WORLD ENGINEERS SUMMIT 2023

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8 – 10 November 2023
Marina Bay Sands, Singapore
Orchid Ballroom (Level 4)

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WELCOME MESSAGE BY CONFERENCE CHAIR

Welcome Message

Er. A/Prof Lim Kok Hwa
Chairman of World Engineers Summit (WES) 2023

Dear distinguished guests and WES 2023 delegates,

I am pleased to invite you to join us at the World Engineers Summit (WES) 2023 to be held from 8 to 10 November 2023 in Singapore.

Since its inception in 2013, the biennial World Engineers Summit has built a strong reputation for its excellence in promoting the exchange of ideas, knowledge, experience and expertise to support sustainable urban development.

As the world continues to strive for recovery in the post-pandemic era, it has become more important than ever for engineers to come together and identify ways to realise pledged commitments to net-zero targets and create a more resilient future.

Against this backdrop, we have chosen "Engineering for a Sustainable Future" as the theme of WES 2023. The summit will address pressing issues facing us today while stimulating new growth opportunities across various disciplines, industries and countries.

We have designed the programme to optimise opportunities for delegates to gain new perspectives, resources and networks to inspire greater advancements in their work. The technical programme is rich and varied with keynote speeches, plenary presentations and panel discussions.

WES 2023 will be delivered across six curated tracks: Sustainable through Technology, Building a Resilient Future against Climate Change, Future of Industry Sustainability, Smart and Sustainable Urban Mobility, A Greener and Renewable Built Environment, and Pedagogy and Education Technology in Engineering Education.

I would like to thank all plenary speakers and presenters for your valuable contributions; and the organising committee and the IES Secretariat for your dedication to make this year's WES the best one ever.

I look forward to seeing all of you at WES 2023!

WELCOME MESSAGE BY PRESIDENT

Welcome Message

Mr Dalson Chung
President of The Institution of Engineers, Singapore

Dear IES Members, conference delegates and friends,

On behalf of The Institution of Engineers, Singapore (IES), I would like to invite you to attend the World Engineers Summit (WES) 2023.

As the threat of climate changes continues to escalate, the time to take bold action to mitigate its impact is now. All around the world, climate programmes are continuing to emerge with goals to increase usage of renewable energy, maximise resource efficiency, build low-carbon cities, switch to sustainable transport, protect biodiversity and more. All these efforts require the full support of engineers to create innovation solutions to enable the pathway to a net-zero future.

Under the theme "Engineering for a Sustainable Future", WES 2023 will provide a valuable platform for the international community of engineers, scientists, academics, business leaders, policymakers and researchers to exchange ideas and insights to drive quicker and greater creation of innovations to accelerate the world's transformation in sustainable development.

IES is excited to once again host the biennial summit in Singapore, as it is a crucial part of the IES Green Plan 2030. Launched in January 2023, the plan aims to provide national-level institutional support to advance Singapore's sustainable development imperative. It lays out concrete engineering-centric action plans from 2023 to 2030 to support the Singapore Green Plan 2030.

We are deeply honoured to have Mr Teo Chee Hean, Senior Minister and Coordinating Minister for National Security, Singapore as the guest-of-honour of the WES 2023 opening ceremony and Mr Chee Hong Tat, Acting Minister for Transport and Senior Minister of State for Finance for gracing the conference dinner.

I would like to extend our deepest appreciation to the plenary speakers, supporting partners, sponsors, delegates, organising committee and the IES Secretariat for lending wonderful support to make this event possible.

Together as a global engineering community, let us turn climate ambition into action and come together to build a climate-resilient, sustainable future.

I wish all attendees a rewarding experience at WES 2023.

ACKNOWLEDGEMENT OF SPONSORS

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Ms Jasmine Foo

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Dr Teo Tee Hui

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Er. A/Prof Lim Kok Hwa
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Secretariat

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Shelly Ng

DAILY PROGRAMME LINE-UP

Date	Time	Programme Description	Venue
8 November 2023, Wednesday	10.00am – 1.00pm	WES Opening Ceremony & Plenary Session	Orchid Ballroom Marina Bay Sands
	2.00pm onwards	Track Break-out Sessions (Please refer to paper schedule)	Orchid & Melati Ballroom Marina Bay Sands
9 November 2023, Thursday	9.00am onwards	Track Break-out Sessions (Please refer to paper schedule)	Orchid Ballroom Marina Bay Sands
	6.00pm onwards	WES 2023 Conference and IES 57th Annual Dinner	Marina Bay Sands Grand Ballroom, Level 5
10 November 2023, Friday *Optional Activities - additional charges apply*	10.00am – 12.00pm	Technical Site Visit: Sustainability Technology Center (STC), Danfoss Singapore	
	2.00pm – 4.00pm	Technical Site Visit: Emerson Digital Plant Experience	
	2.00pm – 4.00pm	Technical Site Visit: Sembcorp Tengeh Floating Solar Farm	
	4.00pm – 6.00pm	Technical Site Visit: Gardens by the Bay	

Important Note:

- Information is correct at time of print. Please proceed to the Registration Counter for announcement or updates in the programme.
- All participants are required to sign in and out with Registration desk on each Conference Day to receive their relevant CPD/PDU points.

OPENING CEREMONY PROGRAMME

Date	Time	Programme
08 November 2023	8.00am	Registration
	8.45am	Guests to be seated
	9.00am	**Arrival of Guest-of-Honour** Mr Teo Chee Hean Senior Minister and Coordinating Minister for National Security, Singapore
	9.05am	**Welcome Address by WES 2023 Conference Chair** Er. A/Prof Lim Kok Hwa
	9.10am	**Remarks by WES 2023 Strategic Partner, China Society of Engineers** Ms Luo Hui Member of the Leading Party Members Group, Director General of Department of International Affairs, China Association of Science and Technology (CAST) Joint Secretary-General, Chinese Society of Engineers (CSE)
	9.20am	**Speech by Guest-of-Honour** Mr Teo Chee Hean Senior Minister and Coordinating Minister for National Security, Singapore
	9.30am	**Launch of World Engineers Summit (WES) 2023**
	9.35am	***Re-imagineers of our Net Zero Future*** Dr Steve Howard Vice Chairman, Sustainability, Temasek
	10.05am	**Morning Tea Break**
	10.30am	***Sustainability – Research and Translation for a resilient Singapore*** Prof Low Teck Seng Senior Vice President (Sustainability and Resilience) National University of Singapore
	11.00am	***Building a Green Land Transport Ecosystem*** Mr Lam Wee Shann Deputy Chief Executive (Technology) / Chief Technology Officer Land Transport Authority
	11.30am	***Hong Kong's Roadmap to Carbon Neutrality*** Prof Wang Tianyi Professor at Hong Kong University of Science and Technology (Guangzhou) Former Chairman & CEO of China Everbright Environment Group
	12.00pm	**Panel Discussion** **Moderator:** Prof Sreeram Ramakrishna Chief Editor of Materials Circular Economy I Associate Editor of Circular Economy Department of Mechanical Engineering, College of Design and Engineering National University of Singapore **Panelists:** 1. Prof Low Teck Seng 2. Mr Lam Wee Shann 3. Prof Wang Tianyi
	12.30pm	**Lunch Reception**
	2.00pm – 6.00pm	**Presentation of Tracks** • Sustainability through Technology • Building a Resilient Future against Climate Change • Future of Industry Sustainability • Smart and Sustainable Urban Mobility • A Greener and Renewable Built Environment • Pedagogy and Educational Technology in Engineering Education

Please note the programme schedule is tentative and subjected to further changes

TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 1 - Sustainability Through Technology		
Track	**Timing**	**Author**
1	2.00pm – 2.20pm	**Keynote Presentation 1:** **Smart Cities in Indonesia: Implementation and Challenges** by Prof. Dr Suhono Harso Supangkat Director Smart Cities and Communities Innovation Center
1	2.20pm – 2.40pm	**Paper Presentation 1:** **Achieving Net-Zero Through Partnerships & Technology** by Mr Manuel Ong Danfoss Singapore Pte Ltd
1	2.40pm – 2.55pm	**Paper Presentation 2:** **Embodied Carbon calculation using Computational Tools** by Gavin Chan and Lin Zhenyi CPG Corporation
1	2.55pm – 3.10pm	**Paper Presentation 3:** **Towards Sustainable 2D Semiconductor Electronics Technology** by Ang Yee Sin and Tan Chuin Wei Singapore University of Technology and Design
1	3.10pm – 3.40pm	**Panel Discussion**
1	3.40pm – 4.00pm	***Tea Break***
1	4.00pm – 4.20pm	**Keynote Presentation 2:** **Gardens by the Bay: A Green Marvel of Sustainability** by Mr Felix Loh Chief Executive Officer Gardens by the Bay
1	4.20pm – 4.35pm	**Paper Presentation 4:** **Cranfield University: Hyper Project Clean Hydrogen & Carbon Capture** by Jeff Obbard Cranfield University *Presented by: Chris Fogwill*
1	4.35pm - 4.50pm	**Paper Presentation 5:** **Development of a Smart and Lean Pick-and-Place Solution with Optimisation of Hyperparameter and Image Properties** by Elven Kim, Chong Jun Jiex, Choong Zi Jie and Michael Lau Newcastle University
1	4.50pm - 5.05pm	**Paper Presentation 6:** **I.M.P.R.E.N.T.A. - Innovative Machine for PET Bottle Recycling Extruding using Nature Caring Technology and Assembly** by Gerhard Tan, Asley Arviola, Jaiko Riel Bendo, Von Jonnell Bernal, Karen Mira Lea Cabanela, Ana Rose Gonzales, John Lhouwell Labastida, Norman Ortiz, Mariam Jamilah Rojas, Earl John Villaluz and Raymond Paiton Polytechnic University of the Philippines
1	4.50pm - 5.05pm	**Paper Presentation 7:** **Maximizing Piezoelectric Energy Harvesting: Overcoming Challenges and Unlocking Sustainable Power Generation** by Sim Hwa San, Samson Chang, Teo Boon Ping, Pradeepkumar Krishnamoorthy, Ng Chun Kee and Lim Lian Hock ITE
1	5.05pm - 5.20pm	**Paper Presentation 8:** **High Energy Laser Weapon Systems** by Wilbur Chan Singapore University of Social Sciences
1	5.20pm - 6.00pm	**Panel Discussion**

"For the latest copy of programme schedule, please visit our website at www.wes-ies.org/registration-ies/programme/."

TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 2 - Building A Resilient Future Against Climate Change		
Track	**Timing**	**Author**
2	2.00pm – 2.20pm	**Keynote Presentation 1:** **Integrated Solutions for Coastal Protection, Flood Control, Clean Water and Space** by Prof Chu Jian Chair, School of Civil and Environmental Engineering President's Chair in Civil Engineering Professor, School of Civil and Environmental Engineering, Nanyang Technological University
2	2.20pm – 2.40pm	**Keynote Presentation 2:** **Singapore Green Building Masterplan: A Roadmap to Decarbonise the Built Environment** by Dr Edward Ang Director, Green Building Policy and Technology Department, Environmental Sustainability Group Building and Construction Authority
2	2.40pm – 2.55pm	**Paper Presentation 1:** **Design of Climate Resilient Urban Residential Estate with a Modular Farmscape** by Soh Chew Beng, Chien Szu-Cheng, An Hui, Ang Ting Wei Barbara and David Tan Singapore Institute of Technology
2	2.55pm – 3.10pm	**Paper Presentation 2:** **Comprehensive Defect Inspection of Building Façades Using Convolutional Neural Networks** by Zhou Xiaoling, China Singapore International Joint Research Institute & Robert Tiong L. K., Nanyang Technological University
2	3.10pm – 3.40pm	**Panel Discussion**
2	3.40pm – 4.00pm	***Tea Break***
2	4.00pm – 4.15pm	**Paper Presentation 3:** **Building a Resilient Future against Climate Change - The Fastest Path to Net Zero** by Wei Linyun Schneider Electric
2	4.15pm – 4.30pm	**Paper Presentation 4:** **Circular Cities: Towards Climate-Resilient Urban Built Environment** by Haziqah Saini AECOM Singapore Pte Ltd
2	4.30pm – 5.00pm	**Panel Discussion**

