ICASS'2023

The 11th International Conference on Advances in Steel Structures

05 - 07 December 2023 | Kuching, Sarawak, Malaysia

Conference
Program Book

Host

The Hong Kong Polytechnic University 香港理工大學

Organisers

Swinburne University of Technology

香港鋼結構學會 Hong Kong Institute of Steel Construction www.hkisc.org

Co-organiser

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Host

The Hong Kong Polytechnic University 香港理工大學

Organisers

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Welcome Message

The Organizing Committee is delighted to extend a warm welcome to you for the eleventh International Conference on Advances in Steel Structures (ICASS'2023) in Kuching, Sarawak, Malaysia. This international conference series was initiated in 1996 by Chair Professor SL Chan from The Hong Kong Polytechnic University and organised by the Hong Kong Institute of Steel Construction, It is intended to provide a forum for researchers and professionals to discuss and disseminate recent advances in analysis, behaviour, design and construction of steel, aluminium and composite steel-concrete structures.

The first, second, third, sixth and ninth editions of this conference were held in Hong Kong, while the fourth was held in Shanghai, the fifth in Singapore, the seventh in Nanjing, the eighth in Lisbon, and the tenth in Chengdu. The eleventh ICASS'2023 will be unique, as it will be the first to be held in Kuching, Sarawak, Malaysia. Sarawak, the land of the Hornbills, is rich with cultural heritage and diverse ethics, and it is among the oldest rainforests in the world.

The conference includes keynote presentations and technical oral presentations. We hope this conference will give opportunities for sharing and exchanging ideas and promote new research initiatives.

Finally, we would like to extend our heartfelt gratitude to the sponsors, committee members, and, most importantly, the authors and participants. We wish all delegates an enjoyable ICASS'2023 experience and stay in Kuching, Sarawak!

Chairs

Ir Professor Siu-Lai CHAN

Ir Professor Hieng Ho LAU

Conference Organisation

Organising Committee

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B.S. How	Swinburne University of Technology, Sarawak, Malaysia
V. Andiappan	Swinburne University of Technology, Sarawak, Malaysia
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T.C.H. Ting	Curtin University Malaysia, Miri, Sarawak, Malaysia
T.T.Z. Ting	Curtin University Malaysia, Miri, Sarawak, Malaysia

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B. Young (HK, China)	Z.X. Yu (China)	L. Zhao (China)
O. Zhao (Singapore)	X.L. Zhao (HK, China)	R.D. Ziemian (USA)

Postgraduate Student Helper

A.P.S. Chai	S.R. Kho	G.Z.X. Lee	R.Z.C. Lim
S.A. Mrema	H.J. Ngui	E.L.Y. Law	J.B. Bong

General Tourist Information

About Kuching

Kuching is fondly known as the Cat City and capital city of Sarawak, the most densely populated city in Sarawak. Kuching was the administrative capital throughout the times of the Brunei sultanate, the White Rajahs of Sarawak, and during the British Colonial rule before Sarawak joined the Malaysian Federation in 1963. A unique blend of old meets new, Kuching offers an experience like no other. The rich history of the city is showcased throughout Kuching, as you can see various historical landmarks such as the Old Court House, the Astana, and Fort Margherita, dotted along the city's landscapes, telling tales of long ago that are still being passed down from generation to generation.

Kuching's Attractions

Carpenter Street
Recommended visiting time: Morning

Borneo Cultural Museum
Recommended visiting time: Afternoon

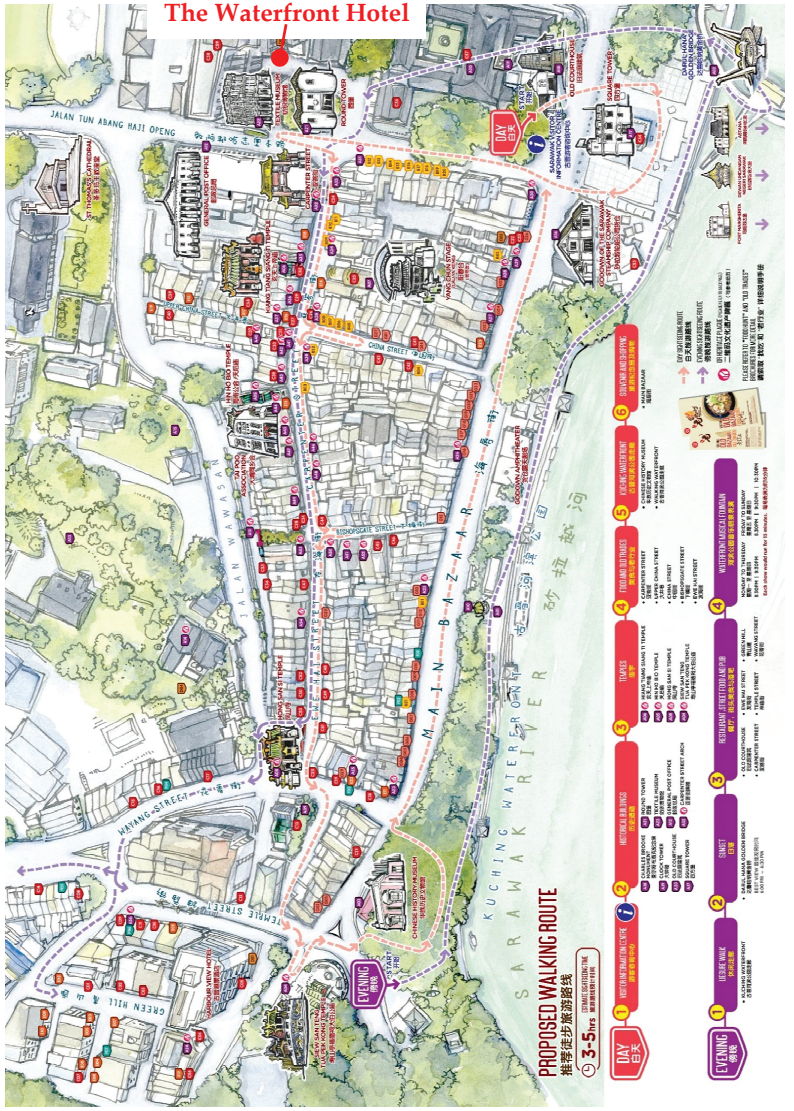
Darul Hana Bridge
Recommended visiting time: Evening

Old Bazaar

Discover Kuching

For the most up-to-date tourist information, please visit the website of the Borneo Exploration Tours and Travel at https://www.borneoexplorer.com.my.

The proposed walking route for the Old Bazaar area.



Prepared by: Kuching Old Market Community Association, https://kcholdbazaar.com/.

Transportation Information

Grab cars are plentiful throughout Kuching. They can be hailed through the smartphone apps. Scan the QR code to install the apps.

