International Society for Occupational Ergonomics & Safety

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ISOES XXXVIII

November 5th & 6th 2026

Hosted by the University of Guadalajara

The hybrid conference will have in-person and remote options for attendance for presenters and attendees.
The ISOES website will have the most up-to-date information when the details have been finalized.

Click to upload your 350-word abstract submission now!

Letter from the President

- James Vachon, MS, ARM, AIC

It is an incredible honor to address you as the new President of ISOES. I am truly grateful for the trust and confidence you have placed in me, and I want to sincerely thank my predecessor, George Page, for his outstanding leadership and dedication.

As we begin this exciting new chapter, we find ourselves at a time of tremendous change and opportunity. Advancements in technology and artificial intelligence (AI) are reshaping the way we engage with our work, our members, and the broader community. My vision for the coming year is to help our organization thoughtfully embrace these innovations to empower our members, drive operational efficiency, and fuel continued growth.

Additionally, our presence and engagement on social media platforms have become more important than ever. Strengthening our social media strategy will allow us to better connect with our members, share timely updates, and showcase the great work being done across the society. By fostering dynamic online conversations and increasing our visibility, we can amplify our mission and expand our reach. I encourage each of you to join the conversation and engage with us on social media. Your voices and insights are crucial as we navigate these exciting developments together.

We are happy to announce that our 2026 38th Annual International Occupational Ergonomics and Safety Conference will be held in Guadalajara, Jalisco Mexico on November 5th and 6th. We will once again be hosting a hybrid conference to accommodate those who cannot join us in person. Conference updates will be available as soon as we have the group rate information available for booking your room and other important logistics information. As always, the most up-to-date information on the 2026 conference can be found on the ISOES conference webpage (updates coming soon).

Thank you for your continued support and enthusiasm. I look forward to working with all of you to make this a year of innovation, collaboration, and meaningful progress.

With appreciation,

James Vachon

ISOES President 2025-2026

New Executive Committee Position: Outreach Manager

- Josdell Guerra Ruiz

Josdell is a soon to be graduated master's in public health student from the University of Texas at El Paso. Her research experience merges the fields of occupational health and environmental exposure, risk assessments, and ergonomics. She currently studies fine particulate matter in the El Paso del Norte Region at targeted international ports of entry and has participated in other research projects within the Bioergonomics Laboratory and Page Engineering Inc. Ranging from miRNA expression on mechanically loaded tendons to performing ergonomic assessments on railroad workers. As a new addition, Josdell is our new outreach manager for the ISOES team! She will be sharing everything about our conferences, online workshops, and news. Be prepared if you see her with a camera since you will most likely appear on our website, LinkedIn, or Instagram. Her deep excitement for the field has motivated her to share it with others and she would be honored if she can encourage more people to participate in it. Not only that, but Josdell offers a new look (very Gen Z, 21st Century as we call her) to our work, making it more manageable and fun to interact with. Josdell believes it is important that we highlight how interesting, fascinating, and relevant the world of Ergonomics and Safety is.

2025 Student Award Winner

- Ehsan Shourangiz

I am a Ph.D. candidate in Construction Management at Louisiana State University, which I joined in 2022 after several years of experience in construction. My interest in biomechanics and exoskeletons began after taking a biomechanics course and, through research with my advisor, Dr. Chao Wang, I explored EMG and dynamic construction tasks to inform the power control strategies of active exoskeletons.

At the ISOES 2025 Conference, I presented "Biomechanical Insights for Adaptive Exoskeletons: EMG Based Identification of Critical Lower Limb Muscles in Construction Climbing." Our pilot study analyzed eight lower-limb muscles during walking and ladder climbing, revealing that climbing heavily engages the quadriceps.

Receiving the ISOES Student Award is an honor and motivates me to continue advancing this research while gaining valuable insights from the ISOES community.

ASSP Safety 2025 in Orlando, FL

- Jim Borchardt & Steve Fleming

For the seventh time since 2015, ISOES was an exhibitor at ASSP Safety 2025 Conference and Exhibition in Orlando, FL at Orange County Convention Center (OCCC) July 22-24, 2025. OCCC provides 2.1 million feet for exhibitors and 480,000 feet of meeting areas.

Our ISOES Booth joined 450+ national and international exhibitors and was strategically located near universities exhibiting their Safety/Health and Ergonomic (SH&E) programs. ISOES volunteers staffed the booth on a rotating basis including Steve Fleming, Christopher Reid, Jim Vachon, Anand Iyer, Richard Wyatt, Clarence Rodrigues, and Gabe Ibarra-Mejia.

Dr. Christopher Reid (Boeing) gave the keynote presentation: "The Boeing Ergonomics Journey in Combating Workplace Musculoskeletal Disorders" at the 37th annual ISOES conference, which also took place in Orlando following the ASSP Conference. Dr. Carter Kerk gave a dinner presentation about the Tiospaye Scholar Program at South Dakota Mines. Both presentations set the tone for a fantastic ISOES XXXVII.