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TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 3 - Future of Industry Sustainability		
Track	**Timing**	**Author**
3	2.00pm – 2.20pm	**Keynote Presentation 1:** **Next Generation Solutions & Technologies to Enable Green Transformation in Chemical Industry** by Dr Ronny Sondjaja Vice President - Asia Pacific, Research, Development & Innovation, Evonik SEA Pte Ltd
3	2.20pm – 2.40pm	**Keynote Presentation 2:** **Industry Sustainability 1 2 3 4** by Er. Lucas Ng Senior Advisor Head, Sustainability PCS Pte. Ltd.
3	2.40pm – 2.55pm	**Paper Presentation 1:** **Novel Machine Learning Based Technique for Energy Forecasting in Industries** by Venkat Subramanian Arumuga Perumal and June Tay Singapore University of Social Sciences
3	2.55pm – 3.40pm	**Panel Discussion**
3	3.40pm – 4.00pm	***Tea Break***
3	4.00pm – 4.15pm	**Paper Presentation 2:** **The Practice and Assessment of Sustainable Manufacturing** by F. C. Yee, Singapore Institute of Technology and Raimund Klein, International Centre for Industrial Transformation
3	4.15pm – 4.30pm	**Paper Presentation 3:** **Energy Efficiency Retrofit Options for Existing Data Centers in Singapore** by Joe Ong RED APAC
3	4.30pm – 4.45pm	**Paper Presentation 4:** **Future of Industry Sustainability** by Cindy Koh AECOM Singapore Pte Ltd
3	4.45pm – 5.00pm	**Paper Presentation 5:** **Development of Transport Scenarios and a Cycling Simulator in Virtual Reality** by Adriel Yeo, Benjamin Kwok, Jeannie Lee, Koh Guo Xun, Ryan Tan, Krystal Yamin, Liew Yeni, Derwin Yan & Wong Zi Feng Singapore Institute of Technology
3	5.00pm – 5.30pm	**Panel Discussion**

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TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 4 - Smart and Sustainable Urban Mobilty		
Track	**Timing**	**Author**
4	2.00pm – 2.20pm	**Keynote Presentation 1:** **The Journey toward Meta Factory** by Mr Jung Hong Bum, Joseph Chief Executive Officer, Hyundai Motor Group Innovation Center, Singapore (HMGICS)
4	2.20pm – 2.40pm	**Keynote Presentation 2:** **Reimagining Urban Life: Exploring Innovations in Urban Mobility for a Sustainable Future** by A/Prof Yap Fook Fah Co-Director, Transport Research Centre@NTU Nanyang Technological University
4	2.40pm – 2.55pm	**Paper Presentation 1:** Prioritizing safety: pathway to sustainability in Singapore by Dr Koh Puay Ping and Chandrasekar Land Transport Authority
4	2.55pm – 3.10pm	**Paper Presentation 2:** **Smart Urban Mobility Masterplan for Baguio City** by Leong Hin Cheong ST Engineering
4	3.10pm – 3.25pm	**Paper Presentation 3:** **Realising an Inclusive and Sustainable Rapid Transit System Through Standardisaton and Standards Development** by Yuan Wang Looi, Zhou Yi, Chan Cheok Ng, Kwok Weng Leong and Richard Kwok SMRT Trains
4	3.40pm – 4.00pm	***Tea Break***
4	4.00pm – 4.20pm	**Keynote Presentation 3:** **Active Mobility in Singapore** by Mr Kenneth Wong Deputy Group Director, Active Mobility, Land Transport Authority
4	4.20pm – 4.35pm	**Paper Presentation 4:** **Battery Charging Framework for Commercial Deones (UAV), Mobile Robots and Automated Fuilded Vehicles (AGV)** by June Tay and He Yihong Singapore University of Social Sciences
4	4.35pm – 4.50pm	**Paper Presentation 5:** **Engineering Sustainable Mobility through Electric-Mobility-as-a-Service** by Chen Xinwei, Toh Boon Cheong & Tan Kian Heong Strides Frontier
4	4.50pm - 5.05pm	**Paper Presentation 6:** **Jobs-Skills Insights for Deployment of Electric Vehicle (EV) Charger** by Tham Jia Yi IES
4	5.05pm - 5.20pm	**Paper Presentation 7:** **Converting a Conventioanl Bus Fleet to Electric Bus Fleet: Experience from the National University of Singapore** by Ong Ghim Ping and Kok Jia Pei Priscilla National University of Singapore
4	5.20pm - 5.35pm	**Paper Presentation 8:** **Greener Strain Hardening Cementitious Composite Material for Sustainable and Resilient Road** by Ali Arto Bawono, Bernard Lechner and Yang En-Hua National Technological University and Technical University of Muni
4	5.05pm – 5.30pm	**Panel Discussion**

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TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 5 - A Greener and Renewable Built Environment		
Track	**Timing**	**Author**
5	2.00pm – 2.20pm	**Keynote Presentation 1:** **Using Low-Carbon Concrete Technologies to Reduce Embodied Carbon** by Dr Wang Su Senior Scientist
5	2.20pm – 2.40pm	**Keynote Presentation 2:** **Redefining the Future of Built Environment: Innovating with Purpose** by Mr Eric Soh CEO Samwoh Corporation Pte Ltd
5	2.40pm – 2.55pm	**Paper Presentation 1:** **Transformation of AMP Centre, Australia's with a Design Life Extension of 50 Years** by Neil Gunn, Reza Hassani and Andi Tjong BG&E Consulting Engineers Pte Ltd
5	2.55pm – 3.10pm	**Paper Presentation 2:** **Sustainable Construction of Foundation In Marine Environment for Johor-Singapore Rapid Transit System (RTS) Link Bridge** by Ng Pin Yuan, Ng Chew Chiat, Foong Choon Who, Ong Chee Wee, Low Hin Foo, Katherine Wong Li Ying & Sii One Smart Engineering Pte Ltd
5	3.10pm – 3.40pm	**Panel Discussion**
5	3.40pm – 4.00pm	***Tea Break***
5	4.00pm – 4.15pm	**Paper Presentation 3:** **A Greener and Renewable Built Environment: Advancing Sustainable Energy Solutions in Singapore through JTC's SolarLand Phase 1 and Phase 2 Projects** by Toh Kai Wei by Terrenus Energy Cerys Ng, JTC Corporation
5	4.15pm – 4.30pm	**Paper Presentation 4**: **Sembcorp's first solar farm at Tuas with an integrated rainwater harvesting system in Singapore through JTC's SolarLand Phase 3 project** by Franco Lim, Sembcorp Kevin Emanuel Suhartono, JTC Corporation
5	4.30pm – 4.45pm	**Paper Presentation 5:** **Understanding Demand for Project Manager Competencies in the Singapore Construction Industry: Data Mining Approach** by Chen Chen, Song Ern Foo, Woo Bin Lee, Qing Zheng and Lee Kong Tiong
5	4.45pm – 5.30pm	**Panel Discussion**

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TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 6 - Pedagogy and Educational Technology in Engineering Education		
Track	**Timing**	**Author**
6	2.00pm – 2.20pm	**Keynote Presentation 1:** **Excellence in Engineering Education: Empowering Next-Generation Innovators** by Mr Loh Yew Chiong Deputy Principal (Academic)
6	2.20pm – 2.40pm	**Keynote Presentation 2:** **Engineering Education: Leveraging Technology for Pedagogy Transformation** by Prof Lock Kai Sang Professor (Engineering), Singapore Institute of Technology Executive Chair, Washington Accord
6	2.40pm – 2.50pm	**Paper Presentation 1:** **Enhancing Students' Learning Experience in Chemical Bonding using Data-enabled Flipped Learning** by Tan Tiong Wei, Chan Chung Hou and Wee Xi Kai Singapore Polytechnic
6	2.50pm – 3.00pm	**Paper Presentation 2:** **Fostering a Collaborative Mindset: A Case Study on Team-Based Learning in a Micro Module on Data and Sustainability** by Wee Kin Guan Singapore Polytechnic
6	3.00pm - 3.10pm	**Paper Presentation 3:** **Use of AR in Wafer Fab Lab** by Allan Wong Singapore Polytechnic
6	3.10 pm - 3.20pm	**Paper Presentation 4:** **Designing a Virtual Digital Teacher for Engineering Education: Challenges and Opportunities** by Dr Deepak Waikar IEEE Education Society Singapore Chapter
6	3.20pm – 3.30pm	**Paper Presentation 5:** **A Three-Year Study Across Two Modules on the Use of an Enhanced Question Generation Approach for Active Learning and Authentic Assessment With Peer Learning** by Tay En Rong Stephen National University of Singapore
6	3.30pm – 3.40pm	**Panel Discussion**
6	3.40pm – 4.00pm	***Tea Break***
6	4.00pm - 4.10pm	**Paper Presentation 6:** **Engaging Minds and Empowering Learners through non-immersive and immersive technology** by Tan Yen Ling, Chia Fu Siong and Tan Tuan Lin Singapore Polytechnic
6	4.10pm - 4.20pm	**Paper Presentation 7:**
6	4.20pm - 4.30pm	**Paper Presentation 8:** **IES Skills Development Partner Programme** by Tham Jia Yi IES

TRACK PROGRAMME

Date : 8 November 2023, Wednesday
Time : 2.00pm - 5.40pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

6	4.30pm - 4.40pm	**Paper Presentation 9:** **Use of Padlet as an online collaboration tool in a graduate civil engineering course** by Kevin Kuang National University of Singapore
6	4.40pm - 4.50pm	**Paper Presentation 10:** **Evidence-Based Reflective Practice to Help Engineering At-Risk Students in Supplementary Lesson Context** by Leong Ying-Wei Singapore Polytechnic
6	4.50pm - 5.00pm	**Paper Presentation 11:** **Addressing the UN SDGs through social innovation and engineering solutions: The experience of a young, applied learning university** by Intan Azura Mokhtar Singapore Institute of Technology
6	5.00pm - 5.10pm	**Paper Presentation 12:** **Fostering Sustainability Education in Civil Engineering through Student-Guided Design Competitions** by Du Hongjian National University of Singapore
6	5.10pm – 5.20pm	**Paper Presentation 13:** **Enhancing the Teaching and Learning of Chemical Process Operation Skills using Educational Technology** by Oh Ai Ye, Koh Hong Wee, Ting Kok Eng, Jin Kai, Lee Fook Choon and Zaidi Ahmad Singapore Polytechnic
6	5.20pm – 5.40pm	**Panel Discussion**

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TRACK PROGRAMME

Date : 9 November 2023, Thursday
Time : 9.00am - 5.30pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 5 - A Greener and Renewable Built Environment		
Track	**Timing**	**Author**
5	1.30pm – 1.50pm	**Keynote Presentation 1:** **Enhancing Infrastructure and Utility Planning in Singapore** by Dr Goh Kok Hun Group Director Urban Redevelopment Authority
5	1.50pm – 2.10pm	**Keynote Presentation 2:** **Cultivating a Sustainable Work Ecosystem for a Greener and Renewable Built Environment** by Mr Lim Eng Boon Deputy Director (Projects) Hwa Seng Builder Pte Ltd
5	2.10pm – 2.25pm	**Paper Presentation 1:** **Design for a Net Zero World** by Professor Tai Lee Siang Singapore University of Technology and Design
5	2.25pm – 2.40pm	**Paper Presentation 2:** **Trends and Applications of Surface Treatment Systems using Laser: Use Case** by Sanjay Kumar Thakura, Kintsugi Consultancy, Singapore Ronald Rudolph and Donald Deptowicz, Aspen Hybrid Technology Solution, USA, and Aspen Laser Dubai, Dubai Gerald Mearini, Genvac Aerospace Inc., USA and Richard Cottrill, Rilltech Racing, USA
5	2.40pm – 2.55pm	**Paper Presentation 3:** **Tooling Applications for Maintenance Efficiency and Sustainability: Use Cases** by Sanjay Kumar Thakura, Kintsugi Consultancy, Singapore, Donald Deptowicz, Aspen Hybrid Technology Solution, USA and Jake Merrick, Merrick Tool, USA
5	2.55pm – 3.10pm	**Paper Presentation 4:** **Prepare for Uncertainty with Certainty—Resilience Design in Buildings and Civil Engineering Works** by He Jing China Institute of Building Standard Design & Research Co., Ltd.
5	3.10pm – 3.25pm	**Paper Presentation 5:** **Challenges and System Solutions for Large Scale Deployment of Renewable Energy in the Context of Carbon Neutrality** by Prof Lu Xi Institute for Carbon Neutrality Tsinghua University, Beijing
5	3.25pm – 3.40pm	**Paper Presentation 6:** **CNEST and a Carbon Measurement Technology** by Prof Wang Zhe Institute for Carbon Neutrality Tsinghua University, Beijing
5	3.40pm – 4pm	**Panel Discussion**
5	4:00 PM	***Tea Break***