For Android

For iOS

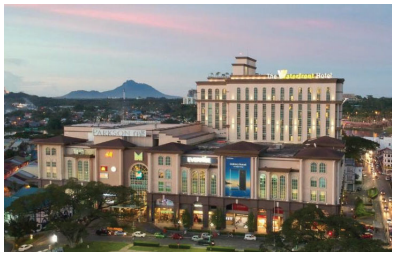
Other General Information

- Time zone: GMT+8
- Currency: Ringgit Malaysia (RM)
- Shopping Malls: 10:00 – 22:00
- Temperature: Average high 31°, Average low 23°

Emergency Number: 991

Conference Venues

The Waterfront Hotel



Website:

https://thewaterfrontkuching.com/

Address:

68, Jalan Tun Abang Haji Openg, 93000 Kuching, Sarawak, Malaysia.

For date:

- 5 December 2023, Tuesday
- 6 December 2023, Wednesday

Swinburne University of Technology Sarawak

Website:

https://www.swinburne.edu.my/

Address:

Jalan Simpang Tiga, 93350 Kuching, Sarawak, Malaysia.

For date:

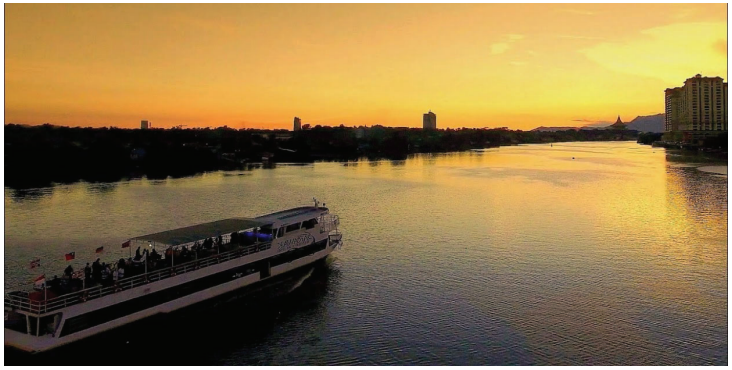
- 7 December 2023, Thursday

Welcome Reception (River Cruise)

Date: 5 December 2023

Venue: Register at 4th Floor, The Waterfront Hotel

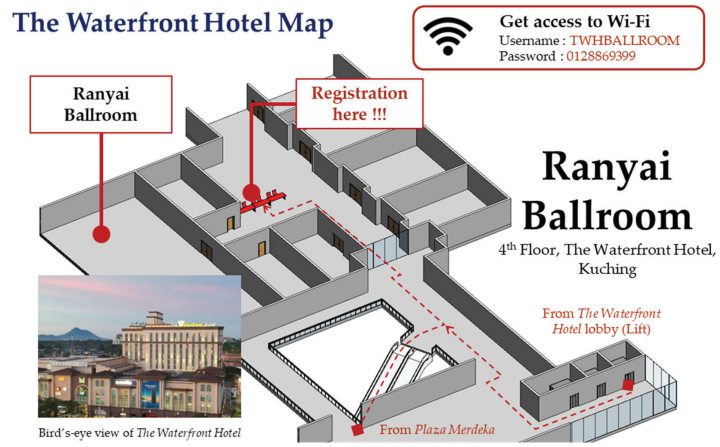
For those who indicated an interest in River Cruise, please register on 4th Floor, The Waterfront Hotel, between 4:00 p.m. and 5:00 p.m. The River Cruise ticket is on a first-come-first-serve basis.



Keynotes sessions and Gala dinner

Date: 6 December 2023

Venue: 4th Floor, The Waterfront Hotel



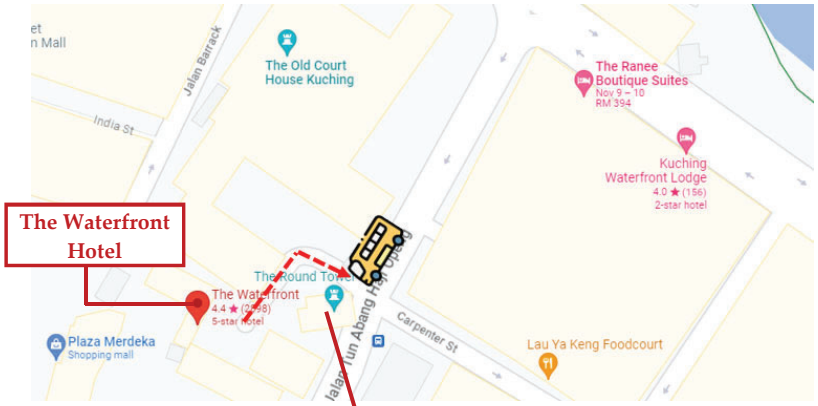
Shuttle Bus Services

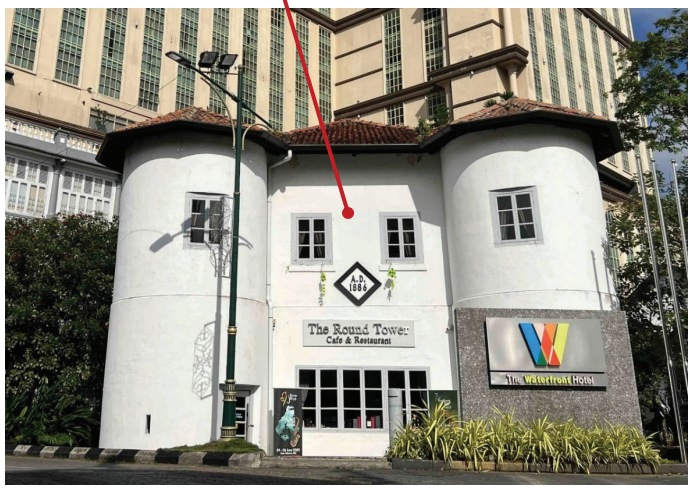
(From The Waterfront Hotel to Swinburne University of Technology Sarawak)

Date: 7 December 2023

Venue: Front gate of The Waterfront Hotel, near The Round Tower

The organising committee is providing the shuttle bus service on 7 December 2023, from The Waterfront Hotel to the Swinburne University of Technology Sarawak campus. The departure times are as follows: **7:30 a.m., 7:45 a.m., 8:00 a.m and 8:30 am.**





