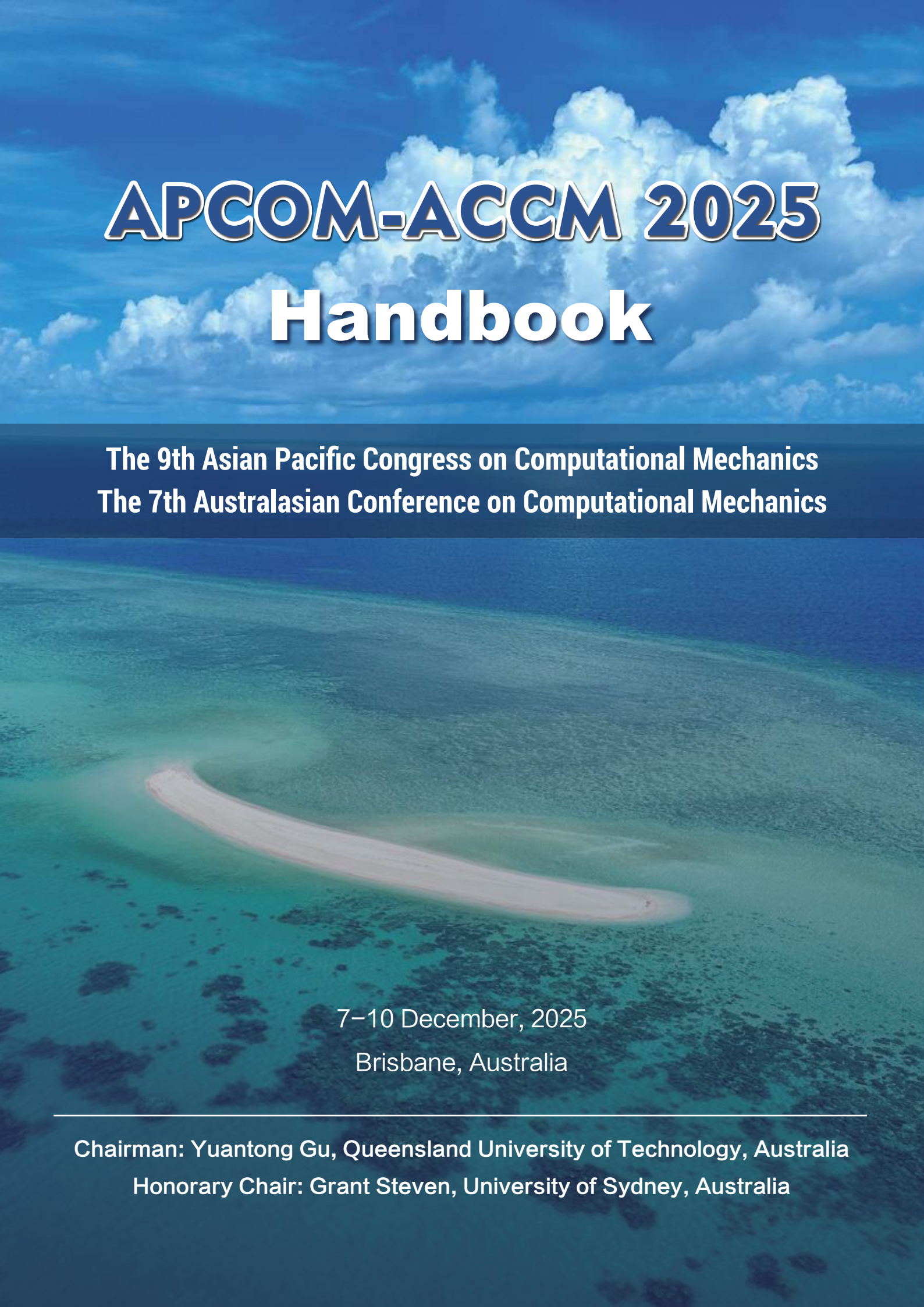
APCOM-ACCM 2025

Handbook

The 9th Asian Pacific Congress on Computational Mechanics
The 7th Australasian Conference on Computational Mechanics



7–10 December, 2025

Brisbane, Australia

Chairman: Yuantong Gu, Queensland University of Technology, Australia

Honorary Chair: Grant Steven, University of Sydney, Australia

ACKNOWLEDGEMENT OF TRADITIONAL OWNERS

QUT acknowledges the Turrbal and Yugara, as the First Nations owners of the lands where QUT now stands. We pay respect to their Elders, lores, customs and creation spirits. We recognise that these lands have always been places of teaching, research and learning.

QUT acknowledges the important role Aboriginal and Torres Strait Islander people play within the QUT community.

Conference Organisation

Conference Hosts

Queensland University of Technology (QUT), Australia

Conference Organisers

Queensland University of Technology (QUT), Australia

Asian Pacific Association for Computational Mechanics (APACM)

Australian Association for Computational Mechanics (AACM)

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Welcome Message

Dear Colleagues and Friends,

On behalf of the Organising Committee, it is my great pleasure to welcome you to the 9th Asian Pacific Congress on Computational Mechanics and the 7th Australasian Conference on Computational Mechanics (APCOM-ACCM 2025), held here in beautiful Brisbane, Australia. The APCOM-ACCM 2025 Congress is co-organised by the Asian Pacific Association for Computational Mechanics (APACM) and the Australian Association for Computational Mechanics (AACM).

This joint congress brings together an exceptional gathering of scholars, engineers, and industry leaders from across the world to exchange ideas and showcase the latest developments in computational mechanics and its multidisciplinary applications. We are delighted to welcome over 650 participants from 27 countries and regions, making this one of the largest international meetings in computational mechanics ever held in Australia.

We are privileged to host an outstanding lineup of plenary and semi-plenary speakers, including some of the world's most distinguished experts who have made remarkable contributions to the field. Their insights will inspire new directions of thought and collaboration for the next generation of computational mechanics research.

The successful organisation of a congress of this scale would not be possible without the generous support of our sponsors and partners.

I would also like to extend my heartfelt thanks to every member of the Local Organising Committee, whose dedication and professionalism have made this event possible.

I wish you an inspiring and rewarding congress experience filled with stimulating discussions, new collaborations, and lasting friendships. May your time here also allow you to enjoy the warm hospitality, natural beauty, and cultural richness of Australia.

Professor Yuantong Gu
Conference Chairman
Queensland University of Technology, Australia

General Information

Conference Venue

Venue: Brisbane Convention & Exhibition Centre (BCEC)
Address: BCEC, Grey St, South Brisbane QLD 4101

Registration

The registration desk will be open at the Plaza Foyer of the BCEC during:
7th December 12:00 – 19:00
8th December 7:30 to 17:30
9th December 7:30 to 17:30
10th December 7:30 to 13:00

Catering

Please check the program overview for catering information. On 7th December, a welcome reception will be hosted in Plaza Terrace Room (PTR) of BCEC from 18:00 to 20:00. From 8th December to 10th December, morning tea, lunch and afternoon tea will be provided in each day in the Plaza foyer of BCEC. The Congress Banquet will be held on 9th December from 19:00 to 22:00 in Plaza Terrace Room of BCEC

Internet

In BECE, free WIFI is provided. You can add the WIFI below to your devices.