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TRACK PROGRAMME

Date : 9 November 2023, Thursday
Time : 9.00am - 5.30pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 6 - Pedagogy and Educational Technology in Engineering Education		
Track	**Timing**	**Author**
6	9.00am – 9.20am	**Keynote Presentation 1:** **Sustainable Development through Education** by A/Prof Dr Ethan Chong Yih Tng Head of Sustainability (Education & Research), Provost Office Singapore Institute of Technology
6	9.20am – 9.30am	**Paper Presentation 1:** **Empowering Education: Integrating Applied Research in Microgrid, Multi-Energy Systems, and Energy Storage into Classroom Teaching and Student Projects With Peer Learning** by Elsa Feng Xue Singapore Institute of Technology
6	9.30am – 9.40am	**Paper Presentation 2:** **Moving from Didactic Instruction to Collaborative Learning, Mediated by Multiple Interactive Screen Technology: Case Study of a Thermodynamics Module** by Xiong Junying and Lim Gaik Bee Ngee Ann Polytechnic
6	9.40am – 9.50am	**Paper Presentation 3:** **Enabling Meaningful Learning: Development of an Engineering Module using LXD Methodology** by Edwin Foo, Zhao Meijun, Flex Tio and Kwek Siew Wee Nanyang Polytechnic
6	9.50am – 10.00am	**Paper Presentation 4:** **Sustainable Industrial Collaboration for Authentic Learning** by Soh Kim Fai Singapore Polytechnic
6	10.00am – 10.30am	**Panel Discussion**
6	10.30am – 11.00am	**Tea Break**
6	11.00am – 11.10am	**Paper Presentation 5:** **Active Learning and Community Engagement in Teaching Sustainability to Engineers** by Tan Mei Xuan and Lynette Cheah Singapore University of Technology and Design
6	11.10am – 11.20am	**Paper Presentation 6:** **Authentic and Applied Learning - Supported by Virtual AI Tutor** by Rendell Tan Singapore Institute of Technology
6	11.20am – 11.30am	**Paper Presentation 7:** **Sustainability in Engineering Education: A Paradigm Shift with Transfer-of-Learning and Authentic Assessment** by Alfred Tan, Christian Della, Jamil Jasin, Idris Lim Li Hong, Ong Chee Ming, Victor Wang Peng Cheng, Arturo Molina-Cristobal and Eve Shavrina Singapore Institute of Technology
6	11.30am – 11.40am	**Paper Presentation 8:** **Reflections on the Use of Learning Analytics for Differentiated Instruction in the STEM Classroom** by Adeline Koh, Adrian Elangovan, Sim Guek Eng, Morganavel Selvarajoo and Peter See Singapore Polytechnic

TRACK PROGRAMME

Date : 9 November 2023, Thursday
Time : 9.00am - 5.30pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

6	11.40am – 11.50am	**Paper Presentation 9:** **The Role of Deliberate Practice** by Leong Mun Kin, Solo Chulawi and Siti Syafiqah Singapore Polytechnic
6	11.50am – 12.30pm	**Panel Discussion**
6	12.30pm – 1.30pm	***Lunch***
6	1.30pm - 1.40pm	**Paper Presentation 10:** **Enriching Engineering Education: Hands-On Learning for Sustainable Energy Solutions** by Lee Chee Huei, Kwan Wei Lek, Apple Koh Li Ling, Massimiliano Colla and Maggie Pee Gim-Yang Singapore University of Technology and Design
6	1.40pm - 1.50pm	**Paper Presentation 11:** **Building Industry & Learning Institutes Partnerships: SoC Industry Now Curriculum** by Vernon Tan, Alvin Tang, Chee Seong Tan, Hu-Shien Tan, John Ng and Shirley Ngiam Singapore Polytechnic
6	1.50pm - 2.00pm	**Paper Presentation 12:** **Infusing Productive Failure in Engine Room Simulation Course for Marine Engineers** by David Bernard Kim Seng Tay and Hong Lin Liew Singapore Polytechnic
6	2.00pm – 2.10pm	**Paper Presentation 13:** **Enhancing STEM Education through Virtual Labs and Game-based Self-Directed Learning: Learning Experiences from Engineering Education** by Lau Zirui and Andy Lee Ngee Ann Polytechnic
6	2.10pm - 2.20pm	**Paper Presentation 14:** **Incorporating Case-based Learning Elements in an Engineering Mathematics Module** by Lai Say Beng, Lim Pei Chin, Quek Kai Leong, Chin Li Cheong, Sharon Quek and Huang Hongying Singapore Polytechnic
6	2.20pm – 2.30pm	**Paper Presentation 15:** **Enhancing Peer Learning in Engineering Education through Integrated Educational Technologies** by Soon Hock Wei and Banu Jaseema Ngee Ann Polytechnic
6	2.30pm - 2.40pm	**Paper Presentation 16:** **Mathematics in Engineering: Elevating Students' Appreciation through Real-World Applications** by Lu Qingyang Singapore Polytechnic
6	2.40pm - 2.50pm	**Paper Presentation 17:** **Using HoloLens in Physics Teaching and Learning** by Chang Sheh Lit and Andreas Dewanto Singapore Polytechnic

TRACK PROGRAMME

Date : 9 November 2023, Thursday
Time : 9.00am - 5.30pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

6	2.50pm - 3.00pm	**Paper Presentation 18:** **Project Based Learning in Undergraduate Robotics Education Using a Robot Simulation Platform** by He Yihong and June Tay Singapore University of Social Sciences
6	3.00pm – 3.30pm	**Panel Discussion**
6	3.30pm – 3.45pm	***Tea Break***
6	3.45pm - 3.50pm	**Paper Presentation 19:** **Enhancing Academic Engagement using Team Based Learning in a Blended Learning Environment** by Handojo Djati Utomo Singapore Polytechnic
6	3.50pm - 4.00pm	**Paper Presentation 20:** **Technological Integration and Authentic Learning: Enhancing Quality and Productivity Management Education for Engineering** by Alexander Lin, Shi Anqi and Tay En Rong Stephen National University of Singapore
6	4.00pm - 4.10pm	**Paper Presentation 21:** **Empowering Educators: A Self-Directed Learning Dashboard for Lecturers** by Ng Geok Ling Singapore Polytechnic
6	4.10pm - 4.20pm	**Paper Presentation 22:** **Leveraging Experiential Learning and Industry Partnerships For Holistic Upskilling in Advanced Manufacturing** by Brandon Siow and Ng Kee Wee Temasek Polytechnic
6	4.20pm - 4.30pm	**Paper Presentation 23:** **Data-enabled Self-Directed Learning in Engineering Education facilitated by Generative AI** by Phyoe Kyaw Kyaw, Lim Joo Ghee, Leck Hwang Keng, Mark Wan, Ho Yenn Giin and Juneita Jumaat Singapore Polytechnic
6	4.30pm - 4.40pm	**Paper Presentation 24:** **Building Industry & Learning Institutes Partnerships: Industry Now Curriculum** by Jessie Tong, Lee Ching Tiew, Eriee Pock, Heng Jun Jie, Chan Chung Hou, Tan Tuan Lin, David Chai and Mark Nivan Singh Singapore Polytechnic
6	4.40pm - 4.50pm	**Paper Presentation 25:** **Designing a Digital Twin Virtual Lab for the Module: PLC Applications, A Case Study Pilot Run** by Chia Chew Lin, Rick Chua and Lim Joo Ghee Singapore Polytechnic
6	4.50pm - 5.00pm	**Paper Presentation 26:** **Sustainability Education in a Chemical Engineering Diploma Course via Integration with the Common Core Curriculum** by Wong Yunyi, Katerina Yang and Cheah Sin-Moh Singapore Polytechnic
6	5.00pm - 5.10pm	**Paper Presentation 27:** **Online Classroom Flipping for Hybrid Teaching and Learning using AI Chatbots** by Tan Chee Wei Nanyang Technological University
6	5.10pm - 5.40pm	**Panel Discussion**

"For the latest copy of programme schedule, please visit our website at www.wes-ies.org/registration-ies/programme/."

TRACK PROGRAMME

Date : 9 November 2023, Thursday
Time : 9.00am - 5.30pm
Venue : Orchid Ballroom (Level 4) Marina Bay Sands, Singapore

Name of Track Room Track 7 - China Engineers Forum *Programme will be presented in both English and Mandarin*		
Track	**Timing**	**Author**
7	9.00am – 9.05am	**Arrival of Guest-of-Honour** **Mr Zhu Jing** Charge d'affaires Embassy of the People's Republic of China in the Republic of Singapore
7	9.05am – 9.10am	**Welcome Remarks** **Mr Dalson Chung** President IES
7	9.10am – 9.20am	**Welcome Statement by WES 2023 Strategic Partner, China Society of Engineers** Ms Luo Hui Member of the Leading Party Members Group, Director General of the Department of International Affairs China Association of Science and Technology (CAST) & Vice Chairwoman and Joint Secretary-General, Chinese Society of Engineers (CSE)
7	9.20am – 9.30am	**Special Address by Guest-of-Honour** **Mr Zhu Jing** Charge d'affaires Embassy of the People's Republic of China in the Republic of Singapore
7	9.30am – 9.40am	**Opening Address** **Prof Lionel M Ni** President The Hong Kong University of Science and Technology (Guangzhou)
7	9.40am – 10.10am	**Keynote Presentation 1:** **The Construction of Hong Kong-Zhuhai-Macao Bridge and the Latest Development of Bridges in China** by Prof Su Quanke Chief Engineer; Professor of Practice The Hong Kong University of Science and Technology (Guangzhou)
7	10.10am – 10.40am	**Keynote Presentation 2:** **Reimagining Engineering Education for Leading Sustainable Innovation** by Prof Tang Xiaofeng Associate Professor, Director of the Division of Engineering Education, Associate Dean for the National Graduate College for Engineers Tsinghua University
7	10.40am - 11.00am	***Tea Break***
7	11.00am – 11.20am	**Track Presentation 1:** **Creating a Multifunctional and Sustainable Solution Space – Kau Yi Chau Artificial Islands in Hong Kong SAR** by Ir. Jacky KY Wu Head of the Sustainable Lantau Office, Civil Engineering and Development Department, HKSAR Government
7	11.20am – 11.40am	**Track Presentation 2:** **Research and Application of Floating Sharp Eagle Wave Energy Conversion Technology** by Dr Wang Zhenpeng Associate Researcher Ph.D Guangzhou Institute of Energy Conversion
7	11.40am – 12.00pm	**Track Presentation 3:** **HTR Development in China** by Prof Dr Li Fu Institute of Nuclear and New Energy Technology, Tsinghua University, China
7	12.00pm – 12.30pm	**Panel Discussion**
7	12.30pm – 1.30pm	**Lunch**

"For the latest copy of programme schedule, please visit our website at www.wes-ies.org/registration-ies/programme/."

TECHNICAL SITE VISITS

The 3-day World Engineers Summit 2023 will be accompanied by educational attractive site visits that complement the various conference track themes. The visit will be held on 10 November 2023 (Friday).

There is a nominal fee of S$ 45 per participant for the registration.

Sustainability Technology Center (STC) at Danfoss Singapore (10am – 12pm)

Danfoss Sustainability Technology Center (STC) in Singapore is a 382m2 facility that combines product ranges and solutions across Danfoss business segments. The facility offers visitors a comprehensive view of our technologies and applications in energy efficiency and sustainability for key industry hotspots, covering marine, electrification, green buildings, cold chain, alternative food production and heavy industries. It will also serve as a training center for internal and external stakeholder for these solutions.