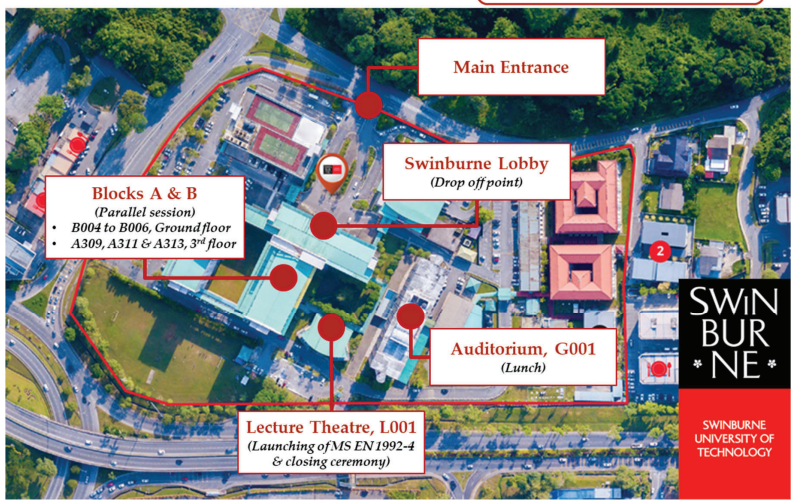
Parallel sessions

Date: 7 December 2023

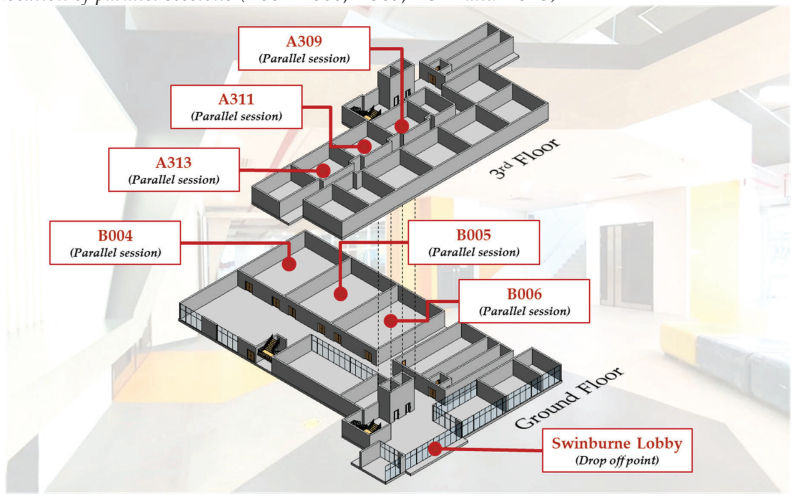
Venue: Swinburne University of Technology Sarawak Campus (SUTS)

Swinburne Sarawak Campus Map

Get access to Wi-Fi
Username : visitor01 or visitor04
Password : Nov@2023



Location of parallel sessions (B004-B006, A309, A311 and A313)



Conference Information

Instructions for Presenters

- Keynote speakers have 25 minutes for their presentation. The ideal slide aspect ratio for their presentations is 16:9.
- Regular presenters have 12 minutes for their presentation and 3 additional minutes for Q&A. The preferred slide aspect ratio for their presentations is 16:10. Please ensure that you transfer your PowerPoint file to the conference computer 5 minutes before the allocated parallel session starts and confirm that their presentation slides are functional on the conference computer.

Instructions for Session Chairs

- Arrive at the session room at least 5 minutes prior to the start time.
- Please remain in the session until it concludes.
- Confirm with the session helper that the speakers have no technical issues connecting their computers and using the projector screen.
- Coordinate the presentations in the parallel session.
- Provide a visual cue, such as a reminder board on the table, to the speaker 1 minute before the end of their presentation.

Technical Programme

Programme Overview

5 December 2023 (Tuesday)	
16:00 - 17:00	**EARLY REGISTRATION**
17:30 - 20:30	**Welcome Reception (*River Cruise*)**

6 December 2023 (Wednesday)	
7:30 - 8:30	**REGISTRATION** *Venue: Ranyai Ballroom, The Waterfront Hotel*
8:20 - 8:30	**SAFETY BRIEFING / HOUSEKEEPING**
8:30 - 9:00	**OPENING SESSION**
9:00 - 10:15	**KEYNOTE SESSION 1** Speaker 1: Professor Ben Young Speaker 2: Professor Brian Uy Speaker 3: Professor Emad Gad
10:15 - 10:45	**Coffee / Tea Break**
10:45 - 12:00	**KEYNOTE SESSION 2** Speaker 4: Professor Guo-Qiang Li Speaker 5: Professor J.Y. Richard Liew Speaker 6: Professor John L. Wilson
12:00 - 13:30	**Lunch**
13:30 - 14:45	**KEYNOTE SESSION 3** Speaker 7: Professor Kim J.R. Rasmussen Speaker 8: Professor Keh-Chyuan Tsai Speaker 9: Professor Leroy Gardner
14:45 - 15:15	**Coffee / Tea Break**
15:15 - 16:55	**KEYNOTE SESSION 4** Speaker 10: Professor Lin-Hai Han Speaker 11: Professor Luís Simões da Silva Speaker 12: Professor Ronald D. Ziemian Speaker 13: Professor Todd A. Helwig
16:55 - 17:00	**Closing of Keynote day**
19:00 - 19:30	**Reception** *Venue: Ranyai Ballroom, The Waterfront Hotel*
19:30 - 22:00	**GALA DINNER** *Venue: Ranyai Ballroom, The Waterfront Hotel*

7 December 2023 (Thursday)						
8:00 - 9:00	**REGISTRATION**					
8:45 - 9:00	**LAUNCHING OF MS EN 1992-4:2023** *Venue: L001, Swinburne University of Technology Sarawak*					
9:00 - 10:30	**PARALLEL SESSION 1**					
	1A *Venue: B004*	**1B** *Venue: B005*	**1C** *Venue: B006*	**1D** *Venue: A309*	**1E** *Venue: A311*	**1F** *Venue: A313*
	Cold-formed steel 1	Concrete filled tubular 1	Steel and modular structures	Earthquake engineering and structural dynamic	Steel connections 1	Fasteners
10:30 - 11:00	**Coffee / Tea Break**					
11:00 - 12:30	**PARALLEL SESSION 2**					
	2A *Venue: B004*	**2B** *Venue: B005*	**2C** *Venue: B006*	**2D** *Venue: A309*	**2E** *Venue: A311*	**2F** *Venue: A313*
	Cold-formed steel 2	Concrete filled tubular 2	Aluminium and temporary structures	Fire and other engineering 1	Steel connections 2	Welding technologies
12:30 - 14:00	**Lunch** *(Venue: G001)*					
14:00 - 15:30	**PARALLEL SESSION 3**					
	3A *Venue: B004*	**3B** *Venue: B005*	**3C** *Venue: B006*	**3D** *Venue: A309*	**3E** *Venue: A311*	**3F** *Venue: A313*
	Cold-formed steel 3	Concrete filled tubular 3	Special steel structure 1	Fire and other engineering 2	Steel connections 3	Parallel seminar
15:30 - 16:00	**Coffee / Tea Break**					
16:00 - 17:30	**PARALLEL SESSION 4**					
	4A *Venue: B004*	**4B** *Venue: B005*	**4C** *Venue: B006*	**4D** *Venue: A309*	**4E** *Venue: A311*	**4F** *Venue: A313*
	Structural steel	Composite walls	Special steel structure 2	Artificial intelligence & smart construction	Structural material	Parallel seminar
17:30 - 17:45	**CLOSING CEREMONY** *Venue: L001, Swinburne University of Technology Sarawak*					