WIFI: BCECLINK
No Password Required

Congress supporting staff

During the Congress, the local organising team will allocate relevant supporting staff. They are volunteers. During the event, they will wear Black T-Shirt as shown below. If you need any support or have any questions, they are the best persons for you to contact.

Front

Back

Presentation Guideline

Presenters should upload their slides to the laptop with a USB in the presentation room. This should be done **prior to** the session start.

Presentation types and time allocation

During the three-day program, there are various type of presentations scheduled. The types and their allocated length are listed in the table below

Presentation type	Plenary	Semi-plenary	Invited	Regular
Duration (mins)	50 (including Q&A)	40 (including Q&A)	20 (including Q&A)	15 (including Q&A)

Presenters

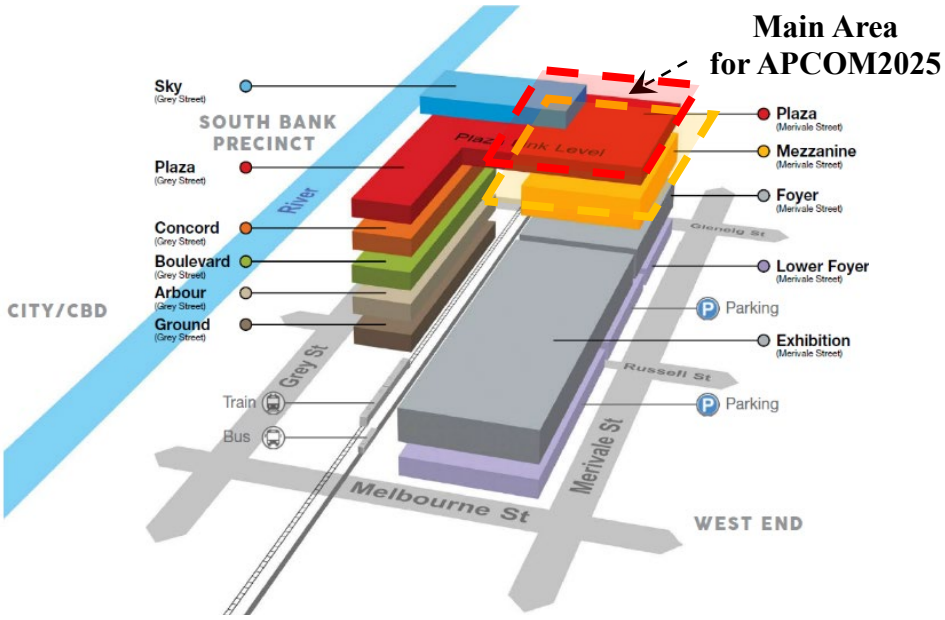
Presenters are expected to complete their slides and bring them to the Congress with a USB. It is required that relevant presentation slides must be uploaded by the presenters to the PC in their presentation room prior to the session start. For example, presenters should use the tea break and lunch break to upload slides to the computer in their presentation venue before their presentation session start.

If you would like to improve your slides and need a venue for you to prepare during Congress, you can use the Board Room 2 located on the Foyer level. From Plaza level and Mezzanine level, you can use the escalator to access to Foyer level. Or seek support from the Congress supporting staff who are wearing black T-shirt.

Presentation session chairs

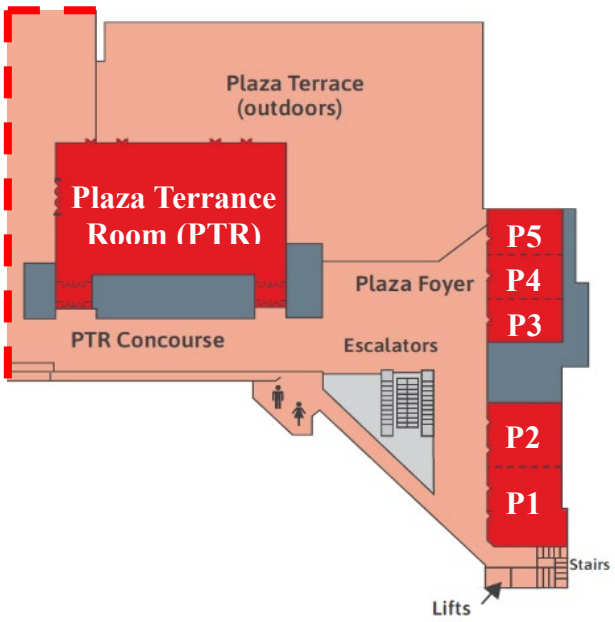
Chairs are the coordinators in their assigned presentation session. It is expected that Chairs will support presenters to upload slides and chair the session (both presentations and Q&As) to have a smooth running of the session. They are also expected to keep timing during presentations. If any technical issues (e.g. IT issue) happen during presentation, they are expected to work with the allocated supporting staff wearing black T-shirt in their venue.

Floor Maps of Brisbane Convention & Exhibition Centre

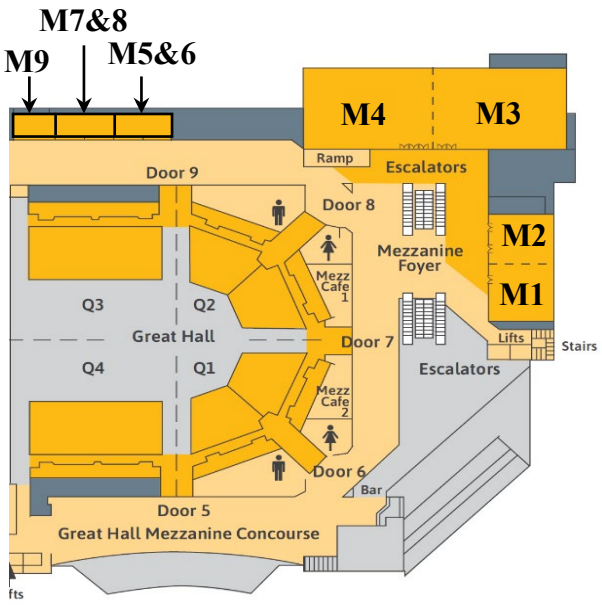


Conference rooms include:

PTR	P1	P2	P3	P4	P5	M1	M2	M5&6	M7&8	M9	M3	M4



Plaza Level



Mezzanine Level

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Program Overview

Room	PTR	P1	P2	P3	P4	P5	M1	M2	M5&6	M7&8	M9	M3	M4
Day 0 (07/12)													
12:00 - 19:00	Registration												
14:00 - 16:00	HDR/ECR in computational mechanics @ P1						Women in computational mechanics @ P2						
18:00 - 20:00	Welcome Reception												
Day 1 (08/12)													
Plenary Talk (50 mins include Q&A) / Semi-Plenary Talk (40 mins include Q&A)							Parallel Session (PS)						
08:00 - 08:50	Opening Speeches @ PTR												
08:50 - 10:30	Plenary Talk 1 @ PTR												
	Plenary Talk 2 @ PTR												
10:30 - 10:50	Morning Tea @ Plaza foyer												
10:50 - 12:30	A1-1	B1-1	C1-1	D1-1	E1-1	F1-1	G1-1	H1-1	I1-1	J1-1	K1-1		
12:30 - 13:30	Lunch @ Plaza foyer												
13:30 - 14:50	Semi-Plenary Talk @ PTR				Semi-Plenary Talk @ P1				Semi-Plenary Talk @ P2				
	Semi-Plenary Talk @ PTR				Semi-Plenary Talk @ P1				Semi-Plenary Talk @ P2				
14:50 - 15:10	Afternoon Tea @ Plaza foyer												
15:10 - 16:50	A1-2	B1-2	C1-2	D1-2	E1-2	F1-2	G1-2	H1-2	I1-2	J1-2	K1-2		
16:50 - 17:00	Short Break												
17:00 - 18:30	A1-3	B1-3	C1-3	D1-3	E1-3	F1-3	G1-3	H1-3	I1-3	J1-3	K1-3		
Day 2 (09/12)													
08:00 - 10:30	Plenary Talk 1 @ PTR												
	Plenary Talk 2 @ PTR												
	Plenary Talk 3 @ PTR												
10:30 - 10:50	Morning Tea @ Plaza foyer												
10:50 - 12:30	A2-1	B2-1	C2-1	D2-1	E2-1	F2-1	G2-1	H2-1	I2-1	J2-1	K2-1	M2-1	N2-1
12:30 - 13:30	Lunch @ Plaza foyer												
13:30 - 14:50	Semi-Plenary Talk @ PTR				Semi-Plenary Talk @ P1				Semi-Plenary Talk @ P2				
	Semi-Plenary Talk @ PTR				Semi-Plenary Talk @ P1				Semi-Plenary Talk @ P2				
14:50 - 15:10	Afternoon Tea @ Plaza foyer												
15:10 - 16:50		B2-2	C2-2	D2-2	E2-2	F2-2	G2-2	H2-2	I2-2	J2-2	K2-2	M2-2	N2-2
16:50 - 17:00	Short Break												
17:00 - 18:30		B2-3	C2-3	D2-3	E2-3	F2-3	G2-3	H2-3	I2-3	J2-3	K2-3	M2-3	N2-3
18:30 - 19:00	Break												
19:00 - 22:00	Banquet @ PTR												
Day 3 (10/12)													
08:00 - 10:30	Plenary Talk 1 @ PTR												
	Plenary Talk 2 @ PTR												
	Plenary Talk 3 @ PTR												
10:30 - 10:50	Morning Tea @ Plaza foyer												
10:50 - 12:30	A3-1	B3-1	C3-1	D3-1	E3-1	F3-1	G3-1	H3-1	I3-1	J3-1	K3-1		
12:30 - 13:30	Lunch @ Plaza foyer												
13:30 - 14:20	Plenary Talk 4 @ PTR												
14:20 - 15:00	Semi-Plenary Talk @ PTR				Semi-Plenary Talk @ P1				Semi-Plenary Talk @ P2				
15:00 - 15:20	Afternoon tea @ Plaza foyer												
15:20 - 16:50	A3-2	B3-2	C3-2	D3-2	E3-2	F3-2	G3-2	H3-2	I3-2	J3-2	K3-2		

Note: Plaza Terrace Room (PTR)

Plenary Speakers

Advanced Design and Manufacturing of Stent-grafts for the Treatment of Aortic Diseases

Fangsen Cui
Institute of High Performance Computing (IHPC), Agency for Science, Technology and Research (A*STAR), Singapore
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ABSTRACT: Endovascular stent-graft repair is a minimally invasive treatment for aortic diseases, yet current devices face limitations in curved anatomical regions like the aortic arch—where device maladaptation can lead to complications such as endoleaks, migration, or structural collapse. To address these challenges, we present a novel metamaterial-based stent-graft designed for enhanced conformability in complex geometries. Leveraging patient-specific 3D printing, we manufactured this next-generation device and hypothesize it will enable safer, more effective total endovascular arch repair with reduced complication rates. This work highlights the sustainable and resilient development of the stent-graft, focusing on its metamaterial design and additive manufacturing process. Our results demonstrate a simple, effective, and fully endovascular solution for aortic arch pathologies, bridging a critical gap in vascular intervention technology

Dr. Fangsen Cui is a Senior Principal Scientist at the Institute of High Performance Computing (IHPC), A*STAR, Singapore. He holds a B.S. (1984) and M.Eng. (1989) from Xi'an Jiaotong University and a Ph.D. from the National University of Singapore (2001). His research spans mechanics, acoustics, and biomechanics, with a focus on computational and applied mechanics.

Dr Cui was the recipient of the International Computational Investigator Award in 2019, the IES Prestigious Engineering Achievement Award in 2021, and the Singapore Long Service Medal in 2024. Fangsen is active in both academic and society activities: He is the co-editor or in the editorial board for a few journals. He is the General Council Member of International Association for Computational Mechanics (IACM, from 2012), Executive Council Member of Asia-Pacific Association for Computational Mechanics (APACM, from 2018), Fellow of International Association of Applied Mechanics (IAAM 2020), Standing Executive Board Member of the International Society of Mechanical System Dynamics (ISMSD 2023), and the President of SACM from 2017.

Multiscale Mechanics of Cells and Biological Tissues

Xi-Qiao Feng
Tsinghua University
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ABSTRACT: Some experimental and theoretical researches conducted by the speaker's group on the multiscale biomechanics of biological tissues and cells at multiple length scales will be introduced. Particular attention is given to the biomechanical mechanisms underlying the morphogenesis of developing embryos and tumors. First, a multiscale chemomechanical model and the corresponding computational method are presented for studying the dynamic behaviors of a single cells and interconnecting collective cells. Second, we investigate the dynamic instability that occur in biological systems at different tempospatial scales and involve mechanical, biological and chemical coupling mechanisms. Third, we address, both experimentally and theoretically, the migration of collective cells. On the basis of experimental measurements and theoretical analysis, time-independent statistical laws are derived.

Keywords: Cell, biological tissue, Mechnobiology, Multiscale modeling

Dr. Xi-Qiao Feng is a Chang Jiang Chair Professor and Head of the Department of Engineering Mechanics at Tsinghua University.

He earned his B.Sc. (1990), M.Sc. (1991) and Ph.D. (1995) degrees in Solids Mechanics from Tsinghua University at Beijing. From September 1997 to May 1999, he was awarded the Alexander von Humboldt of Germany and worked at the Technical University of Darmstadt and Delft University of Technology. He rejoined Tsinghua University as an associate Professor in 1999 and was promoted to a full professor in 2001.

Selected Feng's honors include: Award of Science and Technology for Young Scientists of China (2007), Distinguished Young Scholars Award of NSFC (2005), Young Scientist Award of Fok Ying Tong Education Foundation (2004), Award for Best Doctoral Theses of China (1999).

Currently, he is the Secretary-General of the Chinese Society of Theoretical and Applied Mechanics (CSTAM) and Director of the Institute of Biomechanics and Medical Engineering (IBME). He also serves as a member of the editorial board of more than 10 international journals, such as Applied Physics Letters, Journal of Applied Physics, Molecular and Cellular Biomechanics, Engineering Fracture Mechanics, and Archive of Applied Mechanics.

Professor Feng's current interests include: molecular and cellular biomechanics, mechanics of biomaterials, damage and fracture mechanics.