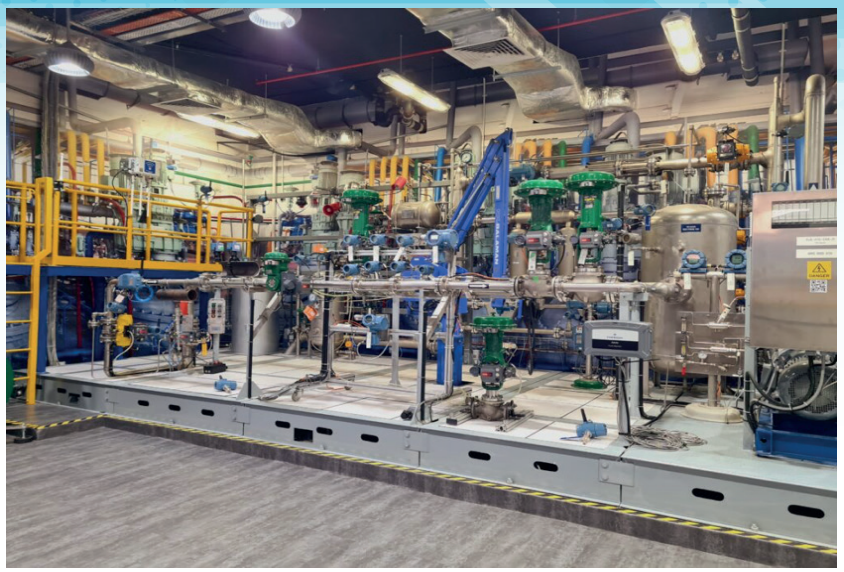
There are 5 main sections which include:

1. Marine & Electrification ADC
2. Drives Service Training Center
3. Food: CO2 Cold Room & Indoor Farm
4. Green Buildings & District Energy
5. Power Solutions Experience Center

The STC is a central technology hub for regional engineers to develop and integrate technologies or applications for various industries. It will also serve as a knowledge/training centre for customer, staff and partners in the region.

TECHNICAL SITE VISITS

Emerson Digital Plant Experience (2pm – 4pm)



We will like to invite you to our state-of-the-art Emerson Solutions Centre with a plant-like environment where you get to experience simulated process automation industrialisation. Emerson digital plant is equipped with the latest products and solutions for process control and industrial IoT applications like Advanced Data Analytics, Wireless Sensors, Location Awareness, Virtual Reality and Augmented Reality.

Sembcorp Tengeh Floating Solar Farm (2pm – 4pm)

The Sembcorp Tengeh Floating Solar Farm is Singapore's first large-scale floating solar photovoltaic (PV) system. Contributing to Singapore's goal of quadrupling solar energy deployment by 2025, the 60MWp solar farm was built with over 122,000 floating solar panels across 45 hectares and is one of the world's largest inland floating solar photovoltaic (PV) systems.

TECHNICAL SITE VISITS

Opened by PM Lee Hsien Loong in July 2021, the commencement of the solar farm's operations marks a significant step towards enduring energy sustainability in water treatment, making Singapore one of the few countries in the world to have a 100% green waterworks system.

More info: www.sembcorpenergy.com.sg/business/energy-solutions/solar/floating-solar/

Media Release: https://www.sembcorp.com/en/media/media-releases/energy/2021/july/sembcorp-and-pub-officially-open-the-sembcorp-tengeh-floating-solar-farm/

Gardens by the Bay (4pm – 6pm)

Visit The Iconic Gardens, Walk Through The Main Conservatories, Flower Dome & Cloud Forest.

This visit will be chargeable at an additional S$60 per pax, subjected to prevailing GST.

香港科技大学(广州)

HKUST(GZ)

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TECHNOLOGY (GUANGZHOU)

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PLENARY SPEAKER - DR STEVE HOWARD

Dr Steve Howard
Vice Chairman,
Sustainability Temasek

RE-IMAGINEERS OF OUR NET ZERO FUTURE

Imagine a future where the world is powered only by renewable energy, with waste reduced to near-zero and transportation leaving little to no carbon footprint. By drawing inspiration from how engineers of the past have transformed the industries we see today, what role do we see engineers playing in re-engineering the world we live in? What can we do to create a sustainable future?

Join Steve Howard, Vice Chairman of Sustainability at Temasek, as he explores the critical engineering challenges and opportunities in our pursuit of a net-zero future – by re-imagineering the world we live in.

BIOGRAPHY

Dr Steve Howard is currently Vice Chairman, Sustainability, Temasek. He first joined Temasek as Chief Sustainability Officer in January 2021. Steve is a board member of GenZero, which he helped establish, and chairs the Investment Committee. He is also a founding board member of the Temasek-BlackRock joint venture, Decarbonization Partners, and is a member of the Investment Committee. In addition, Steve is Founding Chair of the We Mean Business Coalition and a member of the LeapFrog's Global Leadership Council. He was, until recently, on the Administrative Board of SEforALL.

Before joining Temasek, Steve was Chief Sustainability Officer at IKEA Group and served on IKEA's Executive Group Management from 2011-2017. In 2015, Steve co-founded We Mean Business, a leading climate change coalition of organisations that helped support the Paris Agreement. Prior to IKEA, Steve was Founder and CEO of The Climate Group, a global NGO that has built networks of cities, states, regions, and businesses committed to a net-zero carbon world. Before the Climate Group, Steve consulted on sustainability for major corporations and institutions, working as a partner at ERM Group in London and a Director at URS Corporation.

Steve has worked with various NGOs and UN bodies on a wide range of global sustainability topics. Earlier in his career, Steve worked in WWF, where he established the Global Forest and Trade Network, chaired the UK Forest Stewardship Council and helped launch and chair The Forest Trust. Steve is trained as an ecologist and has a PhD in Ecophysiology and Environmental Physics based on research in Kenya.

PLENARY SPEAKER - PROF LOW TECK SENG

Prof Low Teck Seng
Senior Vice President (Sustainability and Resilience)
National University of Singapore (NUS)

SUSTAINABILITY – RESEARCH AND TRANSLATION FOR A RESILIENT SINGAPORE

Sustainability is the key tenet that underpins Singapore's research strategy. Borne out of necessity, our nation state emerged resilient because we embraced innovation to conserve finite resources and looked to science and technology to drive our industries. Singapore's industries have the capabilities to adapt to global shifts because they are part of a progressive science and technology ecosystem that welcomes collaborations. The talk will describe the National Research Foundation's (NRF's) early initiatives, before discussing new Research, Innovation and Enterprise (RIE) plans that build on the strong research foundation NRF has developed since 2006. New ideas and key challenges on Singapore's horizon will also be discussed.

BIOGRAPHY

Professor Low Teck Seng is Senior Vice President (Sustainability and Resilience) at the National University of Singapore (NUS).

Formerly the Chief Executive Officer of the National Research Foundation (2012 – 2022), Prof Low has played a defining role in charting Singapore's R&D roadmap, promoting, managing and coordinating R&D efforts across the nation and driving the development and implementation of three national Research, Innovation and Enterprise plans.
Prof Low was previously the Managing Director of A*STAR (2010 – 2012), the founding Principal of Republic Polytechnic (2002 – 2008), as well as the Dean of the Faculty of Engineering at NUS (1998 – 2000).

In recognition of his exceptional contributions to the strategic development of Singapore through the promotion and management of R&D, Prof Low was awarded the National Science and Technology Medal in 2004. In 2007, he was awarded the Public Administration Medal (Gold) by the President of Singapore for his outstanding contributions to the development of technical education and the management of science and technology for the nation. In 2016, he was conferred the Order of the Legion of Honour with the grade of Knight (Chevalier) by the French Government.

Prof Low is Chairman of the Singapore Maritime Institute, a Fellow of the Singapore Academy of Engineers, Fellow of the IEEE, and an International Fellow of the Royal Academy of Engineers, UK.

PLENARY SPEAKER - MR LAM WEE SHANN

Mr Lam Wee Shann
Deputy Chief Executive, Technology
Chief Technology Officer / Chief Sustainability Officer
Land Transport Authority, Singapore (LTA)

BUILDING A GREEN LAND TRANSPORT ECOSYSTEM

Land transport is the 3rd largest carbon emitter in Singapore accounting for around 15% of national emissions today. To support the nation's net-zero ambition, LTA is committed to significantly reduce land transport emissions in absolute terms. The presentation would share key decarbonisation efforts by the land transport stakeholders.

BIOGRAPHY

Mr Lam Wee Shann oversees that technology cluster in LTA, which covers areas in IT, cybersecurity, technology, open innovation, industry development and academies. He also assumed the role of Chief Sustainability Officer, in charge of planning and implementing Singapore's land transport emission abatement strategy.

Wee Shann first joined Land Transport Authority in 2017 to form and lead Technology & Industry Development group. The group is responsible for overall coordination of technology efforts as well as to develop land transport industry, in particular, the manpower development area.

Prior to his LTA stint, he set up the Futures Division in Ministry of Transport in 2013. Futures division generates foresight to shape the future of transport for Singapore, which include strategy formulation and the translation of foresight research into actionable policy insights. He had also served as the Director (Communications and Community Engagement) in the Maritime and Port Authority of Singapore from 2009, where he was-in- charge of media relations, community engagement and organisation of key events such as the Singapore Maritime Week.

Prior to his stints in the transport family, Wee Shann was with the Ministry of Defence and the Singapore Armed Forces.

Wee Shann studied at University College London on a Ministry of Defence scholarship and graduated with a Bachelor of Electrical and Electronic Engineering (Honours). Wee Shann also holds a Masters in Telecommunications from the same university.

PLENARY SPEAKER - PROF WANG TIANYI

Prof Wang Tianyi
Professor of Practice
for Innovation

HONG KONG'S ROADMAP TO CARBON NEUTRALITY

The presentation is based on our publishing book with the same name both in Chinese and English. Hong Kong's total annual carbon emissions are around 35 million tons CO2 equivalent, less than 5 tons per capita. The top three sources of carbon emissions are power generation over 60%, transportation close to 20% and waste disposal close to 10% respectively, totally over 90%.

Hong Kong promised to achieve carbon neutrality by 2050. In order to achieve the goal Hong Kong should focus on the above three major sectors, by zero carbonized energy production, zero carbonized transportation and zero carbonized solid waste treatment. At the same time CCUS will be used as the final technology. How to realize the challenging goal and how to design the roadmap and to have reasonable path selection, the presentation will share with you the key points.

BIOGRAPHY

Dr. Wang is Professor of Practice for Innovation, Entrepreneurship and Public Policy at Hong Kong University of Science and Technology (Guangzhou); Adjunct Professor at Tsinghua University and Co-Director of the Public-Private Partnership Research Center of Tsinghua University; Member of China Council for International Cooperation on Environment and Development (CCICED).

He also served as Chairman and CEO of China Everbright Environment (Group) Limited, China's biggest environment company and world's largest waste-to-energy company; President of Shandong Provincial Academy of Sciences; Deputy Mayor of Jinan City and Vice President of Yantai University.

He was honored the "Best CEO in Asia" by Institutional Investor and Corporate Governance Asia consecutively in 2018, 2019, 2020 and 2021; In 2020, He was awarded the 2018-2019 "Green China Person of the Year", the highest award established by Chinese government in the field of Ecology and Environment.

Dr. Wang has published academic books, which include Environmental Protection and Carbon Neutrality; Hong Kong's Roadmap to Carbon Neutrality--The Strategic Goals and Path Selection; PPP: Theory and Practice; International Series of Books on PPP including Canada, Australia, Japan and Singapore; Joint Stock Cooperative Economy in China; Accounting Information System.

KEYNOTE SPEAKER

Prof Dr Suhono Harso Supangkat
Director
Smart Cities and Communities Innovation Center Indonesia

SMART CITIES IN INDONESIA: IMPLEMENTATION AND CHALLENGES

In the last decade, the implementation of smart cities to address urban issues has continued in Indonesia. Smart City is a city that can use its resources effectively and efficiently to solve urban challenges using an intelligent solution by providing infrastructures and providing urban services to improve quality of life. Cities in Indonesia such as Semarang, Bandung, Makassar, Surabaya, and Jogjakarta continue to develop this concept. However, implementing a Smart City through smart solutions is not easy. The developed intelligent solution does not bring significant benefits to citizens. Problems encountered include (1) wide scope (don't assume a limited scope), (2) impact is not perceived by citizens, (3) too much focus on technology, forgetting about governance and human resources, (4) Lack of assessment (5) do not start from core value but focus on added value in implementation, (6) do not manage sustainability

Responding to this challenge requires the awareness of all stakeholders, from the government, to the private sector, and community. The government must coordinate to improve good governance, strengthen human resources, and engage the community in the development of appropriate technologies. Specifically related to the problem of the scale of implementation of smart cities and their impact on society, the living lab approach can be a solution for the development of innovations where the benefits and impact on society are immediately seen. The Living Lab is a small-scale implementation that is more controlled and whose impact can be measured directly in the area.

