International Society for Occupational Ergonomics and Safety

Spring 2021 Newsletter

Letter from the President

Clarence C. Rodrigues
PhD, PE, CSP, CPE
ISOES President

Welcome to the mid-year message from your president. I hope all of you are staying safe and life is in the process of getting back to some semblance of normality for each of you and your families. This continues to be a tough year but hopefully it will get better by the summer. I continue to get support from our extremely dedicated group of professionals - our Executive Committee (EC). This communication is intended to keep you updated on our progress with respect our stated objectives. As always there have been some successes while others are a work-in-progress.

Annual Conference Update: We have set the dates of our annual conference which is September 16-17 and it is going to be completely virtual. Given the uncertainties of the future, we decided early in this cycle to firmly commit to going virtual so as to avoid the logistical conundrum of whether to go in-person, virtual or hybrid. More importantly the potential conference attendees will have something concrete to work with and plan early. We also decided to make the conference absolutely free as we can afford to do so as costs associated with running a virtual conference are measly while our finances are in good shape. In addition, we have secured a DNI number for the conference proceedings. Lastly, we have updated our paper awards to include a non-student and student category - up to 3 of the best papers in each category will be awarded a monetary sum, the combined value of which shall not exceed $500. We hope the above strategies will significantly increase paper submissions and attendance. As an icing on the cake, we have managed to secure the very high profile keynote speaker Dr. Waldemar Karwowski, Pegasus Professor and Chairman, Department of Industrial Engineering and Management Systems University of Central Florida. We expect a great showing at our conference this year.

2019-2020 Treasurers Report: For tax year 2020, the income was $2392.39 (that included conference registrations and ISOES membership dues as of September 17, 2020), and the expenses were $727.90 (that included conference expenses which were $0.00, thanks to UTEP – Gabriel Ibarra, monthly webhosting and payment made to cross reference for DOI). Form 990N was filed and accepted for 2019 and the Annual Corporations Report was submitted and filed for 2020. Our current balance as of this writing is $77,888.65 ($25,856.09 at BofA + $52,032.56 at Morgan Stanley) and our total membership count is 60 that includes 44 full members and 16 student members.

The Outreach Grant Initiative: The primary function of these Outreach Grants is to provide limited support to academicians, practitioners, students and other professional for their outreach service endeavors related to ergonomics, human factors, and safety. The goal is to provide funding for projects that incorporate evidence-based practice and support initiatives that are congruent with ISOES's purpose and mission.

Expand the visibility and usefulness of ISOES: Our society continues to be a great interface between the academic and industry world. One of our esteemed members, a past conference presenter and current graduate student, is making use of the ISOES network to distribute an industry-specific survey relevant for her dissertation. Keep an eye out for an upcoming email regarding the survey. We encourage this type of communication and welcome other members to make use of the extensive ISOES network.

Miscellaneous: Speaker gifts new design (pens with ISOES logos) have been approved by the EC and coordination with the vendor for the initial order is in progress. As part of our reach-out-to-a-member initiative, Ram Maikala, Senior Program Specialist with Providence Shared Services was the first member to sign on to get involved – thanks Ram! The overall response has been poor so we hoping that more of you will respond and get involved. Several other initiatives are underway that will be outlined in the next newsletter.

That's all folks! I hope you enjoy reading the rest of the newsletter and I wish you a successful 2021.

XXXIIIrd Annual International Conference
International Society for Occupational Ergonomics & Safety

VIRTUAL CONFERENCE
Call for Abstracts

Date &	**September 16-17, 2021**
Cost	**FREE: New for 2021, there will be no conference registration fee.**

Submission Requirements & Deadlines	**Abstract Submission (350 words):** April 30, 2021 **Abstract Acceptance Notification:** May 15, 2021 **Final Abstract/Paper Submission*** June 30, 2021 • All submissions are to be made via EasyChair: ISOES Submission Portal (https://easychair.org/my/conference?conf=isoes2021) • Final Submissions: Max 6 Pages for Full Papers OR 2 Pages for Extended Abstracts The following types of contributions from students, academic researchers, and practitioners are welcome: original research, pilot and ongoing studies, case studies, thematic literature reviews, dissemination articles, and research protocols. These contributions will be subject to peer review before acceptance. * Check www.isoes.info/ for abstract/paper template and additional information on online attendance and remote presentations.