He has authored and co-authored two books and more than 200 journal papers. See the section entitled "Selected Publications" assoicated with the link, "Prof. Yanping Cao" for some of his published citations

Conquering Generalization Challenges in AI - enhanced Computational Mechanics: Thoughts and Practices

Xu Guo[1,2*]

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[2] *Ningbo Institute of Dalian University of Technology, Ningbo 315016, China*

Email: guoxu@dlut.edu.cn

ABSTRACT: Artificial Intelligence (AI) has become an active research frontier in computational mechanics, a field characterized by complex physical phenomena and diverse engineering scenarios. Conventional end-to-end AI models often demonstrate strong performance on specific datasets; however, they tend to suffer a marked decrease in generalization capability when confronted with unfamiliar boundary conditions, material properties, or geometric configurations. To overcome this limitation, a problem-independent machine learning (PIML) framework has been developed to enhance large-scale structural analysis and topology optimization. The core idea centers on revisiting the foundation of the finite element method—the shape function. Specifically, machine learning is employed to construct an implicit mapping between the material distribution within coarse mesh elements and their corresponding numerical Green's functions. As a result, the proposed PIML method is genuinely independent of particular analysis or optimization settings, since the numerical shape functions of coarse mesh elements are uniquely defined by their internal material layout, independent of external loads, boundary conditions, or the design domain's geometry and topology. Numerical experiments confirm that the algorithm improves optimization efficiency by two orders of magnitude for topology optimization problems involving millions of degrees of freedom in three dimensions, compared to mainstream commercial software under equal computational resource constraints. In a parallel computing environment using 6750 cores, each iteration of a 3D topology optimization with 10 billion degrees of freedom requires only 42 seconds. Looking forward, this approach lays the groundwork for a next-generation universal CAE software platform that integrates AI with classical numerical methods, paving the way for more efficient and intelligent engineering simulation and design.

Professor Xu Guo, a member of the Chinese Academy of Sciences, is from the Dalian University of Technology, P.R. China. He once served as the Vice President of the Chinese Society of Theoretical and Applied Mechanics and the President of the Chinese Association of Computational Mechanics. Currently, he is the Vice President of International Society for Structural and Multidisciplinary Optimization, and one of the editorial board members of Computer Methods in Applied Mechanics and Engineering and International Journal for Numerical Methods in Engineering.

Xu Guo has been working in the field of computational mechanics, solid mechanics and structural optimization for more than 25 years. He has published more than 270 SCI papers in renowned scientific journals including JMPS, CMAME, PRL, Nature Material and Science. He is the recipient of numerous academic awards and honors, including the ASSMO Award, ICACM Award, etc. He is also the Plenary/Semi-Plenary speaker in numerous prestigious international conferences/workshops/symposiums, including the 2016 World Congress on Computational Mechanics (WCCM).

Law-Based and Data-Based Methods: Stability Issues Revisited with PINNs

Guirong Liu
University of Cincinnati, USA
Email: liugr@ucmail.uc.edu

ABSTRACT: Machine learning methods such as Artificial Neural Networks (ANNs) [1][2] and Physics-Informed Neural Networks (PINNs)[3], have been successfully applied to a broad range of problems in science and engineering. Recently, the author proposed TrumpetNets and TubeNets [4][5] two novel classes of two-way deep networks trained using the standard Finite Element Method (FEM) [6], the Smoothed Finite Element Method (S-FEM) (S-FEM) [7], and PINN formulations based on partial differential equations (PDEs). These approaches have been applied to static, dynamic, linear, and nonlinear mechanics problems [3].
This talk explores the fundamental differences between law-based and data-based methods, focusing on their underlying principles, computational procedures, predictive capabilities, and key properties across various problem categories. Insights into the stability characteristics of these two classes of methods are presented, highlighting that techniques effective for one may not necessarily perform well for the other.

References

[1] Liu GR, Machine Learning with Python: Theory and Applications, World Scientific, in printing, 2021.
[2] Liu GR, A Neural Element Method, IJCM 17 (07), 2050021, 2020.
[3] Liu GR, PINN with Python: An Introduction, ScienTech Publisher, 2025.
[4] Liu GR, S.Y. Duan, Z.M. Zhang and X. Han, TubeNet: A Special TrumpetNet for Explicit Solutions to Inverse Problems, International Journal of Computational Methods (IJCM), in printing (2020).
[5] Liu, GR, FEA-AI and AI-AI: Two-Way Deepnets for Real-Time Computations for Both Forward and Inverse Mechanics Problems, IJCM, Vol. 16, No. 08, 1950045 (2019).
[6] Liu G.R., and Quek, S.S., Finite Element Method: a practical course, BH, Burlington, MA, 2003.
[7] Liu G.R. and Nguyen-Thoi T, Smoothed Finite Element Methods, CRC Press: Boca Raton, 2010.

GR Liu received his Ph.D. from Tohoku University, Japan, in 1991. He was a Postdoctoral Fellow at Northwestern University, USA, from 1991–1993. He was a Professor at the National University of Singapore until 2010. He is currently a Professor at the Department of Aerospace Engineering and Engineering Mechanics, University of Cincinnati, USA. He was the Founder of the Association for Computational Mechanics (Singapore) (SACM) and served as the President of SACM until 2010. He served as the President of the Asia-Pacific Association for Computational Mechanics (APACM) (2010–2013) and an Executive Council Member of the International Association for Computational Mechanics (IACM) (2005–2010; 2020–2026). He authored over 600 journal papers and more than 15 books, including two bestsellers, Mesh Free Method: Moving Beyond the Finite Element Method and Smoothed Particle Hydrodynamics: A Meshfree Particle Methods. He is the Editor-in-Chief of the International Journal of Computational Methods and served as an Associate Editor for IPSE and MANO. He is the recipient of numerous awards, including the Singapore Defence Technology Prize, NUS Outstanding University Researcher Award, NUS Best Teacher Award, APACM Computational Mechanics Award, JSME Computational Mechanics Award, ASME Ted Belytschko Applied Mechanics Award, Zienkiewicz Medal from APACM, AJCM Computational Mechanics Award, Humboldt Research Award, and SACM Medal from the Association of Computational Mechanics (Singapore). He has been listed as one among the world's top 1% most influential scientists (Highly Cited Researchers) by Thomson Reuters for a number of years. Google citations: ~65000, h-index: 118.

Machine Learning Based Solutions of PDE with Applications in Engineering and Mechanics

Timon Rabczuk
Bauhaus University Weimar, Germany
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ABSTRACT: This presentation highlights recent advancements in Scientific Machine Learning (SciML) for modeling physical systems governed by partial differential equations (PDEs). It will first compare and present an overview of SciML approaches including Physics-Informed Neural Networks (PINNs), Deep Energy Methods (DEMs) and Neural Operators for analyzing mechanical problems. Then, two advanced neural operator frameworks will be introduced: one for static problems and one for dynamic problems. For static PDEs, the Variational Physics-Informed Neural Operator (VINO) combines the generalization power of neural operators with the accuracy and stability of energy-based formulations. VINO minimizes the variational form of PDEs rather than pointwise residuals, enabling training without labeled data and significantly improving performance over existing machine learning methods, particularly as mesh resolution increases. Its element-based discretization enhances scalability and physical fidelity, addressing key limitations in existing physics-informed models. For dynamic problems, we present the so-called Step Aware Neural Operator (SANO), designed for efficient multi-step predictions in time-dependent PDEs. SANO incorporates time-step-specific projections and message-passing mechanisms, capturing long-term dependencies while avoiding error accumulation, and demonstrates strong performance across a range of phase field models. Finally, a hybrid approach will be proposed that uses the output of neural operators as an initial guess for iterative solvers, significantly improving the computational time for challenging problems by combining data-driven prediction with the robustness of numerical methods.