BIOGRAPHY

Prof Dr Suhono, was born in Yogyakarta Indonesia, 3 December 1962. He received the B.S from Department of Electrical Eng. Bandung Institute of Technology (ITB) Indonesia in 1986 and holds Dr. of Engineering from Graduate School of Information System the University of Electro-Communication Tokyo Japan in 1998. From 1998-2002, he was secretary of Electrical Engineering Department Bandung Institute of Technology. During 2002-2006, he was coordinator program on Graduate School of Information Technology in ITB. 2003-2009 Prof Suhono was assigned as a Chairman of Business Incubator Center at ITB. Since 2010, the center was extended to become Institute for Innovation and Entrepreneurships Development and Suhono acts as a Chairman with the center.

Since 2000 he has been assisting some Government activities and industries, especially on Regulations and IT Governance. From 2007 till 2009 he was appointed as Special Advisor to the Minister of Communication and Information Technology, Republic of Indonesia.

KEYNOTE SPEAKER

Mr Felix Loh (罗志威)
Chief Executive Officer
Gardens by the Bay

BIOGRAPHY

Mr Felix Loh began his career in National Parks Board after graduating with a Bachelor of Horticulture 1st Class (Science) from Massey University, New Zealand, under a Singapore Government Scholarship. He was subsequently awarded a National Parks Board scholarship and obtained a Master of Science in Floriculture and Ornamental Horticulture from Cornell University, USA.

Over the course of his career, he has held several key positions in National Parks Board and Ministry of National Development, and has more than 20 years of experience in parks management, horticulture and landscape industry development, as well as policy development. Prior to joining Gardens by the Bay, he served as Senior Director (Corporate Development) and oversaw the corporate functions of the Ministry of National Development, including finance, estates, engagement and partnerships, human resource, knowledge management and IT. In recognition of his dedicated service, he was awarded the Public Administration Medal (Bronze) in 2005 and Public Administration Medal (Silver) in 2012.

Mr Loh joined Gardens by the Bay in 2014 as its Chief Operating Officer. A champion of R&D in sustaining the Gardens' growth, he led the horticultural team to successfully achieve flowering blooms on highly challenging temperate species such as cherry blossom and dahlias, which have since become marquee floral displays in the Gardens' calendar of events. He has also been involved in the deployment of new and emerging technologies, like the first fully-operational self-driving vehicle in Asia, at the Gardens.

Mr Loh is the Board Member of Workforce Singapore and Deputy Honorary Secretary of the Singapore National Employers Federation (SNEF). A former member of the Council of Tripartite Workgroup on Lower Wage Workers, he is currently Co-Chair of the Tripartite Cluster for the Landscape Industry and Tripartite Cluster for Waste Management. Mr Loh is also a member of the International Visiting Committee of Longwood Gardens, Philadelphia, one of the foremost show gardens in America.

KEYNOTE SPEAKER

Dr Edward Ang
Director, Green Building Policy and Technology

SINGAPORE GREEN BUILDING MASTERPLAN: A ROADMAP TO DECARBONISE THE BUILT ENVIRONMENT

Singapore has raised our national climate change commitment to achieve net zero emissions by 2050. The Built Environment sector plays a critical role as buildings account for over 20% of Singapore's emissions. A strong foundation has been laid through the Singapore Green Building Masterplan and its '80-80-80 in 2030' targets and policies. The shift for innovative solutions and new technological advances are key for BE sector to collectively achieve net zero. Leveraging on research, innovation and technologies, engineers play a key role to push boundaries for best-in-class green buildings to further decarbonise. In terms of energy cost savings, carbon reduction, health and well-being, Super Low Energy Buildings are a necessary step in decarbonising the Built Environment and hence it's imperative for engineers to design, operate and maintain SLEBs.

BIOGRAPHY

Dr Edward Ang leads a team in BCA to develop green building policies and drive the Singapore Green Building Master Plan measures to push the built environment sector towards the 80-80-80 goals in 2030 and towards net zero in 2050. He has more than 15 years of experience in public sector across a diverse portfolio ranging from research, sustainable construction, manpower and strategic policy to Green Mark, Super Low Energy buildings and green building policies. He sits in various industry and inter-agency committees related to environmental sustainability and the Environment Resources Standard Committee. In addition to policies, his current portfolio also includes advancing green building technologies through research and innovation. He was awarded the Public Administration (Bronze) Medal at the National Day Awards 2022.

KEYNOTE SPEAKER

Prof Chu Jian
Chair of School of Civil and Environmental Engineering, Nanyang Technological University, Singapore

INTEGRATED SOLUTIONS FOR COASTAL PROTECTION, FLOOD CONTROL, CLEAN WATER AND SPACE

One of the major challenges facing coastal cities is sea level rise. Protection of coastal cities from adverse impacts of sea level rise such as inundation and flooding is a resource demanding task. Civil engineers can play a pivotal role in developing cost-effective solutions to reduce the cost involved and maximize the benefits. One of the options is to adopt an integrated design by integrating coastal protection systems with other developments including space creation, flood control, clean water, transportation and marine ecosystem restoration. Some of the solutions and ideas developed at Nanyang Technological University such as flexible seawalls for coastal reservoirs and suspended city for space creation will be presented. Engineering challenges faced in the proposed solutions such as seawall construction in deep water, beneficial use of waste materials, cultivation of coral reefs and nature-based solutions for mangroves and seagrass plantation will also be discussed in this talk.

BIOGRAPHY

Prof CHU Jian is President's Chair in Civil Engineering, Chair of the School of Civil and Environmental Engineering and Director of the Centre for Urban Solutions at Nanyang Technological University (NTU). He also worked for Iowa State University, USA, from 2011 to 2014 as professor and James M. Hoover Chair in Geotechnical Engineering. Prof Chu is currently the Chair of Technical Committee TC217 on Land Reclamation and a Committee Member for TC211 on Ground Improvement under the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE). He is an Editor of a high impact journal Acta Geotechnica, Editor-in-Chief of a new journal Biogeotechnics, and Co-Editor for Journal of Materials in Civil Engineering, ASCE. Prof Chu has delivered over 70 keynote or invited lectures at international conferences. As a past President of the Geotechnical Society of Singapore, Prof Chu has also worked as a consultant or advisor for several large-scale projects in Singapore and overseas. He received the R. M. Quigley Award from the Canadian Geotechnical Society in 2004 and the Outstanding Geotechnical Engineer Award from the Geotechnical Society of Singapore in 2018.

KEYNOTE SPEAKER

Dr Ronny Sondjaja
Vice President & Head Research, Development & Innovation – Region Asia Pacific

NEXT GENERATION SOLUTIONS & TECHNOLOGIES TO ENABLE GREEN TRANSFORMATION IN CHEMICAL INDUSTRY

The energy transition towards sustainability is inevitable. Innovation in specialty chemicals & specialty materials enable the transformation of the chemicals industry are developed. At Evonik, we develop Next Generation Solutions & Next Generation Technologies to drive sustainable portfolio transformation as well as to meet our CO2 reduction pathway. Particular examples are our advancement in technologies to enable adoption of hydrogen economy through our membrane technology, catalyst competency and specialty materials for hydrogen infrastructure.

BIOGRAPHY

Dr. Ronny Sondjaja is the Vice President & Head of Research, Development & Innovation (RD&I) for Evonik in Region Asia Pacific. In this role, he has the responsibility to strengthen the R&D footprint of Evonik in Asia Pacific, particularly at Evonik R&D hubs in Singapore, Shanghai and Mumbai. He is also the Site Director for Singapore's Evonik Asia Research Hub since April 2018 where he build, lead and grow the Research Hub with high-competence multidisciplinary teams of scientists and researchers to propel the growth of Evonik through development of high-impact global projects.

Over his 14 years of career at Evonik, he has experience in multiple functions, including Global Product Manager for Driveline Fluid – Business Line Oil Additive (Germany, 2016-2017), Head of Research for New Business (Germany, 2011-2015) and Product Development Manager for Biodiesel Additive (Singapore, 2008 – 2011).

KEYNOTE SPEAKER

Er Lucas Ng HK
Senior Advisor
Head, Sustainability
PCS Pte. Ltd.

INDUSTRY SUSTAINABILITY 1 2 3 4

Climate change is the defining crisis of our time and it is happening even more quickly than we feared. Across the globe, more countries have heeded the call to take action against climate change and are enacting legislations to limit carbon emissions and promote recycling and reduction of waste. Indeed there is a saying that the global warming is over, and now we are facing "global boiling".

As we are all aware, the operations of energy and essential chemical industry are energy and carbon intensive, and thus the challenges of sustainability going forward are to reduce or even eliminate carbon footprint.

The strategy, scope and timeline of the industry sustainability are subject to the specific carbon origins and the technology readiness level of mitigation measures or solutions of the time. In view of bountiful of information, the presentation will categorise the sustainability strategies into four categories for ease of detailed study, evaluation and decision making for implementation. They are (1) energy efficiency (2) carbon abatement (3) circular economy (4) renewable solutions. This is also a practical approach of decarbonisation that is solution-focus applicable to the industry.

BIOGRAPHY

Er. Lucas NG currently serves as Senior Advisor and heads the PCS Sustainability Team focusing on carbon abatement. PCS is the upstream company, an essential chemicals producer, of the Singapore Essential Chemicals Complex incorporated in 1977. He has been serving the company for more than 39 years since 1984 and experienced in technical, engineering, maintenance, process and operations of several petrochemical plants and associated infrastructures, contributed to execution of various major projects and plant turnarounds. Prior to joining PCS in 1984, he was with the Port of Singapore Authority (PSA) from 1980. Er. NG served in various institutions and committees, involving academic institutions, government agencies, professional bodies and trade associations, including Chemical Standards Committee (CSC) by SDO@SCIC appointed by Enterprise Singapore (ESG). Currently he is the Chair of CSC and the Jurong Island Vision Zero Group.

He has been in the hydrocarbon processing industries for more than 43 years since his graduation as a chemical engineer in 1980, promoting process safety, fire & security, asset integrity & reliability, water conservation and energy efficiency, and now sustainability. Er. Ng is a registered Professional Engineer (Chemical) with Professional Engineers Board of Singapore, and a Chartered Engineer (Chemical and Process) with the Chartered Engineer Board / Institution of Engineers, Singapore (IES). He is also an Energy Efficiency Opportunities (EEO) Assessor registered under IES and National Environment Agency (NEA).

KEYNOTE SPEAKER

Mr Hong Bum Jung Joseph
Head of the Hyundai Motor Group Innovation Center in Singapore (HMGICS)

THE JOURNEY TOWARD META FACTORY

[Disruptive change in Automotive industry]
The paradigm shift in the automotive industry can be summarized as a shift toward future automobiles with mobility, electrification, connectivity, and autonomous as the 'MECA'.
'Mobility' will be the beginning of the transition from manufacturing to services.
'Electrification' is a cost-bearing challenge for global OEMs on environmental regulations.
'Connectivity' requires convergence with a variety of heterogeneous industries in past machinery industries.
'Autonomous' is the evolution of automobiles made possible by technological innovation.

[Change in Hyundai Motor Company's strategy]
In response to these changes, Hyundai Motor Company plans to pursue a mid- to long-term strategy focusing on smart mobility devices, smart mobility services, and hydrogen solutions with the goal of transforming into a smart mobility solution provider.
As vehicles must go from providing only simple transportation to providing optimized services to customers as digital devices, we plan to accelerate digital transformation by innovating products and expanding our platform-based mobility service business.

[Singapore HMGICS Vision]
We aim to lead change and innovation in the manufacturing industry through future innovative technologies and new business development/demonstration in ASEAN and Singapore, a global hub, and promote transformation into a future-oriented global innovative brand.
Accordingly, HMGICS will serve as a test bed for digital transformation of the entire value chain and demonstrate the Urban Micro Factory to present Hyundai Motor Group's future mobility vision.

[HMGICS Promotion Direction]
The Intelligent Innovation Manufacturing Platform (M-CHoRD), the core of HMGICS, was developed with the goal of Market Driven Manufacturing.
After building the first intelligent platform-based smart factory, we plan to gradually evolve into a meta smart factory operating system that fuses reality and virtuality.
The HMGICS manufacturing innovation technology developed and demonstrated in this way will be expanded to other factories and play a leading role in Hyundai Motor Group's transformation into a global smart factory.

