Technology Enhanced WSH Management

**23 March 2018
9am to 6pm
Holiday Inn @
Orchard City Centre
11 Cavenagh Road,
229616,**

Working in certain areas of a workplace or factory can be hazardous. According to the statistics, in the past 5 years, the number of fatalities were in the fifties and sixties across all industries in Singapore. Technology has stepped up to create safety measures and organizations should explore the use of technology to improve the safety and health of workers. This seminar is about the sharing from academia and organizations which have embraced technology to enhance the safety and health of workers. Technology can be a great help in shaping a culture of safety by eliminating hazards or minimizing risk.

Program Highlights:

Using Technology to Accelerate Our Journey to Zero Harm
By: Mr. Lee Brough
Amplifying Human Ingenuity With Intelligent Technology – to create a safer workplace
By: Mr. Richard Koh
Using Computer Vision to Improve Construction Safety – A Case Study
By: Mr. Jeffrey Wijaja Lowardi, Ms. Abinaya Seenivasan, Ms. Khairrunisa Bte Yahya, Mr. Le Trung Hieu
Innovations in Construction Service Robotics
By: Prof. Chen I-Ming, NTU
Managing Safety in Changi Airport Through the Use of Technology
By: Mr. Marken Ang, Changi Airport Group
Developing Safety Leading Indicators for Construction Sites: A Machine Learning Approach
By: Dr. Goh Yang Miang, NUS
Adopting Technologies for Integrated Workplace Safety Management in the Built-Environment
By: Mr. Wilson Cho, FM One Management Pte Ltd

FEES (INCLUDING GST)

$267.50
(IES MEMBERS / CN&L MEMBERS/ CIJC MEMBERS/IOSH MEMBERS)

$$374.50 (NON MEMBERS)

FEES INCLUDE:

- 2 TEA BREAK
- 1 X LUNCH BUFFET
- COMPLIMENTARY PARKING COUPON

CPD PROGRAM :

- STU (Safety) - TBA
- 7 PDUs (For PEs) Approved
- 7 SDUs Approved

GROUP PURCHASE
(INCLUDING GST)

$5350 : 25 Seats
$3370.50 : 15 Seats
$1177 : 5 Seats

USING TECHNOLOGY TO ACCELERATE OUR JOURNEY TO ZERO HARM

Technology-led innovation is in Rolls-Royce's DNA. By investing in tomorrow's technology, continuing to focus on engineering excellence and creating a culture of innovation, Rolls-Royce is shaping the future of power.

In this presentation, we will share an insight into our journey to build a factory of the future by using technology to transform the way we work. Through smart manufacturing processes we're able to reach our goal of zero harm to health, people and the environment faster.

Mr. Lee Brough is Rolls-Royce's Manufacturing Executive for Fan Blade Singapore (FBSG), located at the Rolls-Royce Seletar Campus. The FBSG facility manufactures hollow titanium Wide Chord Fan Blades, a unique technology which has played a key role in the success of the Rolls-Royce Trent aero engine family. At full capacity, the FBSG facility will produce over 8,600 fan blades per year for Rolls-Royce Trent 900, Trent 1000 and Trent XWB engines. These engines power the Airbus A380, Boeing 787 Dreamliner and Airbus A350 XWB respectively and are assembled in Rolls-Royce's engine assembly and test facility, also located within the Seletar Campus.

Mr. Lee is responsible for leading operations within the FBSG facility to ensure safety, strong process compliance and product integrity. He is also focused on taking the facility on a digitalisation journey to develop advanced processes and new manufacturing systems that increase productivity.

AMPLIFYING HUMAN INGENUITY WITH INTELLIGENT TECHNOLOGY – TO CREATE A SAFER WORKPLACE

When you look back at the achievements that have advanced our world, you discover they were all driven by human ingenuity. It's what inspires us to learn. To create. To explore. Human ingenuity is what pushes us to go further and see things differently. Microsoft is driving AI advances in fields including computer vision, speech recognition, machine reading, natural and language processing. Richard, CTO of Microsoft Singapore, will be showing how these intelligent technologies are empowering workplace safety processes

MR. RICHARD KOH, graduated from the National University of Singapore with a Bachelor's of Science in Computer Science & Information Systems, is the chief technology officer of Microsoft Singapore. In this role, he is responsible for engaging with key executive leaders across government, industry and academia; bringing in the macro technology landscape; and helping customers leverage technology innovations for their digital transformation. His focus areas include guiding technology policies, standards, legal and regulatory matters, as well as security, privacy and compliance decisions.