Detailed Programme

6 December 2023 (Wednesday)	
7:30 - 8:30	**REGISTRATION** *Venue: Ranyai Ballroom, The Waterfront Hotel*
8:20 - 8:30	**SAFETY BRIEFING / HOUSEKEEPING**
8:30 - 8:35	**Speech by Ir. Professor Lau Hieng Ho**
8:35 - 8:40	**Speech by Professor SL Chan**
8:40 - 8:45	**Speech by Prof. Datuk Amar Dr. Sim Kui Hian**
8:45 - 9:00	**Opening of ICASS'2023**
KEYNOTE SESSION 1 *Venue: Ranyai Ballroom, The Waterfront Hotel*	
9:00 - 9:25	 **Cold-formed high strength steel tubular T- and X-joints** **Professor Ben Young** The Hong Kong Polytechnic University
	Professor Ben Young is Chair Professor of Steel Structures at The Hong Kong Polytechnic University. Professor Young's research interests include cold-formed steel structures, testing and design of steel structures, high-strength steel structures, stainless steel structures, aluminium structures, structural stability, fire resistance of metal structures and engineering education. He is currently a Co-Editor-in-Chief of the Journal of Constructional Steel Research.
9: 25 - 9:50	 **Australasian advances in steel-concrete composite bridge and building structures** **Professor Brian Uy** The University of Sydney
	Professor Brian Uy is Scientia Professor of Structural Engineering in the School of Civil and Environmental Engineering at the University of New South Wales. Brian has delivered over 100 plenary/keynote/invited lectures and has been involved in research in steel and composite structures for over 30 years. He has co-authored over 700 publications, including over 250 refereed journal articles. Brian is Chairman of the Standards Australia Committee BD-032 on Composite

	Building Structures and BD90-06 on Steel and Composite Bridge Structures. He is currently Vice President of the Institution of Structural Engineers (Australasia and South-East Asia) and the Australian Chairman of the International Association of Bridge and Structural Engineers. Brian is an elected Fellow of the Australian Academy of Technological Sciences and Engineering, Engineers Australia, Institution of Structural Engineers, Institution of Civil Engineers, American Society of Civil Engineers and the International Association of Bridge and Structural Engineers. He was awarded the Sir John Holland Civil Engineer of the Year Award in 2019 and the John Connell Gold Medal for Structural Engineering in 2021, both from Engineers Australia.
9:50 - 10:15	 **Application of blind bolts in steel moment connections** **Professor Emad Gad** Swinburne University of Technology
	Professor Emad Gad is the Dean of the School of Engineering at Swinburne University of Technology. He is a civil engineer with extensive experience in structural dynamics, residential construction and structural connections. His applied research has contributed to the development of several standards and codes of practice. He is the Chair of the Board of the Australian Engineered Fasteners and Anchors Council (AEFAC), Co-Editor of the Australian Journal of Structural Engineering, appointment member of the Victorian Government Building Advisory Council (BAC), Director on the Board of the Australian Steel Institute (ASI) and Fellow of Engineers Australia.
10:15 - 10:45	**Coffee / Tea Break**
KEYNOTE SESSION 2 *Venue: Ranyai Ballroom, The Waterfront Hotel*	
10:45 - 11:10	 **Early Warning of Fire-Induced Collapse of Steel Portal Frame Buildings** **Professor Guo-Qiang Li** Tongji University
	Professor Guo-Qiang Li is currently Professor at the College of Civil Engineering at Tongji University, a fellow of The Belgian Royal Flemish Academy of Sciences and Arts, the director of Research Centre of Education Ministry of China for Steel Construction and the director of National Research Centro of China for Pre-fabrication Construction. He is also a vice-chairman of Chinese Society of Steel Construction and a vice-chairman of Chinese Association of Construction Standardization. Professor Li's research has been mainly in the area of hazard

	mitigation for steel structures, including earthquake-resistance, fire-resistance and blast-resistance.
11:10 - 11:35	 **Innovative Steel-Concrete Composite Systems for Multistorey Modular Buildings** **Professor J.Y. Richard Liew** National University of Singapore Professor Richard Liew is Professor and Head of Department of Civil & Environmental Engineering at the National University of Singapore. He is a fellow of Singapore National Academy of Science, a Chartered Engineer in UK, a Professional Engineer in Singapore, and a Chartered Professional Engineer of the Association of Southeast Asian Nations. He is an Honorary Fellow and the Past President of Singapore Structural Steel Society. He serves on the editorial boards of 8 international journals. He is a key person responsible for the development of Singapore's codes of practices for steel structures and steel-concrete composite structures. He is at the forefront of pioneering research and educational initiatives in the domains of climate change mitigation and technologies associated with the advancement of smart city development.
11:35 - 12:00	 **Design of Steel Structures in regions of lower seismicity using displacement principles** **Professor John L. Wilson** Swinburne University of Technology Professor Wilson is Emeritus Professor at Swinburne University of Technology. He is the past joint recipient of four Chapman Medals and one Warren Medal. He was the Victorian Division Chairman of Engineers Australia in 2002, Chairman of Judges for the Victorian Engineering Excellence Awards since 2011, Chairman of BD6/11, the committee responsible for the earthquake-loading standard for Australia and a member of ACI307 Committee. He is an expert in structural systems, earthquake engineering, structural dynamics and has consulted widely in these fields.
12:00 - 13:30	**Lunch**
KEYNOTE SESSION 3 *Venue: Ranyai Ballroom, The Waterfront Hotel*	