BIOGRAPHY

Mr. HongBum Jung is the head of the Hyundai Motor Group Innovation Center in Singapore (HMGICS). He started his current role in April 2020 and is responsible for leading the innovation centre towards its aim of achieving human-centered value chain innovation to move cities towards a mobility paradigm shift. With more than three decades of experience in this field, he leads the charge to realise the potential of HMGICS's smart automotive manufacturing and robotics solutions, and make HMGICS the leading facility for the development of a metaverse for the manufacturing industry. Starting off as a Research Engineer, he has been with the company for over 36 years, gradually moving on to take up more responsibility as Director of Pilot/Prototype Division to Head of Pilot Center Division. With his deep expertise as authority in the industry, enthusiasm and firm leadership, he continues to aims to develop new EV business models, forge innovative partnerships, produce mobility products, and develop the Group's intelligent manufacturing platform to revolutionize the overall sustainable mobility value chain. Under his charge, HMGICS has produced a multi-award winning car, the IONIQ 5, the first EV made in Singapore.

KEYNOTE SPEAKER

Mr Kenneth Wong
Deputy Group Director,
Active Mobility Group
Land Transport
Authority (LTA)

BIOGRAPHY

Mr Kenneth Wong has more than 25 years of experience in the development of Singapore's land transport system. As a transport planner, Mr Wong collaborated closely with land planning and development agencies to effect Singapore's sustainable and integrated land use-transport implementation strategy.

He led Planning Teams in LTA and was responsible for developing Singapore's long term and medium-term transport infrastructure plans.

He is currently the Deputy Group Director, Active Mobility Group, LTA. To support Singapore's car-lite and sustainable mobility strategies, the Group develops Singapore's Islandwide Cycling Network, formulates active mobility policies and regulations as well as promulgates and promote active mobility modes.

Mr Wong has a MSc Degree, in Transportation Systems and Management from the National University of Singapore.

KEYNOTE SPEAKER

Dr Yap Fook Fah
Co-Director, Transport Research Centre@NTU
Nanyang Technological University

REIMAGINING URBAN LIFE: EXPLORING INNOVATIONS IN URBAN MOBILITY FOR A SUSTAINABLE FUTURE

In this talk, we will embark on an insightful exploration of the future of urban mobility, focusing on the innovative solutions that promise to redefine our urban landscapes and contribute to a sustainable future.

The talk will kick off with a reflection on the evolution of urban mobility, identifying the key challenges and bottlenecks faced by today's cities, from traffic congestion and pollution to inequities in access. This underscores the pressing need to reimagine urban mobility, factoring in sustainability as a critical design principle.

The core of the talk will delve into innovative technologies and strategies being implemented globally and in Singapore to promote smart and sustainable mobility. We will examine emerging trends such as connected, autonomous, shared, and electric vehicles, smart public transit systems, micromobility, and the integration of Information and Communication Technology (ICT) in urban transportation planning. We will highlight success stories from cities that have pioneered these concepts and achieved significant milestones in their pursuit of sustainable urban mobility.

We will also explore the role of urban design and planning, discussing the concept of Avoid-Shift-Improve, complete streets, and the importance of creating pedestrian and bicycle-friendly infrastructure. The interconnection between urban mobility and other aspects of urban life, such as public health, social equity, and economic vitality, will also be examined.

The talk will conclude with a call to action, stressing the collective responsibility of urban planners, policymakers, transportation professionals, and city residents to participate in the journey towards a more sustainable urban mobility future.

BIOGRAPHY

Dr Yap is currently the Co-Director of the Transport Research Centre, NTU, and a member of the Land Transport Authority's Active Mobility Advisory Panel. He is an Associate Professor at the School of Mechanical and Aerospace Engineering, NTU, Singapore. His research interests include safety of personal mobility devices, dynamics and vibration control of vehicles, railways, and trains. He has collaborated with researchers and engineers across a range of industries including defence, marine, railway, automotive and aviation industries. Dr. Yap's views have often been sought after by the industry, the press, and the legal profession.

KEYNOTE SPEAKER

Dr Wang Su
Senior Scientist
Pan-United Concrete Pte Ltd

USING LOW-CARBON CONCRETE TECHNOLOGIES TO REDUCE EMBODIED CARBON

The built industry accounts for a staggering 40% of global carbon emissions, as reported by the World Green Building Council. The current industry conversation is dominated by much talk on reducing operational carbon emissions to lower our carbon footprint. Yet a refocus to reducing embodied carbon is all the more significant considering that while operational carbon can be reduced over the building lifespan, embodied carbon is irreversible once produced.

Embodied carbon is produced during the production, transportation and use of building materials such as concrete, as well as construction onsite. Advanced CCU technology has enabled waste CO2 to be mineralised and embedded within concrete to achieve the same levels of durability, workability and performance as ordinary concrete.

A whole life carbon approach to addressing carbon emissions becomes imperative as embodied carbon cannot be mitigated once a building commences operations. More and more developers, owners, architects and engineers are realising the impact of embodied carbon in reducing the whole life carbon of new buildings. The green transition is gaining momentum as these industry players increasingly specify CO2 mineralised concrete during the project design stage to decarbonise their projects.

BIOGRAPHY

Dr Wang Su is a Senior Scientist at Pan-United Concrete, a wholly-owned subsidiary of Pan-United Corporation Ltd (Pan-United). He has over a decade of experience conducting research on concrete and cementitious materials. At Pan-United, Dr Wang utilises the latest technology to innovate and develop specialised low-carbon concrete for the built environment. He also plays a pivotal role in studying and exploring the viability of using novel ingredients to enhance Pan-United's suite of concrete solutions. Currently, Dr Wang is a Co-Principal Investigator of a project sponsored by Singapore's national water agency, PUB, on the applications of carbon-negative minerals recovered from waste streams in concrete.

KEYNOTE SPEAKER

Mr Lim Eng Boon
Deputy Director
(Projects)
Hwa Seng Builder Pte
Ltd

CULTIVATING A SUSTAINABLE WORK ECOSYSTEM FOR A GREENER AND RENEWABLE BUILT ENVIRONMENT

To bring about a greener and renewable Built Environment, we need to cultivate a sustainable ecosystem within and outside the organization. This requires strong mandate from the top management and collective efforts from the employees to think, to innovate and to adopt sustainable practices that will influence and impact the greater good in our built environment.

Looking at the drastic climate change that we have seen and experienced around us right now, it is crucial to cultivate the seed of sustainability into the organizational core values and missions that needs to be rooted into the corporate DNA.

Playing a crucial part in accelerating the green movement in the built environment, we had adopted green actions in our design, build & manage to address the climate change, enhance health & wellbeing to mankind and adoption of more renewable resources.

Lastly, a question to ponder for all Engineers if we are still ignoring the calling for a greener and renewable environment. What does our future generations need to bear as a consequence of our actions? Whether we had done enough so far and what is more for us right now that we can do as an individual or organisation to push for more initiatives & movements in the built environment.

BIOGRAPHY

Lim Eng Boon is the Deputy Director (Projects) with Hwa Seng Builder Pte Ltd, a homegrown local construction firm that starts in 1992 and is now a leading Civil Engineering and Construction Provider in the areas of Road & Rail Construction.

He graduated from Nanyang Technological University, with Civil and Environmental Engineering degree in year 2002, Design for Safety Professional (DfSP) and is accredited as Professional Project Director (PPD) under Society of Project Managers Singapore. 21 years in the local construction industry, he had managed and completed several bridges, viaducts & road projects with clients from Land Transport Authority, Singapore Prison Services, Jurong Town Corporation, Building Control Authority, Changi Airport Group.

Some of the recent notable projects include the bridge & road network around Changi Terminal 4 and the Expansion of KPE/TPE interchange at Punggol overcoming tight schedule, technical challenges and Covid-19 which won the prestigious Land Transport Excellence award under the award category in "Best Managed Rail/Road Infrastructure – Project Partner".

Lim Eng Boon was also the award recipient of the Outstanding Project Manager Award 2022 for Contract Sum more than S$85 million Category from Society of Project Managers.

KEYNOTE SPEAKER

Mr Eric Soh
Chief Executive Officer,
Samwoh

REDEFINING THE FUTURE OF BUILT ENVIRONMENT: INNOVATING WITH PURPOSE

From humble beginnings as a transport and logistics company in 1975, Samwoh has grown and transformed into a leading engineering and infrastructure enterprise. Our comprehensive suite of services includes supplying building materials and precast concrete components, recycling construction and industrial wastes, civil infrastructure engineering, underpinning these businesses' is our continuous pursue of research and innovation and pavement consultancy services.

Join us as we share our inspiring journey through sustainable construction, exploring its environmental significance and resource-conscious practices. At the heart of our commitment lies a desire to reduce our carbon footprint and to innovate holistic solutions for our valued community. Witness our success stories spanning over 40 years – from the inception of the first building in the region constructed using up to 100% recycled concrete aggregates, the Samwoh Eco-Green Building, in 2009, to the commissioning of Singapore's first positive energy industrial building, Samwoh Smart Hub, in 2022, and many other innovative, practical solutions within the industry.

Immerse yourselves in the conceptualisation of the Samwoh Smart Hub as we unveil the deployment of highly efficient solar panels, passive and active building design strategies, complemented by cutting-edge smart energy management.

This insightful sharing will open your minds to the transformative potential of sustainable and innovative practices within Singapore's Built Environment landscape today, paving the way for a greener and brighter tomorrow.

BIOGRAPHY

Having joined the Samwoh Group of Companies in 1997, Mr Eric Soh has held a series of senior positions within the organization, culminating in his appointment to the Board of Samwoh Corporation Pte. Ltd. in 2000. His extensive experience and expertise have further led him to serve on the Boards of several subsidiaries and associated companies.

In 2013, Mr Soh was elected as the Chief Executive Officer, assuming a pivotal role in formulating and driving strategic business plans, forging partnerships, and expanding the Group amidst the ever-evolving business landscape.

With more than 25 years of in-depth and diverse experience in the Built Environment sector, Mr Soh stands as an ardent advocate for change management, championing automation, digital transformation, research and innovation. His visionary leadership has been instrumental in charting the growth trajectory of the Group with a strong emphasis on innovation, sustainability, productivity and safety.

A trailblazer in sustainable development, Mr Soh has elevated his green endeavour to new heights with the development and commissioning of the Singapore's first positive energy industrial building, the Samwoh Smart Hub. This demonstration building serves as a catalyst to spur the onus towards greater sustainability within the Built Environment community, foster a vibrant learning eco-system to nurture future generations, and extend the frontiers of innovations beyond Singapore's shores. Mr Soh's passion in innovation and sustainability pursuits exemplify his commitment to driving positive change within the industry.

KEYNOTE SPEAKER

Dr Goh Kok Hun
Group Director
(Infrastructure Planning Authority), URA

ENHANCING INFRASTRUCTURE AND UTILITY PLANNING IN SINGAPORE

With the rapid growth and development of cities, it is imperative to optimize the utilization of subterranean space for efficient and sustainable urban infrastructure. In Singapore, the increasing demand for urban infrastructure to support new developments and the intensification of existing developments, has made the subterranean space increasingly congested and cluttered. To ensure sustainable development of subterranean space, the Infrastructure Planning Authority Group (IPAG) of URA has developed a new workflow for infrastructure and utility planning in Singapore to enhance the coordination of infrastructure projects, optimise subterranean space, and synergise implementation. The presentation will also explore various types of optimisation strategies and engineering solutions to better integrate, optimise and future proof infrastructure corridors and how digital enablers can support the enhanced infrastructure planning workflow.

BIOGRAPHY

Dr Goh Kok Hun is currently the group director for Infrastructure Planning Authority group in the Urban Redevelopment Authority of Singapore. He has more than 20 years of engineering experience and has been involved in the design aspects of several transport infrastructure projects in Singapore, including the Fort Canning and the Woodsville road tunnels and more recently the North-South Corridor road and Cross Island Line rail projects. He specializes in geotechnical engineering with a doctoral study on the "Response of ground and buildings to deep excavations and tunnelling" and he has also conducted specific studies in other aspects of geotechnical engineering design. A recipient of the Outstanding Geotechnical Engineer Award from the Geotechnical Society of Singapore in 2020, he is registered as a professional engineer in civil engineering and a specialist professional engineer in geotechnical engineering in Singapore, and also a chartered professional engineer.