Timon has graduated at University of Karlsruhe in January 2002 and spend almost 4 years as postdoctoral fellow at the Computational Mechanics group of Prof. Ted Belytschko in Northwestern University before joining the University of Munich. In 2007, he was appointed Senior Lecturer in the Mechanical Engineering Department at University of Canterbury in New Zealand before recruited as chaired professor of Computational Mechanics at Bauhaus University Weimar in 2009. He has published more than 800 papers in international SCI journals and is on editorial boards of several journals. He is member of the European Academy of Sciences, Academia Europaea and European Academy of Sciences and Arts. His key research area is Computational Mechanics with particular focus on computational methods for the solution of PDEs with applications in Engineering,
Mechanics and materials science.

Two-Scale Analysis of Composite Materials Using Surrogate Computational Homogenization

Kenjiro Terada
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ABSTRACT: A class of surrogate computational homogenization (SCH) using radial basis function (RBF) interpolation has recently been proposed to perform two scale analyses of inelastic composite materials. The idea behind the RBF-based SCH is to replace the microscopic analysis in the FE^2 computation with a surrogate model created by radial-basis interpolation approximation using the dataset composed of results obtained obtained from a series of numerical material tests. The method has been applied to composite materials consisting of rate-independent elastoplastic materials within the small and finite strain frameworks, and rate- and temperature-dependent viscoelastic materials, and is guaranteed to be sufficiently accurate. However, the computational cost of the process of obtaining the weights of RBFs by solving linear equations with the kernel matrix as coefficients is high, and this approach has been applied only to two-dimensional (2D) problems. In this study, various sampling methods and interpolation methods will be investigated and their application to 3D problems will be realized. If it can be applied to 3D problems, it will be available to practitioners through implementation in general-purpose FEM software, and it is expected to expand the range of applications, such as topology optimization for anisotropic inelastic materials.

Dr. Terada is Professor at The Department of Civil and Environmental Engineering. He has published more than 360 peer-reviewed papers in domestic and international journals, four Japanese textbooks, and many other papers in the field of computational mechanics and CAE. He has received numerous awards, including The IACM Fellows Awards from the IACM (2014) and the Kawai Medal from the Japan Society for Computational Engineering and Science (2014). Dr. Terada is currently the President of IACM (2022-Present), and is the former President of JSCES (2016-2017FY). In addition to these various activities in academia, he renders a service on adult education for CAE engineers and practicians as the President of the Japan Association for Nonlinear CAE.

The main thrust of Dr. Terada's research is computational homogenization methods and related mathematical modeling of heterogeneous materials. Dr. Terada's major contribution in this context is the proposal of a general class of algorithms for nonlinear homogenization, which has been further extended theoretically and applied to various engineering problems. The last decade has also seen a renewed interest in hyper-complex disaster simulation for disaster hazard estimation using various computational methods such as particle methods, data science, etc. At the same time, practical applications of computational homogenization methods to enable practitioners to perform various multi-scale finite element analyses in their CAE work. More recently, research interest has shifted to computational mechanics accelerated by quantum computers.

On Spectral Element Methods for the Analysis of Acoustic and Mechanical Metamaterials

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ABSTRACT: Acoustic and mechanical metamaterials are novel and artificially designed materials or structures exhibiting extraordinary wave propagation properties that cannot be found in natural or conventional materials. They have become a research hotspot and highlight of great interest in recent years. The analysis of the wave propagation problems in acoustic and mechanical metamaterials typically relies on the numerical methods to determine their band structures (dispersion relations) or transmission spectra. Among many numerical methods, the finite element method (FEM), time-domain finite difference method (TDFDM), boundary element method (BEM), plane wave expansion method (PWEM), and meshless method (MLM) are particularly common, while the spectral element method (SEM) is rarely used, despite its numerous advantages and superior features. In this presentation, two different SEMs extremely suitable for the numerical analysis of acoustic and mechanical metamaterials will be reported, namely, the Doyle-type SEM and the Patera-type SEM. The Doyle-type SEM uses the exact solutions of the equations of wave motion to construct the shape or interpolation functions and to derive the corresponding spectral element matrix. Its semi-analytical nature results in an extremely high computational accuracy and efficiency, but its applicability is primarily limited to one-dimensional (1D) wave propagation problems. On the other hand, the Patera-type SEM, which is in fact a higher-order FEM, is suited not only for 1D but also for two-dimensional (2D) and three-dimensional (3D) wave propagation problems. The conventional FEM typically uses low-order shape functions and uniform node distributions, whereas the Patera-type SEM utilizes higher-order Lagrangian shape functions and a Gauss-Legendre-Lobatto (GLL) node distribution. Several numerical examples will be shown to demonstrate the advantages and disadvantages, accuracy and efficiency of the two different SEMs for computing the band structures (dispersion relations) and transmission spectra of acoustic and mechanical metamaterials.

Professor Chuanzeng Zhang has received his PhD in 1986 at the TU Darmstadt, Germany. From 1986 to 1988, he was a postdoc with Professor Jan D. Achenbach at the Department of Civil Engineering, Northwestern University, USA. Before his appointment as Professor at the Ningbo University (China) in 2024, he was Associate Professor and Professor at the Department of Engineering Mechanics of the Tongji University (China), Professor at the Department of Civil Engineering, University of Applied Sciences Zittau/Görlitz (Germany), and Professor at the Department of Civil Engineering, University of Siegen (Germany). His research interests include computational mechanics, structural mechanics, acoustic and mechanical metamaterials, and mechanics of smart materials and structures. He has published 2 monographs and over 650 papers in peer-reviewed scientific journals with 25,000 citations and h-index 78 (Google Scholar). He is Co-Chief Editor of a book series, Associate Editor of 3 international journals, Advisory Editor, Guest Editor and Editorial Member of over 10 other scientific journals. He is Adjunct Professor, Guest Professor, Consulting Professor and Honorary Professor of over 10 universities. He was awarded as honorary doctorate (Dr. honoris causa) of Slovak University of Technology in Bratislava, honorary doctorate (Dr. honoris causa) of Aristotle University of Thessaloniki, member of European Academy of Sciences, member of European Academy of Sciences and Arts, and member of Academia Europaea.