Prior to joining Microsoft, he was the senior director for Emerging Businesses & Strategy under Group Enterprise at Singtel. There, he led a team of intrapreneurs, products managers, product marketers, architects, and engineers to catalyse new businesses, products and platforms in Cloud services, the Internet of Things, machine to machine, education and healthcare.

Earlier on in his career, Richard spearheaded Emerging Markets strategy for Microsoft Operations as the operations team unit lead based in Singapore. And in Redmond, Washington, he led product teams as director of technical product management in Microsoft's Office, Servers & Tools, as well as telecommunication solutions businesses, which led him to be part of the founding product team for Microsoft's flagship productivity suite – Office 365.

USING COMPUTER VISION TO IMPROVE CONSTRUCTION SAFETY – A CASE STUDY

In this presentation, you will be introduced to computer vision and how it can help to solve common workplace safety issues in the construction industry. Using Microsoft Azure and Shimizu's work site as a case study, demonstration will be shown how it can detect the usage of helmet and nearby hazard when machinery is in use. We will also touch on future implementation of computer vision in the construction industry. Lastly, we will end off with what we have learnt and the challenges faced during this project.

Four students from National University of Singapore (NUS)'s School of Computing, and School of Design and Environment will be doing a short presentation on how computer vision can help improve construction safety. The idea of applying computer vision using a local case study was formed when we came across a Workplace Safety Demonstration using Microsoft Azure. We embark on this project in collaboration with Microsoft and Shimizu Corporation Singapore. With this presentation, the team aim to highlight the capability of computer vision and encourage the adoption of computer vision to tackle more complicated workplace safety issues in the future.

INNOVATIONS IN CONSTRUCTION SERVICE ROBOTICS

In this talk, several construction robotics projects carried out in NTU will be introduced, such as High-rise spray painting robot (Pictobot), and Building quality assessment robot (Quicabot). With new actuators, low cost sensors, and open source robotics software, infrastructure robots represent a new breed of intelligent systems that help the society to overcome manpower shortage and ageing workforce issues. These projects are examples of user-led and user-inspired robotics R&D effort led by government agencies, universities, research institutions, and industrial alliance of local and overseas robotics and construction machinery manufacturers, start-up companies, and system integrators. The ultimate goal is to strengthen the robotics R&D capability in Singapore and to foster a robotics industry and the ecosystem that transform Singapore into a Smart Nation.

PROFESSOR I-MING CHEN is an internationally renowned robotics researcher. He received the B.S. degree from National Taiwan University in 1986, and M.S. and Ph.D. degrees from California Institute of Technology, Pasadena, CA in 1989 and 1994 respectively. He has been with the School of Mechanical and Aerospace Engineering of Nanyang Technological University (NTU) in Singapore since 1995. He is currently Director of Robotics Research Centre and also Director of Intelligent Systems Center in NTU. Professor Chen also acts as the Deputy Program Manager of A*STAR SERC Industrial Robotics Program to coordinate project and activities under this multi-institutional program involving NTU, NUS, SIMTech, A*STAR I2R and SUTD. He is a member of the Robotics Task Force 2014 under the National Research Foundation which is responsible for Singapore's strategic R&D plan in future robotics. His research interests are in wearable devices, human-robot interaction and industrial automation. Professor Chen is Fellow of IEEE and Fellow of ASME, General Chairman of 2017 IEEE International Conference on Robotics and Automation (ICRA 2017) in Singapore.

MANAGING SAFETY IN CHANGI AIRPORT THROUGH THE USE OF TECHNOLOGY

The presentation will touch on the background of Changi's developmental works highlighting the different kind of works and how we managed safety from the start. The presentation will then touch on our challenges and how we evolved our theoretical model for safety oversight. The presentation will also talk about our journey in managing and countering risks in Changi Airport through the implementation of various controls measures including leveraging on latest technology. Lastly, the presentation will talk about the results and achievements of our efforts so far.

MR. MARKEN ANG SZE CHING is an Associate General Manager with the Changi East Safety Team. He has a BEng (Hons) in Electronics & Electrical Engineering from the University of Salford (United Kingdom) and a MSc in Safety Health & Environmental Technology from the National University of Singapore. Marken brings with him more than a decade of WSH experience and prior to joining Changi Airport Group, Marken had served in various positions in the Ministry of Manpower and Keppel Group. Having worked with both public and private organizations on WSH & HSE matters, Marken is equipped with a balanced viewpoint of practical safety which translate into safe production. Marken understands the WSH requirements of the law having led a team of inspectors covering general factories to construction projects. He has also investigated fatal incidents and dangerous occurrences where organizations were successfully prosecuted due to contravention of WSH laws and requirements.