13:30 - 13:55	 **Connections - the full-range Generalised Component Method** **Professor Kim J.R. Rasmussen** The University of Sydney Professor Kim Rasmussen is Challis Professor at the University of Sydney. He is also a member or chairman of numerous Standards Australia committees and a member of the editorial boards of most of the leading journals in his field. Kim's main research areas are theoretical and experimental structural mechanics, with particular expertise in various steel structural members and systems. He was awarded the 2016 Shortridge Hardesty Award by the Structural Engineering Institute for his contributions to the development of practical design provisions and advanced analysis guidelines in the field of structural stability.
13:55 - 14:20	 **Buckling-Restrained Braces using Truss-Frame as the Restrainer** **Professor Keh-Chyuan Tsai** Taiwan University Born in Taipei, Taiwan, Prof. Keh-Chyuan Tsai received his bachelor of science degree in civil engineering from Taiwan University (NTU) in 1977 and a master of science degree from Stanford University in 1980. From 1980 to 1984, he worked as a structural engineer in the San Francisco office of Skidmore Owings Merrill. He completed his Ph.D. degree at the University of California at Berkeley in 1988. Prof. Tsai is a registered civil and structural engineer in Taiwan and California, USA. He has joined the faculty members in the Department of Civil Engineering of NTU since 1989. Prof. Tsai served as the director of the NCREE from 2003 to 2010. He has conducted research for more than 30 years on design, testing and analysis of steel structures subjected to earthquake loads.
14:20 - 14:45	 **3D Printed Steel – Exploring Opportunities for Optimised and Hybrid Structures** **Professor Leroy Gardner** Imperial College London Professor Leroy Gardner is Professor of Structural Engineering at Imperial College London. His principal research interests, in respect of which he has co-authored five textbooks and some three hundred papers, lie in the areas of structural testing, numerical modelling and the development of design guidance for steel structures. He is a member of the European and BSI Committees responsible for Eurocode 3 and Fellow of both the Institutions of Civil (FICE) and Structural (FIStructE) Engineers. He is Editor-in-Chief of Structures and the International Journal Steel Structures. Professor Gardner was awarded the IABSE Prize in 2017.

14:45 - 15:15	**Coffee / Tea Break**
KEYNOTE SESSION 4 *Venue: Ranyai Ballroom, The Waterfront Hotel*	
15:15 - 15:40	 **Concrete-filled double skin steel tubular (CFDST) structures: research, application and standard** **Professor Lin-Hai Han** Tsinghua University Professor Han is the first and second-level candidate of the first batch of National Millions of Talents Project, Chair Professor of Chang Jiang Scholars Program of the Ministry of Education, and the Chief Scientific Communication Expert of the Country. Professor Han won the Outstanding Contribution Award of the China Steel Construction Society Association for Steel-Concrete Composite Structures (CSCS-ASCCS). He is the Associate Editor of several international journals, including Journal of Structural Engineering, Structures and China Civil Engineering Journal. His research interests include encased and mixed structures.
15:40 - 16:05	 **Design and behavior of beam-to-column joints connected to the column web or the faces of a tubular column** **Professor Luís Simões da Silva** University of Coimbra Professor Luis Simões da Silva is Professor of Steel Construction at the University of Coimbra. He is also the president of CMM (Portuguese Steelwork Association, chair of the Technical Management Board of ECCS (2007-2013) and president of ECCS (2011-2013). He involves in large number of Technical and Scientific Committees in the field of Steel Construction, and actively involved in many internationally-funded R&D projects. He is also the author of more than six hundred scientific papers in peer-reviewed journals and conferences.
16:05 - 16:30	 **Design of Steel Structures with Nonsymmetric Sections by the Direct Analysis Method** **Professor Ronald D. Ziemian** Bucknell University Professor Ron Ziemian serves on the American Institute of Steel Construction, American Iron and Steel Institute, and Aluminum Association Specification Committees. His research on applying advanced methods of computational analysis to better design for the stability behavior of metal structures has been

	recognized with several awards, including the ASCE Norman Medal, ASCE Shortridge Hardesty Award, AISC Special Achievement Award, AISC TR Higgins Award, and SSRC Lynn Beedle Award. Ron is currently Co-Editor-in-Chief of the Journal of Constructional Steel Research.
16:30 - 16:55	 **Effective Stability Bracing for Steel Girder Systems** **Professor Todd A. Helwig** University of Texas at Austin Professor Todd Helwig is an international expert on the stability aspects of bridge construction with a focus on the design and behavior of steel structures. His research has been recognized with several awards including the ASCE Collingwood Research Prize, the ASCE Moisseiff Award, and the ASCE Shortridge Hardesty Award. Professor Todd's work on stability bracing systems in steel bridges was recognized at the North American Steel Construction Conference with a Special Achievement Award. He was also recently selected as the recipient of the 2017 T. R. Higgins Lectureship Award from AISC.
16:55 - 17:00	**Closing of Keynote day**
19:00 - 19:30	**Reception**
19:30 - 22:00	**GALA DINNER** *Venue: Ranyai Ballroom, The Waterfront Hotel*

7 December 2023 (Thursday)	
8:45 - 9:00	**LAUNCHING OF MS EN 1992-4** *Venue: L001, Swinburne University of Technology Sarawak*

9:00 - 10:15	**Parallel Session 1A: Cold-formed steel 1** *Venue: B004* Chair: Fiona Walport & Ajeesh S.S		
	ID	**Paper**	**Presenter**
9:00 - 9:15	16	Effect of damage induced imperfection on steel hollow section compression member strength	Kenny Mudenda
9:15 - 9:30	88	Experimental study on the structural behaviour of scissor frame structures under point loads	Jian Jun Moy
9:30 - 9:45	114	Strength enhancement and cross-section behavior of cold-formed steel elliptical hollow sections with steel grades up to 960MPa	Wai-Meng Quach
9:45 - 10:00	130	Experimental investigation on local buckling of cold-formed steel SHS columns and beams	Xiaxin Wang
10:00 - 10:15	173	Effects of perforation on circular steel hollow sections	A Punitha Kumar

9:00 - 10:15	**Parallel Session 1B: Concrete filled tubular 1** *Venue: B005* Chair: Brian Uy & Meini Su		
	ID	**Paper**	**Presenter**
9:00 - 9:15	41	Ultra-high-strength concrete-filled steel tubular stub columns under axial compression: experiment and simulation	Ci Song
9:15 - 9:30	57	Experimental analysis of built-up cold-formed steel stub column filled with fibre-reinforced foam concrete under axial compression	Mohd Syahrul Hisyam Mohd Sani
9:30 - 9:45	62	Strength of reinforced modified fibrous foam concrete-filled steel hollow section	Norashidah Abd Rahman
9:45 - 10:00	67	Numerical analysis and seismic evaluation of composite frames with diagonal-ribs stiffened concrete filled steel tubes	Zheng Zhou
10:00 - 10:15	86	Experimental study into stub square concrete-filled steel tubes under uniaxial compression	Pengfei Men

9:00 - 10:15	**Parallel Session 1C: Steel and modular structures** *Venue: B006* Chair: Richard J.Y. Liew & Cher Siang Tan		
	ID	**Paper**	**Presenter**
9:00 - 9:15	161	A proposed framework for module planning of steel modular hospital buildings	Hwa Jiat Ngui
9:15 - 9:30	184	Compression properties of a new inter-module connection system for high-rise steel modular buildings	Yan Duan
9:30 - 9:45	214	Resilient seismic design of fully modular steel buildings based on controlled rocking with superelastic tendon restraint	Hing-Ho Tsang
9:45 - 10:00	282	Lateral failure mechanisms of volumetric buildings: An experimental study	Robert Z. C. Lim
10:00 - 10:15	233	Progressive collapse analysis of hybrid type modular structures: A case study	Yue-Yang Ding
1015 - 1030	264	Direct analysis of steel frames with asymmetrical semi-rigid joints	Jake Chan