Structural Behaviour of Composite Structures Under Projectile and Laser Impact

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ABSTRACT: Composite materials such as carbon fibre reinforced polymers (CFRP) have been used widely in various engineering applications including aircrafts and marine structures due to their light weight, high strength, fatigue resistance and other superior mechanical properties. This keynote presentation will introduce the start-of-the-art numerical modelling frameworks developed for predicting the structural and damage behaviour of composites subjected to extreme loading including laser irradiation and projectile impact. The characteristics and application of composite structures including composite laminates and sandwich panels with laminate as skin and aluminium foam as core are introduced first. The numerical modelling of composite sandwich panels subject to high velocity projectile impact will be presented along with the experimental studies which are used to validate the numerical model. Next, the numerical modelling framework for composite laminates under laser irradiation will be presented, and the experimental work used to validate the numerical model is also introduced. Finally the coupled thermal and mechanical model based on a finite element framework in COMSOL Multiphysics to model the laser paint stripping of carbon fibre reinforced polymer (CFRP) will also be covered in this presentation. The removal of protective coatings from composite structure surfaces is a critical challenge in aerospace maintenance and repair operation. The developed model provides insights into temperature distribution, ablation depth, and the coupled thermo-mechanical effects within the paint layers and CFRP substrate, facilitating efficient and damage-free paint removal from CFRP substrates using the optimal laser parameters. The effectiveness and robustness of numerical modelling in predicting the structural damage and analysing and understanding the insight and mechanism of composite structures under complex extreme loadings are well demonstrated.

Keywords: Composite structures, impact, laser irradiation, numerical modelling

Prof. Yixia (Sarah Zhan) is Fellow of Australian Academy of Technological Science and Engineering, Head of School of Mechanical and Mechatronic Engineering and Professor in Engineering at Faculty of Engineering and Information Technology at University of Technology Sydney. Before she moved to the current position in March 2025, she worked for six years at Western Sydney University (WSU) as Professor of Engineering in School of Engineering, Design and Built Environment. At WSU, she worked in multiple leadership roles at the university and school level including Deputy Chair/Acting Chair of Academic Senate, founding co-director of the Centre for Advanced Manufacturing Technology, and Discipline Lead of Civil and Environmental Engineering. She worked in the University of New South Wales for 15 years staying 12 years in UNSW Canberra. She received her PhD on Structural Engineering from the University of Hong Kong in 2001. Prof. Zhang has been serving as the member of Australian Research Council (ARC) College of Expert since 2021. She is the editor of Construction and Building Materials, chair of Engineering Australian Joint Civil/Structural Sydney Committee and Executive Committee member for Australian Computational Mechanics Association.

Prof. Zhang is a research leader in construction sustainability and structural resilience and has strong expertise in advanced composite materials and structures including construction and building materials in Civil Engineering and composites in Mechanical and Aeronautical Engineering. She has published 1 book, 4 edited books, 24 book chapters and over 410 peer-reviewed scholarly research papers with 220 in top international journals till April 2025. She was the recipient of a several major national research excellence awards.

Fluid Mechanics and Artificial Intelligence

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ABSTRACT: Fluid mechanics has long played a vital role in aerospace and other fields, revealing the basic laws of fluid motion and providing a solid theoretical foundation for engineering design. With the rapid development of science and technology, especially the rise of artificial intelligence technology, the combination of this emerging technology and fluid mechanics will open up a new research paradigm.
With its powerful data processing capabilities, pattern recognition capabilities, and optimization algorithms, artificial intelligence provides unprecedented opportunities to solve multi-scale, nonlinear, and uncertain problems in fluid mechanics. Our research team actively explores how to deeply integrate artificial intelligence and fluid mechanics to explore more efficient and accurate flow modeling, optimization and control methods for aerospace engineering design and development.
The lecture will address the applications of machine learning techniques to fluid dynamics system problems, including key issues such as flow field prediction, aerodynamic optimization, and flow control. Meanwhile, we also elaborate on the applications of intelligent algorithms in flow modeling, optimization and control, and demonstrate the practical effects and potential values of these technologies through specific cases and analyses.

Keywords: Fluid Mechanics, Artificial Intelligence, Machine Learning, Flow Modeling, Aerodynamic Optimization, Flow Control.

Dr. Yao Zheng is a Cheung Kong chair professor with Zhejiang University, appointed by the Ministry of Education of China since 2001. He has been the founding deputy dean of School of Aeronautics and Astronautics (2007-2013), and the vice dean of Faculty of Engineering (2014-2019), all in Zhejiang University, China, and the director of Zhejiang Institute of Turbomachinery and Propulsion Systems (2019-), China.
He had been a Senior Research Scientist for NASA Glenn Research Center, Cleveland, Ohio, USA, from 1998 to 2002. Prior to moving to NASA, he had been a Senior Software Scientist with CD-adapco (currently a subsidiary of Siemens), New York from 1997 to 1998; and a PhD candidate and a Senior Research Assistant at the Department of Civil Engineering, University of Wales Swansea, UK for eight years. He left NASA Glenn Research Center for Zhejiang University in March, 2002.
His research has spanned computational mechanics and engineering, flight vehicle design, and aerospace propulsion theory and engineering. He has authored or co-authored eight books and 500 papers. He was invited to deliver plenary lectures at the WCCM/APCOM 2016 (Seoul, Korea) and the 21st IACM Computational Fluids Conference (CFC 2021, Hangzhou, China), and a semi-plenary lecture at the WCCM/APCOM 2010 (Sydney, Australia). His awards include Finalist 2 of ACM Gordon Bell Prize (2023), Best HPC Application (CCF HPC China) (2023), a First Prize of Natural Science Award of Zhejiang Province (2020), the Qian Ling-Xi Achievement Awards for Computational Mechanics (2018), a First Prize of Scientific and Technological Progress Award of Zhejiang Province (2016), ICACM Congress Award (2016), the Du Qing-Hua Award of Computational Method in Engineering (2015), and the APACM Computational Mechanics Award (2013).
He serves as the President (2022-2025) of the Asian-Pacific Association for Computational Mechanics (APACM), and the President (2016-) of International Chinese Association for Computational Mechanics (ICACM). He had been a Vice President (2005-2020) of the Chinese Association of Computational Mechanics (CACM); and Co-Chairmen of the IACM CFC 2021 (Hangzhou, China), the CCCM-ISCM 2018 (Nanjing, China), CCCM-ISCM 2016 (Hangzhou, China), and the ICOME 2015 (Hangzhou, China).

Semi-Plenary Speakers

Recent Advances in Multiphysics and Multiphase Modelling of Large Deformation and Failure in Porous Geomaterials

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ABSTRACT: Geomaterials subjected to environmental extremes, such as rainfall infiltration, internal erosion, and permafrost thaw, exhibit highly coupled thermo-hydro-mechanical (THM) behaviours and often undergo large deformation and failure. Capturing these complex processes presents fundamental challenges, not only for conventional numerical methods but also for the mathematical modelling of the underlying physics. Accurately describing multiphase interactions, phase transitions, and the coupled effects on mechanical, hydraulic, and thermal responses requires robust governing equations and advanced constitutive models, capabilities still limited in many existing frameworks. This talk presents recent advances in both mathematical modelling and computational techniques through a unified, mesh-free framework based on Smoothed Particle Hydrodynamics (SPH). This framework enables high-fidelity simulation of multiphysics-driven failures in porous geomaterials, from failure initiation to post-collapse flow. By integrating novel multiphase formulations and constitutive models, including those tailored for unsaturated soils, internal erosion, and frozen ground, the framework provides predictive capabilities for a wide range of climate-related geohazards, such as rainfall-induced landslides, embankment collapse, and thaw-triggered slope failures. Applications will demonstrate how this SPH-based approach advances our understanding of complex failure mechanisms and contributes to the development of more resilient infrastructure in the face of evolving environmental conditions.

