his Ph.D. in mechanical engineering at UC Berkeley, is a certified professional ergonomist, and is a past-president of PSHFES.