KEYNOTE SPEAKER

Mr Loh Yew Chiong
Deputy Principal
(Academic)
Singapore Polytechnic,
Singapore

EXCELLENCE IN ENGINEERING EDUCATION: EMPOWERING NEXT-GENERATION INNOVATORS

Explore the transformative potential of Conceiving — Designing — Implementing — Operating (CDIO) and Teaching & Learning 4.0 in empowering the next generation of engineers. Discover how CDIO serves as a key pedagogy for developing engineering innovators and an education model for a holistic curriculum and enriching education experience. The speaker will share education practices that will prepare learners to embrace future challenges and to be life-ready, work-ready, and world-ready.

BIOGRAPHY

Mr Loh Yew Chiong joined Singapore Polytechnic in 1996 as a lecturer in the School of Electrical & Electronic Engineering, after working as a software engineer for 3 years. He is currently appointed as the Deputy Principal (Academic), overseeing all academic schools, academic quality, and education development. Prior to the current appointment, he was appointed as Senior Director overseeing School of Electrical & Electronic Engineering, School of Mechanical & Aeronautical Engineering, Singapore Maritime Academy, School of Computing and School of Chemical & Life Sciences.

Mr Loh had taught various courses like Network Security, Broadband Communications, Digital Communications, Networks and Protocols, Programming and other professional industry certification courses. He was also involved in various staff and student R&D projects related to Next Generation Networks and Services.

Mr Loh holds a Bachelor of Engineering (1st Class Hons) from the National University of Singapore and a Master of Science with Distinction (Communications and Signal Processing) from the Imperial College of Science, Technology and Medicine, UK. He was awarded the R&D Commendation Award in 2004 and 2009, and the Excellence in R&D Award in 2013 by Singapore Polytechnic. He was conferred the National Day Award - Public Administration Medal (Silver) in 2018.

KEYNOTE SPEAKER

Prof Ethan Chong Yih Tng
Head of Sustainability (Education & Research)
Singapore Institute of Technology

SUSTAINABLE DEVELOPMENT THROUGH EDUCATION

To teach a topic like machine element design, we use the scaffolding of knowledge ranging from mathematics and physics to the dynamics of motion. In the case of learning a sustainability topic, for instance to design an environmentally friendly solution, the scaffolding is less established. Sustainable development is a relatively new area in the teaching and learning space. It has a rapidly increasing body of knowledge, including sciences, technologies, policies, and others. The knowledge and skillsets that can be learnt are of a wide range as the sustainability agenda is a concern of almost every job role, across different sectors of industry as well as functions and levels in an organization. Due to the broad and multi-faceted nature of sustainability, it can be difficult to structure a curriculum and deliver the relevant contents to learners with different needs. This sharing discusses some of the potential strategies in preparing learners for the global agenda.

BIOGRAPHY

Ethan Chong works in the areas of sustainable development, engineering design, and artificial intelligence. He develops educational programmes in sustainability, while extending and synergizing applied research activities related to sustainability. Dr Chong envisions an industry driven by cutting-edge technologies, and a continuous-learning paradigm founded upon the requirements of the future economy. In SIT, he also supports the industry in developing solutions and manpower through R&D and training. Besides being an engineer and educator, A/P Chong is passionate in developing a highly liveable nation through his different areas of work.

KEYNOTE SPEAKER

Professor Lock Kai Sang
Professor (Engineering), Singapore Institute of Technology
Executive Chair, Washington Accord
Emeritus President, Institution of Engineers, Singapore

ENGINEERING EDUCATION: LEVERAGING TECHNOLOGY FOR PEDAGOGY TRANSFORMATION

As technology continues to advance and society evolves, engineering education pedagogy will also transform to shape how engineering is taught and learned. Future engineering education will leverage on technologies such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR), and Internet of Things (IoT), for immersive and interactive learning experiences. Students can engage in virtual labs, simulations, and design projects that closely mimic real-world scenarios, enhancing their understanding and skills. Powered by AI, personalized and adaptive learning will tailor the learning to individual students' strengths and weaknesses to focus on areas where they need improvement and to learn at their own pace. Competency-based pedagogy that integrates work and study will promote stronger academia-industry partnership on upskilling and lifelong learning. To prepare the next generation of engineers to tackle complex global challenges and drive innovation, the future of engineering education pedagogy will focus on interdisciplinary learning, sustainability, digital skills, critical thinking, ethics, global perspectives, industry engagement, and soft skills development. By aligning with societal and economic needs, engineering education will produce graduates who are well-prepared to contribute meaningfully to society.

BIOGRAPHY

Professor Lock is the Executive Chair of the Washington Accord. He is a Professor (Engineering) at the Singapore Institute of Technology (SIT) and the Head of its Energy Efficiency Technology Centre. He is an Emeritus President and an Honorary Fellow of the Institution of Engineers Singapore (IES). He served as the Founding Chairman of the Engineering Accreditation Board, IES, from 2002 to 2009, leading IES to become a signatory of the Washington Accord in 2006.

Professor Lock has a unique blend of practicing and academic experience acquired through a career which is equally split between the industry and the academia. He received both his B.Sc. (1975) and Ph.D. (1979) degrees in Electrical Engineering from the University of Strathclyde, UK. He was a faculty at the Department of Electrical Engineering, National University of Singapore for 17 years when he left to set up his consulting practice in 1997. He returned to the academia as a professor at SIT in 2016 after 20 years in the industry.

He is a registered Professional Engineer (Electrical) and served as a Board Member of the Professional Engineers Board, Singapore for 14 years. He is a Fellow of Academy of Engineering Singapore and an Honorary Fellow of the ASEAN Federation of Engineering Organizations. He plays an active role in energy efficiency, being the Chairman of Accreditation Committee for Energy Service Companies (ESCOs) and the Co-Chair of Steering Committee of Singapore Certified Energy Managers (SCEM) Scheme.

He is the co-Laureate of the 2021 WFEO Medal for Excellence in Engineering Education awarded by the World Federation of Engineering Organisations. He received the Public Service Medal (2015) and the Public Service Star (2020).

KEYNOTE SPEAKER

Prof Lionel M. Ni
President of Hong Kong University of Science and Technology (Guangzhou) (HKUST(GZ))

BIOGRAPHY

Professor Lionel M. Ni is the Founding President of the Hong Kong University of Science and Technology (Guangzhou) (HKUST(GZ)). Professor Ni earned his PhD degree in Electrical Engineering from Purdue University in 1980. He served as Vice Rector (Academic Affairs) and Chair Professor in the Department of Computer and Information Science at the University of Macau; Chair Professor and Head of Department of Computer Science and Engineering, Dean of HKUST Fok Ying Tung Graduate School and Special Assistant to the President; Professor in Computer Science and Engineering at Michigan State University (1981 to 2002), the Microelectronic Systems Architecture program director at US National Science Foundation (1995-1996) co-founder and CEO of CC&T Technologies, Inc., Michigan (1998-2001), and the Chief Scientist of the China's National 973 Program on Wireless Sensor Networks (2006 to 2011).

Professor Ni's research interests include high-performance computing, internet technologies, mobile computing, wireless networking, big data, and intelligent computing. He has published three books and over 360 refereed journal and conference articles with over 37,000 citations on Google Scholar. The winner of eight best paper awards, he has multiple achievements including ownership of 28 US/China patents and having supervised 73 well-placed PhD students.

A Life Fellow of IEEE and Fellow of Hong Kong Academy of Engineering Sciences, Professor Ni won the Overseas Outstanding Contribution Award from China Computer Federation in 2009, the First Class Award in Natural Sciences from the Ministry of Education, China in 2010, the Second Class Award in Natural Sciences for Research Excellence from the State Council, China in 2011, and the First Class Award in Science and Technology from the Guangdong Province in 2014.

倪明选，香港科技大学（广州）创校校长。倪教授于1980年获得美国普渡大学电机工程博士学位，曾先后担任香港科技大学首席副校长，校长特别助理、霍英东研究院院长及计算机科学及工程系主任与讲座教授，澳门大学学术副校长、电脑及资讯科学系讲座教授，密歇根州立大学计算机科学与工程系教授，美国国家科学基金会微电子系统结构项目主任，美国CC&T技术公司联合创办人兼行政总裁。

倪明选教授是IEEE终身会士，香港工程科学院院士，论文引用超过38,000次（据Google Scholar），曾先后获得8次国际会议最佳论文奖，成功申请28个美国、中国授权的专利，并指导73名博士毕业生。

倪明选教授积极参与中国内地学术事务。曾先后获得中国计算机学会海外杰出贡献奖（2009），教育部自然科学一等奖（2010），国家自然科学二等奖（2011），以及广东省科学技术一等奖（2014）。他曾先后担任国家973计划无线传感网项目首席科学家（2006-2011）、清华大学IV访问讲座教授、上海交通大学神州数码访问讲座教授、中国科学院海外评审专家、中国国家自然科学基金委员会及科技部专家小组成员，以及4个国家重点实验室/国家工程中心的学术委员会成员。

KEYNOTE SPEAKER

Prof Su Quanke
Chief Engineer of the Cross-Sea Engineering and Integrated Transportation Research Institute

THE CONSTRUCTION OF HONG KONG-ZHUHAI-MACAO BRIDGE AND THE LATEST DEVELOPMENT OF BRIDGES IN CHINA

HZMB - a clustered mega sea-crossing link jointly built by the three regional governments. In order to realize the construction goal of the project, the Authority has made every effort, in both management and technical POV (point of view), from the early feasibility stage to the stage of O&M(operation&maintenance). This PPT mainly introduces MF (main features) /KT(key technologies) of the clustered facilities, a forward-looking research on integrated intelligent O&M, and a summarization of major bridges recently built/under construction in China.

BIOGRAPHY

Quanke Su is a Professor at the Hong Kong University of Science and Technology (Guangzhou) and serves as the Chief Engineer of the Cross-Sea Engineering and Integrated Transportation Research Institute. He also holds positions as Vice Chairman of the Bridge Branch of the China Civil Engineering Society, Member of the 13th National Committee of the Chinese People's Political Consultative Conference (CPPCC), and Member of the Committee of Experts of the Ministry of Transport. Previously, he served as the Chief Engineer of the Hong Kong-Zhuhai-Macao Bridge Authority.

Professor Su was honored with the Outstanding Contribution Award (given to only 2 awardees worldwide) from the International Association for Bridge Maintenance and Safety (IABMAS) in 2018, as well as the 6th National Outstanding Professional and Technical Talent and the South Guangdong Model awards.

Professor Su led key projects supported by the National Eleventh Five-Year Plan Science and Technology Grant and the 14th Five-Year Plan National Key Program for Research and Development. His primary research areas include strategic planning and technical architecture for major engineering projects, structural and durability technologies for marine engineering, digitalization and intelligent construction, and intelligent operation and maintenance technologies for transport infrastructure, among others.

KEYNOTE SPEAKER

Prof Tang Xiaofeng
Associate Professor and Director of the Division of Engineering Education, Institute of Education & Associate Dean, National Graduate College for Engineers, Tsinghua University

REIMAGINING ENGINEERING EDUCATION FOR LEADING SUSTAINABLE INNOVATION

The landscape of engineering education is rapidly changing, driven by climate change, the fourth industrial revolution, and the evolving nature of engineering learning and practice. To meet the sustainability challenges facing humanity, we need to reimagine the education of engineers. This talk introduces Tsinghua University's recent and ongoing efforts to reimagine and reshape future engineering education. Driven by a philosophy that emphasizes the impact of education on students' values, capacity, and knowledge, the university has undertaken bold steps to restructure the undergraduate experience and create more diverse pathways of graduate education. These changes aim to educate outstanding interdisciplinary engineering researchers and competent leaders of innovation in the industry.

BIOGRAPHY

Xiaofeng Tang is Associate Professor and Director of the Division of Engineering Education in the Institute of Education and Associate Dean for the National Graduate College for Engineers at Tsinghua University. He teaches and conducts research in engineering education, engineering ethics, and STEM education. Dr. Tang is Associate Editor for *International Handbook of Engineering Education Research* and Assistant Editor for *Journal of Engineering Education*, and a former chair for the Engineering Ethics Division of American Society for Engineering Education (ASEE). He holds a Bachelor of Engineering degree in Automation from Tsinghua University and a Ph.D. in Science and Technology Studies from Rensselaer Polytechnic Institute. Prior to his current position, he was an assistant professor of practice in the Department of Engineering Education at The Ohio State University.