Prof. Ha H. Bui is an ARC Future Fellow and Head of the Department of Civil and Environmental Engineering at Monash University. He is internationally recognised for pioneering computational solutions in geomechanics, particularly through the development and application of mesh-free methods such as Smoothed Particle Hydrodynamics (SPH). His seminal contributions introduced SPH to geomechanics, establishing a new research direction that has since enabled the simulation of complex failure processes previously considered intractable. Prof. Bui's research advances fundamental mathematical modelling in geomechanics, including the development of novel multiphysics governing equations and constitutive models. His work places particular emphasis on bridging scales in the simulation of localised failure in geomaterials. He is the founder of GeoXPM, an open software SPH platform built on the advanced multiphysics models developed in his research, enabling the simulation of a wide range of geohazard scenarios, from rainfall-induced landslides and internal erosion to rock fracturing and complex coupled flow-deformation processes. His work has redefined predictive modelling capabilities across civil, mining, and climate resilience applications. He is the recipient of several prestigious awards, including the 2021 ALERT Research Medal from The Alliance of Laboratories in Europe for Education, Research and Technology (ALERT Geomaterials), the ARC Future Fellowship, and a JSPS Invitational Fellowship from the Japan Society for the Promotion of Science. Prof. Bui currently serves as Editor of Computers and Geotechnics, Associate Editor of the European Journal of Environmental and Civil Engineering, and sits on the editorial boards of several leading journals in geomechanics.

Level-Set Topology Optimisation with GridapTopOpt.jl: A Memory-Distributed Julia Package with Automatic Differentiation Capabilities

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ABSTRACT Topology optimisation is a powerful computational tool for solving PDE-constrained engineering design problems for a range of applications, including those related to solid mechanics, fluid mechanics, acoustics, and more. When using a level-set approach, the material boundary is implicitly defined using a level-set function, which is evolved during the optimisation process to update the design. An appropriate boundary evolution can be determined using shape derivatives of the optimisation objective and of any constraints. Benefits of a level-set approach include a well-defined material boundary, which avoids the need for large regions of intermediate densities that can be problematic for some design problems.

In this talk, I'll present our open-source Julia package for level-set topology optimisation, GridapTopOpt.jl, and outline its features as well as recent extensions and applications. The package allows solution of large-scale topology optimisation problems by distributing computations over a high-performance computing cluster. The syntax is near one-to-one with mathematical notation, facilitating implementation of new topology optimisation problems. Furthermore, the package implements automatic differentiation, circumventing the need for analytical calculation of shape derivatives. I'll talk about our work designing periodic piezoelectric materials as well as our recent extension of GridapTopOpt.jl to unfitted finite element discretisations.

Associate Professor Vivien Challis completed her undergraduate degree at the University of Otago, New Zealand, before completing her PhD in Mathematics at The University of Queensland. She moved to Queensland University of Technology in 2019 as a Lecturer in Applied and Computational Mathematics, and has since been promoted to Associate Professor.
Associate Professor Challis's research interests lie in material modelling, structural topology optimisation, computational mechanics, level-set methods, and high-performance computing. As well as working on theoretical and computational developments, she collaborates with experimentalists. Her research contributions were recognised with the award of the 2024 JH Michell Medal from ANZIAM.

Applications of Physics-informed Neural Networks on Computational Fluid Dynamics

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ABSTRACT: Recently, machine learning has received plenty of attentions due to the fast progress of GPU computing. However, machine learning needs many data to simulate a system. For a problem lack of data, physics-informed neural networks (PINNs) was proposed by Raissi et al. [1]. PINNs leverage the principles of physics to guide the learning process of neural networks, enabling them to approximate solutions to partial differential equations that govern fluid dynamics. This method significantly reduces the reliance on extensive datasets, making it particularly advantageous in scenarios where data is scarce or difficult to obtain. By incorporating physical laws directly into the loss function, PINNs ensure that the learned solutions adhere to the governing equations, boundary conditions, and initial conditions of the fluid system under consideration. We established a PINNs model for solving incompressible fluid flow. The benchmark problem, cavity flow, was simulated using the proposed PINNs model. A special loss function in PINNs was suggested to allow an effect of utilization of noisy data. As a result, the cavity flow can be simulated using PINNs with less 100 velocity data. Also, as long as those data are allocated properly, no noise is found in solutions (see Satyadharma et al. [2]). Furthermore, PINNs can be used to estimate numerical error in CFD solutions due to different meshes. In addition, to estimate numerical error, it requires several fine mesh simulations. We also built a PINNs model which can estimate the error with a single simulation dataset. This can save more computational time to calculate numerical error in solutions. This abstract highlights the potential of PINNs to revolutionize traditional CFD methodologies, offering a promising pathway towards more efficient and reliable fluid dynamics simulations.
This work was supported by National Science and Technology Council (Grant no. NSTC 112-2221-E-011-075-MY3 and 112-2221-E-011-074-MY3) and National High Performance Computing Center Taiwan.

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Prof. Ming-Jyh Chern is a Professor and Dean of Engineering at the National Taiwan University of Science and Technology. He earned his D.Phil. in Engineering Science from the University of Oxford in 1999, following his M.S. and B.S. degrees from National Taiwan University. With extensive experience in academia, he has served as an Associate Professor and Assistant Professor at his current institution, as well as a post-doctoral fellow at the Institute of Physics, Academia Sinica. His research interests encompass computational fluid dynamics, turbulence, and biomedical fluid dynamics, among others. He has published 70 SCI journal papers in his research area. Prof. Chern is actively involved in professional organizations and has held significant editorial and leadership roles, including President of TWSIAM. He has received numerous accolades, including keynote speaker invitations at international conferences and several best paper awards. Prof. Chern is also a principal investigator for various research projects funded by the Ministry of Science and Technology in Taiwan, contributing significantly to advancements in fluid dynamics and engineering education.

Deep Material Network for Multiscale Nonlinear Problems and Virtual Product Design

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ABSTRACT: Deep Material Network (DMN) is a micromechanics-informed deep-learning architecture for multiscale materials modeling that uses a hierarchical network of mechanistic building blocks with analytical homogenization solutions to ensure physical consistency. Notably, DMN has demonstrated the ability to extrapolate from linear-elastic training data to complex nonlinear behaviors such as plasticity and damage with remarkable accuracy. Recent advances extend DMN's generality via graph neural network (GNN) integration, which extracts microstructural features to parameterize the network and thus enables accurate predictions across multiple disparate microstructures. In parallel, new foundation model approaches leverage large pre-trained DMNs to enable efficient transfer learning, dramatically reducing the domain-specific data required for high-fidelity material predictions. DMN has transitioned from academia to industry through integration into virtual product design tools (e.g., ANSYS LS-DYNA), powering real-world simulations from automotive crash analyses and electronics drop tests to giga-casting property prediction. This development exemplifies how academic–industry collaboration can accelerate progress in concurrent multiscale simulation, product design, and ICME (Integrated Computational Materials Engineering). In this semi-plenary talk, I will overview the DMN framework and its latest enhancements, highlighting their generality and impact on multiscale simulation and virtual product design.