Industry	Topics	

Aerospace
Agriculture
Automotive
Aviation
Construction
Defense
Electronics
Fishing
Forestry
Health Care
Info Technology
Manufacturing Marine
Mining
Oil and Gas
Office
Retail
Transportation
Utilities
Warehousing
and Others
	Ergonomics & Human Factors
	• Physical
	• Cognitive
	   ○ Perception/Processing/Memory
	   ○ Distraction/Inattention/Boredom
	• Organizational
	• Psychosocial
	Safety & Health
	• Systems/Behavioral
	• Culture/Climate
	• Home
	• Risk Assessment/Management
	• Artificial Intelligence
	• Nano Products/Processes
	• Automated Vehicles/Equipment
	• Robotics/Exoskeletons/Wearables
	• Prevention through Design
	• Virtual/Augmented Reality
	• User Experience/Usability
	• Data Analytics
		Workplace Exposure Examples
		• Aging Workforce
		• Overweight/Obesity
		• Health & Wellness
		• Stress & Fatigue
		• Remote Working
		• Sit vs Stand
		• Vibration Exposure
		   ○ Whole-body & Segmental
		• Slips, Trips, and Falls
		• Repetitive Motion
		• Work Rest Cycles
		• Manual Handling/Overexertion
		• Musculoskeletal Injuries/Disorders
		• Environmental
		   ○ Temperature, Air Quality, Lighting, Noise, Electromagnetic Radiation
		• COVID-19 Best Practices
		• Other Emerging Topics

ISOES 2021 Conference Proceedings will receive a unique DOI (Digital Object Identifier)

Excellence Awards	• ISOES will select up to three **professional (non-student) full papers** to receive a monetary award not to exceed a combined sum of $500. • ISOES will select up to three student full papers, with the student listed as the first author, to receive a monetary award not to exceed a combined sum of $500. • In addition to the monetary award, award recipient(s) will receive an official certificate of recognition and a free two-year membership to ISOES. • Student candidates must be currently enrolled in an accredited university pursuing an undergraduate or graduate degree with an ergonomics or safety focus. • Award recipient(s) will be expected to register and remotely present his/her research at the September 2021 annual conference.

Conference Organization Committee

Clarence Rodrigues (Chair), Gabriel Ibarra-Mejia, James G. Borchardt, Anand Subramanian, Chao Wang, Jaejin Hwang, and Steve Fleming

Abstracts/Papers will be published in the ISOES Conference Proceedings.

Digital Conference Proceedings will be available for download following the conference.

Shuping Xiong
PhD
Korea Advanced Institute of
Science and Technology
International Member at Large

"...construction industry has been identified as one of the most hazardous industries, probably due to the nature of construction projects is dynamic, complex, and temporary."

Comparison of fatal occupational injuries in construction industry in the United States, South Korea, and China
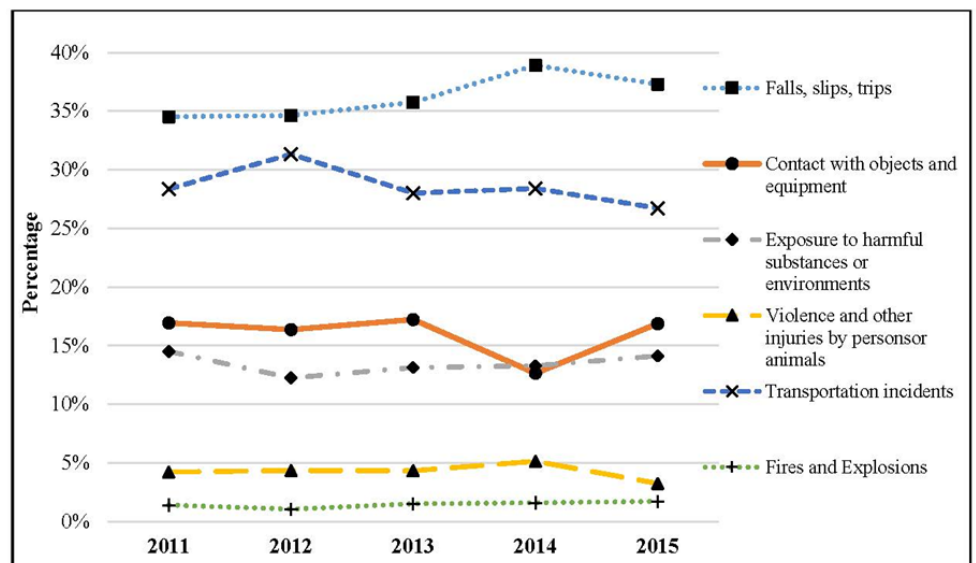
As an important contributor to the economy, the construction industry has grown over the last decades in many countries. Despite its importance, construction industry has been identified as one of the most hazardous industries, probably due to the nature of construction projects is dynamic, complex, and temporary. The relatively high occupational injury and fatality rates in construction have attracted significant attention from researchers, practitioners and government policy makers.