9:00 - 10:30	**Parallel Session 1D: Earthquake engineering and structural dynamic** *Venue: A309* Chair: John Wilson & Jiaji Wang		
	ID	**Paper**	**Presenter**
9:00 - 9:15	34	Numerical simulations of the cyclic behavior of buckling restrained energy dissipative rod	Yun-Long Zhong
9:15 - 9:30	61	Experimental data towards constitutive relationship of Fe-SMA under monotonic and cyclic loading	Zhe-Xi Zhang
9:30 - 9:45	112	Collapse assessment of an innovative built-up steel tubular column through multi-axis cyclic and hybrid simulation tests	Javad Hashemi
9:45 - 10:00	129	Seismic fragility assessment of concrete-filled composite plate shear walls designed in accordance with AISC 360-22	Mostafa Fathi Sepahvand
10:00 - 10:15	165	On response of cold-formed steel storage racks subjected to base excitations	Umeshkumar Mourya
10:15 - 10:30	281	Vibration and comfort analysis of spiral steel staircases: Methods and insights	Yao-Peng Liu

9:00 - 10:15	**Parallel Session 1E: Steel connections 1** *Venue: A311* Chair: Hieng-Ho Lau & Jian-Wei He		
	ID	**Paper**	**Presenter**
9:00 - 9:15	48	The high-cycle fatigue performance of shear connections between LQ550 steel sheets using self-tapping screws and blind rivets	Yaqian Wang
9:15 - 9:30	49	Enhanced robustness of bolted beam-to-column connections equipped with stainless steel bolts and angles	Yuchen Song
9:30 - 9:45	56	Study on ultimate resistance formula of high-strength frictional bolted joints made of high-strength steel	Zice Qin
9:45 - 10:00	106	Serviceability design method of a cold-formed steel welded moment connection using a welded clip-angle and flange-cleat	Mahendrakumar Madhavan
10:00 - 10:15	125	Feasibility of European proprietary self-tapping connecting screws: Adoption & application in-line with Australian national construction codes (NCC)	Andrew Whyte
10:15 - 10:30	167	Experimental investigation of high-strength thin-walled cold-formed steel single-lap shear screw-fastened connections under cyclic loading with different screw arrangements	Tina Ting Chui Huon / Hieng-Ho Lau

9:00 - 10:30	**Parallel Session 1F: Fasteners** *Venue: A313* Chair: Emad Gad & Daniel Looi		
	ID	**Paper**	**Presenter**
9:00 - 9:15	58	Performance of shallow embedded cast-in lifting anchors in early age concrete	Jessey Lee
9:15 - 9:30	59	Tensile behaviour of redundant non-structural fasteners: Experimental and numerical investigations	Tilak Pokharel
9:30 - 9:45	72	Assessment and Design of fastenings using MS EN 1992-4	Michael Roessle
9:45 - 10:00	111	Design of cast-in anchor channels in accordance with MS EN 1992-4	Sayed Daher
10:00 - 10:15	123	Comparative testing of threaded anchor rods supplied by different manufacturers	Raymond W. S. Chong
10:15 - 10:30	145	Anchor fastening design in concrete for Malaysia based on the commentary handbook for MS EN 1992-4	Lieu Thai Ng

10:30 - 11:00	**Coffee / Tea Break**

11:00 - 12:30	**Parallel Session 2A: Cold-formed steel 2** *Venue: B004* Chair: Kim R.J. Rasmussen & Andi Su		
	ID	**Paper**	**Presenter**
11:00 - 11:15	33	Cross-sectional behaviour of high strength steel hexagonal hollow section stub columns under combined compression and bending	Junzhi Liu
11:15 - 11:30	60	Design method of local-distortional interaction buckling capacity of stainless steel lipped C-section columns	Jiahui Zhao
11:30 - 11:45	156	The effect of sectional thicknesses on the behaviour of cold-formed steel lipped channels under axial reversed cyclic loading: A numerical investigation	Shin Rui Kho
11:45 - 12:00	240	Direct analysis of steel members with nonsymmetric sections accounting for geometric and material nonlinearities	Wenlong Gao
12:00 - 12:15	243	Sophisticated second-order analysis of steel members with nonsymmetric cross-sections and semi-rigid connections	Hao-Yi Zhang
12:15 - 12:30	50	Reliability analysis of cold-formed steel components	Jessey Lee

11:00 - 12:30	**Parallel Session 2B: Concrete filled tubular 2** *Venue: B005* Chair: Lin-Hai Han & Man-Tai Chen		
	ID	**Paper**	**Presenter**
11:00 - 11:15	194	Innovations within the second generation of Eurocode 4	Stephen Hicks
11:15 - 11:30	66	Analysis and design of partially concrete-filled steel tubular columns considering shear connection degree	Dan Gan
11:30 - 11:45	81	Design method of stub and slender T-shaped irregularly concrete-filled steel tube column under combined axial load and bending moment	Wang-Hui Liu
11:45 - 12:00	104	Investigation of load transfer from infill concrete to steel tube in CFST square columns with headed shear studs	Partha Pratim Debnath
12:00 - 12:15	222	Recent advances in concrete column strengthening with steel encasement	Kai-Leung Ray Su
12:15 - 12:30	236	The influence of axial compression ratio on the hysteretic behavior of high strength concrete filled high strength square steel tubular columns	Zengmei Qiu

11:00 - 12:30	**Parallel Session 2C: Aluminium and temporary structures** *Venue: B006* Chair: Todd A. Helwig & Wai-Meng Quach		
	ID	**Paper**	**Presenter**
11:00 - 11:15	181	Engineering applications and research progress of low-rise aluminum alloy frames	Xinhang Zhi
11:15 - 11:30	19	Bearing capacities of scaffold systems with extended jack bases and under inclined formworks	Jui-Lin Peng
11:30 - 11:45	94	Design and application of modular lightweight construction platform for high-rise core	Linxu Liao
11:45 - 12:00	124	A fine design method for the disk-buckled scaffolding structure based on direct analysis	Lijun Wang
12:00 - 12:15	244	Direct analysis method for design of modern steel structures with irregular cross-sections	Siwei Liu
12:15 - 12:30	528	TechnoLab™ - Experiential platform for deep learning of engineering statics, mechanics & dynamics	Nicholas Haritos