-Second from left: Dr. Christopher Reid

How AI is Transforming Ergonomics and Shaping Safety Culture

- Anand S. Iyer
Managing Principal – JFAssociates, Inc., Chantilly, VA

The integration of artificial intelligence (AI) in ergonomics and safety has reshaped how organizations assess risks, design work environments, and prevent workplace injuries. AI technologies—ranging from machine learning algorithms to wearable sensors—are now central to both predictive analytics and real-time ergonomic assessments. In the modern era of technological advancement, Artificial Intelligence (AI) has emerged as a transformative force across various domains, including ergonomics

and workplace safety. The integration of AI into these fields presents unprecedented opportunities to optimize human-machine interaction, predict and prevent hazards, and create safer, more efficient work environments (Wilson & Sharples, 2015).

AI in Ergonomics

AI systems have enabled rapid and highly precise ergonomic risk assessments. By leveraging advanced data analytics, computer vision, and wearable sensors, these systems can capture and analyze workers' postures and movements, flagging ergonomic risks almost instantaneously. For instance, recent studies describe AI-enhanced methodologies that automate the identification of hazardous movements and calculate ergonomic risk levels, leading to faster interventions and more personalized recommendations for risk mitigation (Ispășoiu et al. 2024; Donisi et al. 2024). In addition, AI-driven tools can simulate worker tasks and automate the assessment process, increasing both accuracy and scalability (Trstenjak et al., 2025).

AI contributes significantly to ergonomic design by analyzing vast datasets related to human movement, posture, and behavior. Machine learning algorithms can process data collected from motion sensors, cameras, and wearable devices to assess how workers interact with tools, machines, and environments (Cui et al., 2020). This real-time analysis enables the identification of poor postures or repetitive motions that could lead to musculoskeletal disorders (MSDs). With this insight, AI systems can suggest modifications to tools or workflows to reduce strain and improve comfort.

Additionally, AI-driven simulations can predict how design changes affect human performance. Virtual prototypes, created through AI and computer-aided design (CAD), allow ergonomic assessments before physical products or workstations are built. This reduces development costs and ensures optimal design from the outset (Hasan et al., 2018).

AI in Workplace Safety

Beyond ergonomics, AI is revolutionizing occupational safety by enabling predictive analytics for incident prevention, hazard detection, and safety climate assessment. AI-powered platforms can process vast datasets from workplace sensors, safety reports, and employee health records to predict accidents, recommend safety interventions, and optimize workflows (Fiegler-Rudol *et al.,* 2025). These systems not only reduce the risk of physical injuries but also support the emotional well-being of workers by identifying stressors and enabling proactive mental health support (Trujillo *et al.*, 2025). One of the most powerful applications of AI in safety is predictive analytics. By analyzing historical safety records, environmental conditions, and operational data, AI can forecast potential safety incidents (Khosravi *et al*., 2021). These insights allow organizations to proactively implement preventative measures rather than reacting to accidents after they occur. For example, AI algorithms can detect patterns in workplace incidents and identify high-risk zones or practices. In manufacturing and construction, where heavy machinery and complex processes pose significant risks, AI systems can alert supervisors when unsafe behaviors are detected. This real-time monitoring helps prevent injuries and maintain a culture of safety (Zhou *et al.*, 2017).

Challenges and Future Directions

While AI offers substantial benefits, challenges remain around data privacy, algorithmic bias, and the need for interdisciplinary collaboration. Ensuring that AI-driven assessments remain transparent and ethically grounded is crucial as these systems become increasingly embedded in daily operations. Privacy concerns may arise from constant monitoring, especially with wearable devices. There is also the risk of over-reliance on AI, which could lead to complacency among human workers. To address these issues, it is essential to ensure transparency in AI operations and to strike a balance between technological assistance and human judgment (Jobin *et al*., 2019).

Conclusion

AI is playing a transformative role in ergonomics and workplace safety by automating assessments, predicting risks, and supporting both physical and mental well-being. The evidence from recent peer-reviewed research points to a future where AI-driven systems are integral to creating safer, more efficient, and worker-centric environments. From enhancing ergonomic design and preventing injuries to improving training and real-time monitoring, AI serves as a powerful tool in creating safer, more efficient work environments.

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Per- and Polyfluoroalkyl Substances (PFAS)

(AKA perfluorochemicals, PFCs)

- Jim Vachon, MS, ARM, AIC

What are PFAS?

- Per- and polyfluoroalkyl substances (PFAS), previously referred to as perfluorochemicals (PFCs), are human-made chemicals that do not occur naturally in the environment. The chemical structure of PFAS have a fluorinated carbon chain, either partially or fully fluorinated, connected to different functional groups.
- Currently, there are thousands of chemicals that are considered PFAS.
- PFAS have been widely used in consumer, commercial, and industrial products since the 1950s.
- Many PFAS also known as "forever chemicals" break down very slowly in the environment.

What are PFOS and PFOA?

- Perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) are two chemicals in the PFAS family. They are also human-made chemicals that do not occur naturally in the environment.
- These two PFAS were produced in the largest amounts in the U.S. and are commonly found in our environment.
- PFOS and PFOA can also be formed by environmental microbial degradation or by metabolism in larger organisms from a large group of related chemicals or precursor compounds.
- Companies have stopped production or have begun changing manufacturing practices to reduce releases and to reduce the amounts of PFOA and PFOS chemicals in their products.

What are the uses of PFOS and PFOA?

- PFOS and PFOA have been used in surface protection products, such as carpet, clothing, and cookware (Teflon, Nonstick) treatments, and coating for paper, furniture and some food packaging materials (e.g., microwave popcorn bags, fast food containers, candy wrapper and pizza boxes), and personal products like shampoo, dental floss, nail polish, eye makeup, etc.
- Industrial uses of these chemicals are in photo imaging, metal plating, semiconductor coatings, aviation hydraulic fluids, medical devices, insect baits, printer and copy machine parts, chemically driven oil production, rubber and plastic industries.
- Both chemicals have also been present in some foam firefighting materials.

What are the environmental impacts of PFOS and PFOA?

- PFOS and PFOA can be found in air, soil, and water (ground and surface water) after release from the manufacture, use, and disposal of products that contain these chemicals.
- PFAS (including PFOS and PFOA) in air are expected to settle to the ground within days to weeks.
- They breakdown very slowly in the environment and are often characterized as persistent.

How are people exposed to PFOS and PFOA?

- People may be exposed to PFOS and PFOA from the air, indoor dust, water, food and numerous consumer products. Also, people may be exposed to these chemicals from treated carpets and upholstery; this is especially true for children.
- Food is anticipated to be a source of exposure to these chemicals. Environmental contamination or through migration from food packaging are two pathways for PFAS to enter the food chain.
- Since PFAS have been detected in human breast milk, infants may be exposed to these chemicals through breast milk, and from "not intentionally added" PFAS such as in the case of recycled plastic that may constitute a portion of the new packaging materials.
- Workers in the perfluorochemical industry can be exposed to greater amounts of PFOS and PFOA than in general population.

How can PFOS and PFOA affect people's health?

- The human health effects from exposure to low environmental levels of PFOS and PFOA are not known.
- Some of the available studies suggest that increase in blood cholesterol levels is associated with higher PFOS and PFOA blood levels. One such study originated from the C8 Science Panel formed as part of the "Dark Waters" class action suit and integral to DuPont settlement.
    - The DuPont case set precedent for the C8 Independent Science Panel gathered to investigate the potential links between PFOA exposure and human health effects.
    - The C8 concluded probable links between PFOA exposure and the development of kidney and testicular cancer, ulcerative colitis, thyroid disease, pregnancy-induced hypertension, and high cholesterol.
- The International Agency for Research on Cancer has concluded that PFOA is *possibly carcinogenic to humans* (Group 2B) based on *limited evidence* in humans and *limited evidence* in experimental animals as to the carcinogenicity of PFOA.
- The U.S. Environmental Protection Agency (U.S. EPA) concluded that there was suggestive evidence of carcinogenic potential of PFOA and PFOS in humans.
- Currently, there is no consistent scientific evidence that PFOS and PFOA cause cancer in humans. Some increases in kidney and testicular cancers have been seen in highly exposed individuals, mostly occupational exposures. These results should be interpreted carefully since the effects were not found consistently across studies, there were contradictory findings between studies, and exposure levels were much higher than seen in the general population.

How can people reduce the risk of exposure to PFOS and PFOA?

- People may choose to use consumer products that do not contain PFOS, PFOA, and other PFAS.
- People whose well water contains these chemicals above U.S. EPA's drinking water advisory levels, may choose to install an activated carbon filtration system or reverse osmosis system.
- U.S. Food and Drug Administration (FDA) has not established standards for PFAS contaminants in bottled water. Therefore, U.S. EPA does not currently support bottled water use for communities based solely on concentrations of PFAS in drinking water that exceed recent (2022) U.S. EPA health advisory levels.

Has the federal government made recommendations to protect human health?

- In 2016, to provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOA and PFOS in drinking water, U.S. EPA established the health advisory levels at 70 parts per trillion (ppt) or 0.07 µg/L.
- In 2022, U.S. EPA replaced the 2016 advisories with updated *interim* lifetime health advisories for PFOA and PFOS of 0.004 ppt and 0.02 ppt, respectively. U.S. EPA also established lifetime health advisories for perfluorobutane sulfonic acid and related compound potassium perfluorobutane sulfonate, together referred to as "PFBS" of 2,000 ppt and hexafluoropropylene oxide (HFPO) dimer acid and its ammonium salt, together referred to as "GenX chemicals" of 10 ppt.
    - These health advisories were updated by U.S. EPA in 2022 based on recent studies. This health advisory level offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water. The critical health effect

the *interim* health advisories for PFOA and PFOS were based on are decreased antibody response in children to tetanus and diphtheria vaccination, respectively.

- The Occupational Safety and Health Administration (OSHA) has not set any legal limits for PFAS including PFOA and PFOS in air.
- The National Institute of Occupational Safety and Health (NIOSH) has not set any recommended limits including PFOA and PFOS in air.

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