In order to understand country specific similarities and differences in fatality risks of construction industry, we, an international joint research team comprising researchers from three countries (the United States, South Korea, and China), conducted an international comparison study on fatal occupational injuries (FOI) in construction industry in the United States (U.S.), South Korea, and China in the period of 2011-2015. In our study, FOI data were obtained from various public resources and analyzed with statistical analyses. Results showed that the construction industry in all three countries had consistently high FOI and the top common accident types were "fall from a higher level" and "struck by". China recorded the highest average number of FOI in construction of 2328, followed by the U.S. of 881 and South Korea of 533. However, South Korea had the highest average mortality rate of 17.9, followed by the U.S. of 9.4 and China of 5.3. In addition, Poisson regression indicated that the number of FOI of the U.S. increased at an annual rate of 5.8%, whereas China's decreased at 7.1% and South Korea's decreased at 4.9%. The similarities and differences between U.S. and South Korea in workforce profile of FOI were also reported. Implications and recommendation for FOI prevention in construction industry were discussed afterwards. This study was published in International Journal of Industrial Ergonomics (2019, 71: 64–74) and interested readers can refer to this paper for more details.

Although the findings of our study should be interpreted with caution due to probable underreporting of FOI and differences in surveillance systems, the information found in this international comparison on occupational fatal injuries could identify priorities for construction safety research and develop effective regional or global prevention interventions to mitigate the fatalities in the construction industry.

Ergonomics and Safe Patient Handling

Jaejin Hwang
PhD
International Member at Large

Healthcare workers suffer from a high risk of musculoskeletal disorders (MSDs). Low back pain is known as the most common injury type among healthcare workers. Patient handling is one of the main risk factors due to healthcare workers' overexertion and awkward postures (bending, twisting, and reaching) while lifting, repositioning, and transferring the patients. The Safe Patient Handling and Mobility (SPHM) interventions have been set as a priority goal by the American Nurses Association. This intervention includes multifaceted strategies such as the ergonomic use of patient handling equipment and safe methods to handle the patients. Although this intervention was found to be effective in reducing the risk of MSDs, only 11 states in the U.S. had implemented the SPHM program by law. The barriers of adoptions could include the limited equipment availability, space and maintenance issues, time constraints in using the equipment, lack of perceived need, and training of equipment. Not only from the worker-level support but also more support from the healthcare organization levels is needed to implement and sustain the SPHM program over a long period of time. Innovative interventions could be other facilitators to increase the implementation of the SPHM program. Recently, there has been a growing interest in using exoskeletons in healthcare settings. Exoskeleton's portability, low cost, and personalized assistance could be a good supplementary intervention while using the existing patient handling equipment. The feasibility and effectiveness of back-support exoskeletons have been tested in wheelchair-to-bed transfers, prone positioning tasks, and geriatric work. Although the biomechanical benefits of the low back with back-support exoskeletons have been found by recent studies, time constraints in wearing/adjusting the exoskeletons have been found as a concern in real hospital settings. More rigorous studies could be needed to fully understand the potential benefit and unanticipated risks of using exoskeletons and determine best practices while using exoskeletons and patient handling equipment in a patient handling environment.

> *"Exoskeleton's portability, low cost, and personalized assistance could be a good supplementary intervention while using the existing patient handling equipment."*

Wearable Safety and Health Assistive Robot Collaboration for Skilled Construction Workers

Chao Wang
PhD
Member at Large

Currently, construction workers suffer intense physical effort, and serious safety and health risk in hazardous working environments. As a result, construction industry becomes one of the highest-risk private sectors in the US. Shortage of skilled workers brings additional challenges and pressures to construction industry to improve workers' safety and health. Wearable robotic technology provides promising potentials to prevent work-related musculoskeletal disorders, assess and assist physical and fatigue, and learn and train worker skills in construction trades. The research objective of this NSF project is to build a synergistic team and provide symbiotic solutions to develop and deploy wearable safety and health assistive robots for skilled construction workers. The project will enable the development and deployment of personalized wearable assistive robot collaboration for skilled construction workers. The researchers will also develop a number of integrated research and education programs to attract students from underrepresented groups into engineering and involve undergraduate students into research.

Although robotics technologies have been increasingly used in construction applications, most focus on the use of robots to help conduct construction tasks and few discusses the use of industrial exoskeletons for improving workers' safety and health. In this planning project, the team of researchers plan to build a synergistic team and identify potential topics and symbiotic solutions to achieve the above research goal. Specifically, this project will emphasize on: (1) develop light-weight, flexible, high-performance, personalized wearable exoskeletons for construction workers; (2) develop machine learning-based human skill modeling and training in construction, and (3) initiate new cross-disciplinary collaboration and foster engagement with industry partners and stakeholders. The proposed robotic development and pilot study will provide deep understanding of technical and socio-economic challenges for integrating robotic technologies into existing socio-technical ecosystems of work. The planning grant will also study the effects of the significant shifts in human work on individual, organization and industries with a focus specifically on construction work. The ultimate goal of this project is to develop the necessary research personnel, research infrastructure, and foundational work to expand the opportunities for studying future technology, future workers, and future work.