11:00 - 12:30	**Parallel Session 2D: Fire and other engineering 1** *Venue: A309* Chair: Guo-Qiang Li & Yaopeng Liu		
	ID	**Paper**	**Presenter**
11:00 - 11:15	15	Testing of post-fire resistance for selected stainless steel grades used in construction	Mariusz Maslak
11:15 - 11:30	17	Temperature development of steel columns subjected to localized fires: Experimental study and calculation method	Er-Feng Du
11:30 - 11:45	39	Behavior of concrete-filled fire-resistant steel tubular columns subjected to axial compression load and fire	Meiling Chen
11:45 - 12:00	54	The prediction of temperatures for steel members protected by intumescent coatings under non-uniform heating conditions	Qing Xu
12:00 - 12:15	87	Influence of thermal history assuming fire damage on mechanical properties of steels for bridge high performance structure	Koki Matsubara
12:15 - 12:30	263	Mechanical properties and fracture behavior of welded Q345 structural steel after high-temperature cooling	Chuntao Zhang

11:00 - 12:15	**Parallel Session 2E: Steel connections 2** *Venue: A311* Chair: Wei Li & Bao Meng		
	ID	**Paper**	**Presenter**
11:00 - 11:15	65	Tightening properties of non-projected and sandglass-shaped bolt with high strength and durability	Masashi Takayama
11:15 - 11:30	76	Numerical investigation on a demountable stainless steel bar connection under shear load	Jiachen Guo
11:30 - 11:45	77	Effects of strain rate on thin sheet steel single shear bolted connections	Yancheng Cai
11:45 - 12:00	150	Finite element analysis on shear lag of channel tension members with bolted connection	Ajeesh S S
12:00 - 12:15	188	Stainless steel member-to-gusset plate connections: Tests, numerical modelling and design	Ke Jiang

11:00 - 12:30	**Parallel Session 2F: Welding technologies** *Venue: A311* Chair: Ben Young & Yuner Hwang		
	ID	**Paper**	**Presenter**
11:00 - 11:15	46	Investigating the mechanical properties of TMCP Q690 in the heat-affected zone using welding thermal simulation	Zhe Sun
11:15 - 11:30	52	Experimental and numerical study on high cycle fatigue damage evolution of Q690D high strength steel welding details	Liang Zong
11:30 - 11:45	91	Numerical simulation of welding residual stress at thick steel plate joints	Xiong He
11:45 - 12:00	100	Residual stress reduction for corner parts of sole plate welds in steel bridge girders by local heating	Hiroto Nakatani
12:00 - 12:15	149	Influence of welded-patch plate size on deformation and residual stress of thickness-reduced steel plates	Takehito Hashiguchi
12:15 - 12:30	197	Influence of HAZ on the failure of single-sided welded T-joints made of high-strength steels	Richard Stroetmann

12:30 - 14:00	**Lunch** *Venue: G001, Swinburne University of Technology Sarawak*

14:00 - 15:15	**Parallel Session 3A: Cold-formed steel 3** *Venue: B004* Chair: Siwei Liu & Adeline Ng		
	ID	**Paper**	**Presenter**
14:00 - 14:15	74	Experimental study on behaviour of cold-formed steel built-up joints with bolted connections	Zhanhong Li
14:15 - 14:30	83	Axial strength of back-to-back built-up cold-formed steel unequal angle sections	Beulah Gnana Ananthi. G
14:30 - 14:45	107	Experimental study of bi-angled Z-sections for retrofitting transmission tower legs	Gorripotu Kishorekumar
14:45 - 15:00	118	Numerical investigation on connections in sheathed cold-formed steel frames	Nikolas Ringas
15:00 - 15:15	132	Influence of connection detailing in cold-formed steel frames sheathed with fibre-cement boards	Yuner Huang

14:00 - 15:30	**Parallel Session 3B: Concrete filled tubular section 3** *Venue: B005* Chair: Leroy Gardner & Tilak Pokharel		
	ID	**Paper**	**Presenter**
14:00 - 14:15	45	An overview on the behaviour of concrete-filled tube girders	Jane Regita Joseph
14:15 - 14:30	64	Research on residual bearing capacity and damage assessment method of concrete filled steel tube columns under impacting	Baoxin Qi
14:30 - 14:45	95	Numerical study on the square high-strength concrete-filled square high-strength steel tubular members under impact load	Runze Liu
14:45 - 15:00	103	Experimental study on the flexural behavior of pre-engineered high-performance steel-concrete composite beam	Bo Yang
15:00 - 15:15	204	Tensile performance of bolted connection for CFDST columns	Wei Li
15:15 - 15:30	226	Flexural behavior of reinforced hollow high strength concrete filled square steel tube	Zhijian Yang

14:00 - 15:30	**Parallel Session 3C: Special steel structure 1** *Venue: B006* Chair: Keh-Chyuan Tsai & Lei Zhao		
	ID	**Paper**	**Presenter**
14:00 - 14:15	68	In-plane stability of new spoke-arch with double hubs under uniformly distributed vertical load	Pumsakheyna Chea
14:15 - 14:30	92	Study and application of deeply buried corrugated steel arches in China	Hao-Jun Sun
14:30 - 14:45	98	A decision-making method for rockfall flexible protection systems: A case study of Western China	Lijun Zhang
14:45 - 15:00	99	Study on the impact cushioning performance of a modular composite buffering structure used for steel rockfall sheds	Yuntao Jin
15:00 - 15:15	166	Prediction on frictional action for stacked steel disc springs with low initial cone angle	Yukun Ding
15:15 - 15:30	271	Assessment of debris-resisting capacity of a rockfall flexible barrier	Jian-Wei He

14:00 - 15:30	**Parallel Session 3D: Fire and other engineering 2** *Venue: A309* Chair: Ronald D. Ziemian & Hing-Ho Tsang		
	ID	**Paper**	**Presenter**
14:00 - 14:15	43	Simulation and prediction of fracture behavior of 6082-T6 aluminium alloy under monotonous and cyclic load	Mingze Wu
14:15 - 14:30	134	Numerical investigation for local-distortional interaction buckling of cold-formed steel flexural members exposed to fire	Ravikant Singh
14:30 - 14:45	31	Study on breeze vibration mechanism of oblique material of UHV steel pipe tower	Liyan Feng
14:45 - 15:00	232	Wind load characteristics of construction formwork on porous surface of high-rise building	Huan He
15:00 - 15:15	227	Experimental and numerical study on crack propagation of glass under blast load	Xiaohong Guo
15:15 - 15:30	241	Second-order analysis method for pile-supported structures accounting for nonlinear soil-structure interaction	Weihang Ouyang

14:00 - 15:15	**Parallel Session 3E: Steel connections 3** *Venue: A311* Chair: Luís Simões da Silva & Yancheng Cai		
	ID	**Paper**	**Presenter**
14:00 - 14:15	14	Anticorrosive performance and relaxation property of high-strength bolts with hexagonal, cup and countersunk head	Hitoshi Moriyama
14:15 - 14:30	101	Durability evaluation of repaint-coating on steel with initial paint-coating removed by induction heating	Sota Inoue
14:30 - 14:45	198	Fatigue assessment of stainless steel bolted joints for coastal structures	Jia Wang
14:45 - 15:00	199	Load slippage characteristics of bolted and welded shear connections in prefabricated composite beams	Yan Ding
15:00 - 15:15	278	Evaluation of bolted shear connector used in cold-formed steel lightweight concrete (CFS-LWC) composite beams	Rohola Rahnavard