DEVELOPING SAFETY LEADING INDICATORS FOR CONSTRUCTION SITES: A MACHINE LEARNING APPROACH

The construction industry is one of the most dangerous industries internationally. To improve the situation, senior managers overseeing portfolios of construction projects need to understand the safety risk levels of their projects so that interventions can be implemented proactively. Safety leading indicators is one way to flag sites that are of higher risk. However, there is a lack of validated leading indicators that can reliably classify sites according to their safety risk levels. On the other hand, despite the success of machine learning (ML) approaches in other domains, it is not widely utilized in the construction industry, especially in the development of safety leading indicators. This paper presents a ML approach to developing leading indicators that classify sites in accordance to their safety risk in construction projects. This study was guided by the industry-recognized Cross-Industry Standard Process for Data Mining (CRISP-DM) framework and the key types of data used include safety inspection records, accident cases and project-related data. These data were obtained from a large contractor in Singapore and the data were accumulated from year 2010 to 2016. Out of thirty-three input variables (also known as features or independent variables), 13 input variables were selected using a combination of Boruta feature selection technique and decision tree. Five popular machine learning algorithms were then used to train models for prediction of accident occurrence and severity. During validation, Random Forest (RF) provided the best prediction performance. The prediction provided by the RF model can be used as a safety leading indicator of the risk level of a site. It is recommended that the predictive RF model be deployed in construction organizations, especially large public and private developers, contractors and industry associations, to provide monthly forecast of project safety performance, so that pre-emptive inspections and interventions can be implemented in a more targeted manner.

DR GOH YANG MIANG is an Associate Professor with the National University of Singapore. He currently leads the Safety and Resilience Research Unit (SaRRU) in the Centre for Project Management and Construction Law. At the same time, he is the Deputy Head (Research) in the Department of Building, NUS. Dr Goh specialises in Workplace Safety and Health (WSH) and risk management. He is appointed as an Honorary Researcher of the Workplace Safety and Health Institute in Singapore (2014-2017). He worked as a senior consultant in the oil and gas industry, Assistant Director (Investigations) at the Singapore Ministry of Manpower, and Senior Lecturer at Curtin University in Western Australia. Dr Goh is an approved Workplace Safety and Health Auditor. He was also a Council Member of the Institution of Engineers Singapore (IES) (2015-2017) and currently co-chairs the IES Health and Safety Engineering Technical Committee.

ADOPTING TECHNOLOGIES FOR INTEGRATED WORKPLACE SAFETY MANAGEMENT IN THE BUILT-ENVIRONMENT

The landscape of workplace management has been changing rapidly with the emerging set of technologies like the Internet-of-Things (IoT). More organisations are now pushing for digital transformation and automation to improve workplace efficiency, productivity, flexibility and mobility. These technology-driven workplace changes will continue to spread and accelerate at a rapid pace in future. This workshop provides an overview of the benefits and impact of such workplace trends and the potential applications in the integrated workplace safety management domain.

MR. WILSON CHO is a spring-certified practising management consultant and crisis management certified expert with over 20 years of experience covering the construction, financial, oil & gas and built-environment industries in Asia Pacific.
He has established FM One Management Pte Ltd, a company that offers innovative solutions to digitize, converge and to simplify management of living and working space, with a vision to be the leading and preferred provider for Internet-of-Everything (IoE).

He has led the successful implementation of multi-million complex intelligent building management and global security system projects as well as the development and implementation of integrated safety app solutions and management programmes.

Mr. Cho is a management committee member of the Singapore Fire Safety Managers' Association Singapore and the past Professional Development Chairman of International Facility Management Association (Singapore Chapter).

Registration

1. Registration is based on first come first served. Please click HERE for registration

2. For Group Purchase, please click HERE

3. Registration through phone is strictly **NOT** allowed.

Payment Mode

1. Payment via VISA/Master online

2. Payment via AXS Machine (Please click HERE for procedure). Remember to retain your receipt for verification.

3. Payment by Crossed Cheque payable to "**IES**"

*For cheque payment, please indicate Participate name & Event name at the back of the cheque and send to:

The Institution of Engineers, Singapore
70 Bukit Tinggi Road
Singapore 289758
Attn: Shelly Ng
Confirmation of Course

Confirmation of registration will be given 5 days prior to the commencement date of event via email. Otherwise, please call Ms Shelly Ng @ 6461 1222 to check on your confirmation.

(Please remember to check your Junk/Spam folder if you did not receive the confirmation)

Cancellation

In the event that participants are not able to attend, please inform us in writing **at least 5 working days** before the event date. Otherwise **full payment** is still applicable even if you did not turn up for the talk.

(Please be informed that there will be a cancellation charge of 4.5% if cancelled by participant)