ABOUT SINGAPORE

Known for being clean and green, Singapore strives to be a sustainable urban destination. Through collective action and the Singapore Green Plan 2030, our city is reducing its impact on the environment with a limitless realm of possibilities for travellers from all walks of life.

About 95 percent of our city's energy is powered by natural gas, and over half our island is covered in lush trees and green foliage.

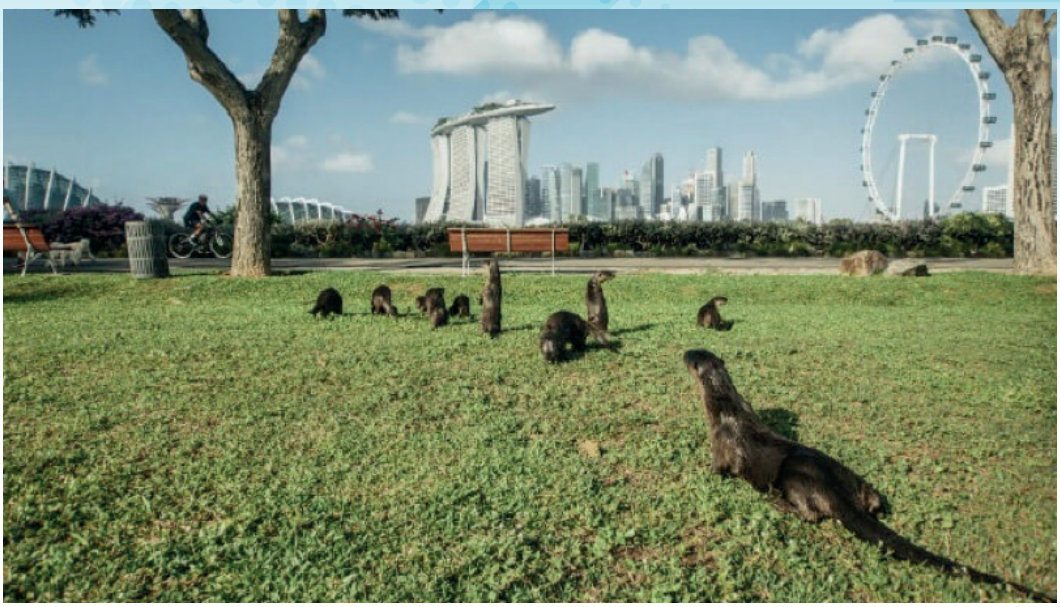
Whether you're a champion of sustainability visiting Singapore or keen to learn more about conserving nature, here're some of the many ways to get larger-than-life experiences while doing your part to protect our planet.

Exploring our City in Nature

Getting around our island can be easy and eco-friendly, with over 300 bus services and an extensive Mass Rapid Transit (MRT) system linking our many attractions. Whether you're exploring culture and heritage in Chinatown or checking into a hotel, your destination is never more than a short ride away.

ABOUT SINGAPORE

Tips for Sustainable Travel in Singapore



Besides transportation, there are many ways you can travel sustainably in The Lion City. Here are some quick and easy tips for both veteran travellers and first-time visitors to Singapore.

Know before you go

Do be sure to check out the official websites of the attractions you're visiting for essential information like peak hours and the do's and don'ts at each venue.

- Cultural attractions, heritage sites and places of worship may have their own guidelines for etiquette and dress codes.
- Our island boasts numerous ecosystems which double as havens to diverse flora and fauna. If you're visiting a park, nature reserve or sanctuary, some common guidelines to help protect our island's precious biodiversity include staying on designated walking paths and not smoking, which is prohibited at all public parks and gardens.
- From adorable otters to the Raffles Banded Langur and rare migratory birds, Singapore's greens spaces are the abodes for animals large and small. While it may be tempting to feed them, you may be doing more harm than good by disrupting an intricate ecosystem.
- Do feel free to admire our island's beautiful animals from afar and snap a photo or two, but take note that the trading of endangered species and the trapping of wild animals are against the law in Singapore.

Credits to Singapore Tourism Board: www.visitsingapore.com for all information above.

HOTEL INFO

The Robertson House by The Crest Collection

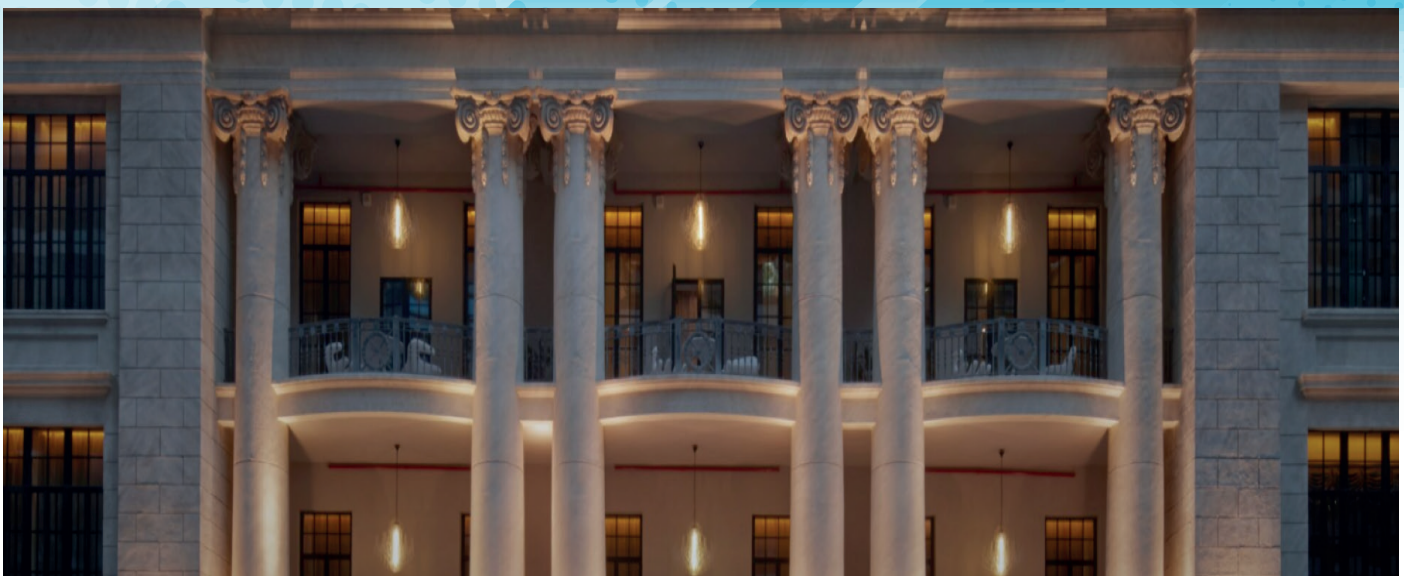
Owned by Ascott's sponsored lodging trust, CapitaLand Ascott Trust, The Robertson House by The Crest Collection takes its name from its prime location in Robertson Quay, named after Dr J Murray Robertson, a prominent Municipal Councillor during Singapore's colonial history. Situated along the historical Singapore River, the refurbished property will exude stately and oldworld colonial charm that harks back to the days of Singapore as a bustling entrepot trade hub. Conceptualised by Ascott's in-house design team, The Robertson House by The Crest Collection will serve as one of the brand's flagships in Asia.

The property's Head of the House will draw from Dr Robertson's natural flair and deep knowledge of Singapore's colonial past, to share the property's history and fables through the development of bespoke programmes, allowing guests to better appreciate the historical significance of the Singapore River and its pivotal role as the birthplace of Singapore's trade story.

The Robertson House's lounge, The 1823 Reading Room, will be decked in black and white, reminiscent of colonial bungalows. The lounge is inviting, exuding grandeur with an open and airy design. The lounge's name references the pursuit of education and knowledge since 1823 – when the history of libraries in Singapore began – and how people from all walks of life were encouraged to pass through the libraries' doors.

The property's other social areas such as the signature restaurant and destination bar will also be designed to reflect Singapore's colonial heritage, bringing together concepts and motifs that tell a meaningful and heartfelt local story that connects generations. Offering scenic city or river views, The Robertson House will provide 336 refurbished guest rooms and suites, incorporating motifs, fabrics and artistry that remind guests of Singapore's unique riverside story, where cultures and communities converged. Six themed suites will also be named after some of the most traded spices that came through Singapore's port.

HOTEL INFO



Hotel Telegraph

Hotel Telegraph, Singapore is an iconic 5-star luxury boutique hotel conveniently situated at the heart of the city-state's Central Business District – 35 Robinson Road, making it the perfect choice for business and leisure guests. Coupled with exceptional hospitality and state-of-the-art amenities, each of our 134 bespoke rooms and suites is exquisitely designed to provide you with an elegant yet comfortable stay.

Built in 1927 and designed by F.G. Lundon from Singapore's oldest architectural firm Swan and Maclaren, this 4-storey heritage building played an influential role in Singapore's telecommunications history for nearly a century. Accorded conservation status in 2000, it has housed numerous corporations and government entities, such as the Eastern Extension Telegraph Company, the Telecommunication Authority of Singapore, Singapore Telecom, Singapore Post, and advertising agency Ogilvy & Mather.

Today, the building has been beautifully restored and refurbished into a luxurious boutique hotel, whilst still retaining much of its captivating neo-classical façade and architecture. Be it on a romantic weekend staycation or an important business trip, indulge yourself at Hotel Telegraph, Singapore – where you will get to experience old-world allure blended with a contemporary twist at this quintessential city escape.

HOTEL INFO

Citadines Raffles Place

Citadines Raffles Place Singapore is ideally located in the core of the central business district. The serviced apartment is directly connected to the Raffles Place MRT interchange and a short distance from the Telok Ayer MRT Station. This makes the rest of the island a quick commute away.

Located within CapitaSpring, Citadines Raffles Place Singapore is set in the storied heart of the financial district. In the years after modern Singapore's founding in 1819, it became where traders from all over the world would congregate to do business. Two hundred years later, the area continues to buzz with commercial activities. A five-minute walk away is the vibrant Boat Quay, with a myriad of food, beverage and entertainment options. Equally accessible is the neighbourhood of Telok Ayer and Amoy Street, dotted by chic fitness studios, indie restaurants and cafes, and edgy cocktail bars.

Citadines Raffles Place Singapore serviced apartments is perfect for business or bleisure travellers looking to stay for a few nights or months in the city. Choose from eight different accommodation options spanning Studios, to One- and Two-Bedroom suites and lofts. Each includes versatile furniture pieces that seamlessly convert the spaces from a work to rest setting, as well as unique works by local artists specially commissioned for the serviced apartment.

More than just a serviced apartment, Citadines Raffles Place Singapore offers residents a well-balanced lifestyle and active exploration of the city through its signature programmes, activities and For The Love of Coffee.

PRESENTATION GUIDELINE & FULL PAPER PUBLICATION

PRESENTATION GUIDELINE

- Length of presentation material should be in accordance with the allocated time.
- Speakers are requested to load their presentation files before the session starts.
- Each paper presentation at the breakaway venues is limited to 15 minutes, which includes the questions and answers segment.
- Please refer to this programme book for actual presentation times.
- Speakers are kindly requested to be present in the relevant presentation venue (applicable to both in-person or virtual presentations) at least 10 minutes before the session starts.
- Each presentation room is equipped with a laptop computer with a data projector.
- Microsoft PowerPoint is the standard presentation format.
- The computers in the meetings rooms are provided to Window-based PC Users.
- Conference volunteers will be available to assist speakers should there be any technical difficulties.

FULL PAPER PUBLICATION

Organiser will reach out to co-authors of the paper via email to communicate on the guideline and specifications for submission of full paper after the event on 10 November 2023.

EXHIBITORS

LIST OF EXHIBITORS

Chinese Society of Engineers & The Hong Kong University of Science & Technology (Guangzhou)

JTC

Nanyang Technological University, Singapore

NUS College of Design and Engineering

The Institution of Engineers, Singapore

NOTE:

JULY 2024 INTAKE

Muhammad Hakim
Bin Ahmadjirony
School of Science and Technology

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