15:30 - 16:00	**Coffee / Tea Break**

16:00 - 17:15	**Parallel Session 4A: Structural steel** *Venue: B004* Chair: Ou Zhao & Zengmei Qiu		
	ID	**Paper**	**Presenter**
16:00 - 16:15	44	Structural behaviour and CSM-based design approach of S960 ultra-high strength steel non-slender welded I-sections under combined loading	Andi Su
16:15 - 16:30	63	Equivalent geometric imperfections for GMNIA-based design of beam-columns	Fiona Walport
16:30 - 16:45	109	Microstructural and mechanical behavior of 3D printed high strength steel	Man-Tai Chen
16:45 - 17:00	122	Evaluation of plastic geometry factor ηpl for SENB specimens based on plane strain and three-dimensional finite element analyses	Sun Tong
17:00 - 17:15	126	Research progress on mechanical properties of H-beam with flange openings	Ying Lin

16:00 - 17:30	**Parallel Session 4B: Composite walls** *Venue: B005* Chair: Kai-Leung Ray Su & Partha Pratim Debnath		
	ID	**Paper**	**Presenter**
16:00 - 16:15	18	Comparison on buckling mechanism and restraining panel design between conventional and T-hooked buckling-restrained steel plate shear walls	Jing-Zhong Tong
16:15 - 16:30	40	Comparison on axial resistant behaviour of multi-celled corrugated-plate composite walls using different interval members	Chao-Qun Yu
16:30 - 16:45	85	Design methods of corrugated steel plate shear walls under combined compression and shear loads	Chen-Bao Wen
16:45 - 17:00	158	Experimental study on seismic performance of steel tube-corrugated steel plate composite walls	Sixian Zhang
17:00 - 17:15	159	Research on overall stability of steel tube-corrugated steel plate composite walls under axial compression	Xinjie Li
17:15 - 17:30	272	Simulation analysis of seismic performance of inclined stiffened corrugated steel plate shear wall	Ming Xie

16:00 - 17:15	**Parallel Session 4C: Special steel structure 2** *Venue: B006* Chair: Dan Gan & Lijun Wang		
	ID	**Paper**	**Presenter**
16:00 - 16:15	136	Inelastic behavior of a proposed sub-structure for plastic design of steel staggered truss framing systems	Zexiang Li
16:15 - 16:30	256	Feasibility of new generation high strength cold-formed steel for construction industries	Cher Siang Tan
16:30 - 16:45	93	Numerical analysis of composite subframe with large-web-openings against progressive collapse	Bao Meng
16:45 - 17:00	218	Research on the influence of edge column restraint strength on the anti-collapse performance of composite structures	Yang Li
17:00 - 17:15	230	Force transmission characteristics in supporting ropes of flexible rockfall barriers	Lei Zhao

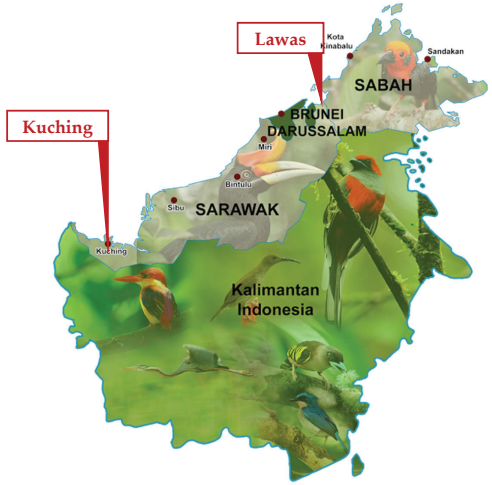
16:00 - 17:30	**Parallel Session 4D: Artificial intelligence & smart construction** *Venue: A309* Chair: Siwei Liu & Er-Feng Du		
	ID	**Paper**	**Presenter**
16:00 - 16:15	168	Deep-learning-based model for efficient simulation of steel and concrete in structures	Jiaji Wang
16:15 - 16:30	171	Research progress on data-driven prediction methods for CFST using optimized machine learning models	Chao Hou
16:30 - 16:45	231	Data-driven-based fully automatic rockfall impact force reconstruction for flexible barrier systems	Xiaoyu Yang
16:45 - 17:00	242	Emerging machine-learning techniques for second-order analysis of steel members through physics-informed neural networks	Guanhua Li
17:00 - 17:15	250	Embodied carbon assessment for steel structures	Yuyang Wang
17:15 - 17:30	261	Fast safety assessment of glass panels under diverse boundary conditions using machine learning	Wenfeng Chen

16:00 - 17:30	**Parallel Session 4E: Structural material** *Venue: A311* Chair: Chuntao Zhang & Bo Yang		
	ID	**Paper**	**Presenter**
16:00 - 16:15	20	Fatigue behavior of P91 steel: Experimental, mathematical and numerical study	Halina Egner
16:15 - 16:30	23	Energy equivalence based estimation of metal matrix composites mechanical properties	Anna Jerzyńska
16:30 - 16:45	24	Overload retardation of Q420C hot-rolled steel and an improved retardation model	Meini Su
16:45 - 17:00	80	Ductile fracture behaviour of S690 high strength steel under monotonic tensile actions	Mengfei Li

17:30 - 17:45	**CLOSING CREREMONY** *Venue: L001, Swinburne University of Technology Sarawak*

A UNESCO heritage – the Lun Bawang Beads

In Sarawak, beads are an integral part of the culture for the natives, symbolising status and wealth. The Lun Bawang ('Lun' means people, 'Bawang' means local) ethnic is indigenous in Long Tuma village, Lawas (northern region of Sarawak).



The Lun Bawang beads are handmade; gather and process the clay taken from the riverbed of Lawas River, pound and knead the clay into a desired shape (i.e., elongated, round, and concave oval), dried and baked for five hours, paint the underglaze pattern after cooling, and baked in a kiln for another eight hours. Each bead pattern has its name and motive. These motives are based on natural sources (such as flora and fauna), animal elements, alphabet (such as *S* symbol), and shape (such as heart). The uniqueness of the production process and bead motives make these Lun Bawang beads unique and have their own aesthetic value.

It is proud to highlight that Lun Bawang beads were published in a documentary by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). At this conference, these unique Lun Bawang beads are strung together into a lanyard as tokens of souvenirs; Brown for organising committee members; Blue for keynote speakers; Red for sponsors; and Green for participants.

Contact Information

If you have any questions about the conference, please contact the organising committee secretariat via the emails:
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The official website: https://www.icass2023.org/