Prof. Chuin-Shan (David) Chen is a Distinguished Professor at National Taiwan University (NTU), with joint appointments in the Department of Civil Engineering and the Department of Materials Science and Engineering. He currently serves as President of the Association of Computational Mechanics Taiwan (ACMT) and as an Executive Council Member of both the International Association for Computational Mechanics (IACM) and the Asian-Pacific Association for Computational Mechanics (APACM). Prof. Chen has been recognized with numerous honors, including the IACM Fellow Award (2012) and the APACM Computational Mechanics Award (2019). His current research focuses on integrating physics-based modeling with emerging artificial intelligence techniques to advance next-generation industrial product design, multiscale materials modeling, and manufacturing simulation.

Numerical and Theoretical Prediction of Punching Shear and Post-Punching Strengths for Preventing Progressive Collapse in Concrete Flat Plate Structures

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ABSTRACT: Progressive collapse is a structural failure that is disproportionate to the initial localised damage, typically triggered by accidental events. While concrete flat plate structures are widely used in modern construction, they are particularly susceptible to punching shear failure - a critical mechanism that can initiate progressive collapse and lead to significant social, psychological, and economic consequences. The post-damage phase is characterised by highly nonlinear behaviour, large deformations, and a dynamic, system-wide response. To better understand these failure mechanisms, we conducted experiments on a range of in-plane restrained slab-column joints and 2×2-bay substructures. Based on the experimental data, 3D nonlinear finite element models were developed and validated. The numerically predicted punching shear and post-punching strengths serve as key indicators of the structural resistance to progressive collapse. Furthermore, parametric studies were performed to support the development of theoretical prediction methods.

Keywords: Progressive Collapse; RC Flat Plate Structures; Punching Shear; Post-punching Behaviour.

Professor Hong Guan is a leading expert in structural engineering and computational mechanics, with research interests spanning finite element modelling, failure and collapse analysis of concrete and timber structures, bridge deterioration modelling, structural health monitoring, and structural optimisation. She is internationally recognised among the world's top 2% scientists (Elsevier BV) and ranks among the top 10 global researchers in the field of disproportionate/progressive collapse of concrete structures (Scopus). She has authored over 370 technical publications. She currently serves as the Sustainable Construction Theme Leader at Griffith University's Environmental Research Institute. She is also an appointed member of the ARC College of Experts and a member of the Executive Committee of the Australian Network of Structural Health Monitoring (ANSHM).

Recent Developments in Peridynamics for Computational Mechanics

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ABSTRACT: Peridynamics, a nonlocal formulation of classical continuum mechanics, has been developed as a robust methodology for simulating discontinuities such as cracks and material damages. This semi-plenary talk provides a comprehensive overview of recent advances in peridynamics, with a focus on its evolving role in computational mechanics. Cutting-edge developments in constitutive modeling, numerical stabilization techniques, and the coupling of peridynamics with traditional methods such as the finite element method will be explained and discussed. The presentation will also highlight the unique strengths of peridynamics in simulating complex, real-world problems from the viewpoints of multiscale and multiphysics simulations and illustrate the significance of peridynamics in advancing the frontiers of computational mechanics.

Dr. Jung-Wuk Hong is a Professor in the Department of Civil and Environmental Engineering at Korea Advanced Institute of Science and Technology (KAIST), where he also serves as Director of the Center for Disaster Science and Technology. Since 2024, he has been Editor-in-Chief of Advances in Engineering Software, a leading international journal in computational simulation spanning civil, mechanical, and aerospace engineering. Professor Hong earned his Ph.D. from Massachusetts Institute of Technology (MIT) in 2004. Before joining KAIST in 2012, he was a faculty member at Michigan State University, where he received the prestigious Young Investigator Program (YIP) Award from the U.S. Air Force Office of Scientific Research (AFOSR) in 2010. Professor Hong has focused on enhancing the resilience of structures under extreme events such as earthquakes, blasts, and impacts through advanced computational methodologies. His work encompasses peridynamics, coupled simulations, and multiphysics modeling. Professor Hong has published over 100 peer-reviewed journal articles and has been recognized with numerous honors, including a commendation from the Korean Ministry of Science and ICT and the KAIST Technology Innovation Award.

Floating Projection Topology Optimization of Structures and Metamaterials

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ABSTRACT: Topology optimization has become an important design tool not only for conventional engineering structures but also for cross-disciplinary acoustic and nanophotonic metamaterials. However, most topology optimization approaches fundamentally depend on the heuristic material penalization scheme or an equivalent and have a series of deficiencies for solving non-traditional compliance minimization problems. By breaking through this dependence, the floating projection topology optimization (FPTO) method generates a clear structural topology by imposing implicit 0/1 (void/solid) constraints on design variables without the need for material penalization. It facilitates many topology optimization problems using a simple linear material interpolation. This presentation will report recent developments of the FPTO method, particularly on stress minimization of large-scale continuum structures using GPU parallel computing, to demonstrate the advantages of the FPTO method. The results indicate that the stress-minimized structures could generate some new geometry features, such as strengthening ribs and full stress distribution, which have never been found in the compliance-minimized structures. Meanwhile, we will also demonstrate the versatile capabilities of the FPTO method for the inverse design of acoustic metamaterials with exotic properties, e.g., topological insulators and bound states in the continuum (BIC).

Keywords: Floating projection topology optimization (FPTO), stress minimization, acoustic metamaterials

Xiaodong Huang is a professor of engineering mechanics at the School of Engineering, Swinburne University of Technology. Before moving to Swinburne in 2017, he worked at RMIT University for 13 years. He received his PhD in Mechanical Engineering with a focus on structural crashworthiness from Swinburne in 2004.

Dr. Huang is currently a research leader in the field of topology optimization and its multidisciplinary applications. He is the primary innovator of the current bi-directional evolutionary structural optimization (BESO) algorithm and the sole innovator of the floating projection topology optimization (FPTO) algorithm. The algorithms are widely welcomed in the research community of topology optimization and applied to the optimization design of various structures and materials. He has published one monograph and 200 SCI journal articles, with over 14,000 citations.

Dr Huang was awarded with the ARC APD fellow in 2006 and the ARC Future Fellow in 2013. Dr. Huang was the conference chair of the sixth Australiasian Conference on Computational Mechanics (ACCM 2023). He is currently the College of Expert member of Australian Research Council (ARC) and Executive Committee member of the Australian Association for Computational Mechanics.

An AI-enhanced SPH Framework for Whole-Process Dynamic Simulation of Cardiovascular Diseases

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ABSTRACT: Cardiovascular diseases (CVDs) remain the leading cause of death globally, with nearly 20 million deaths annually, and represent a major health burden affecting all populations. Among them, acute events caused by vascular rupture and thrombosis are the most fatal, accounting for the majority of CVD-related mortality. Despite advances in imaging and computational CVD diagnostics, most studies remain limited to the intact vessel state and cross-sectional risk assessments, lacking longitudinal resolution and predictive capacity for rupture and thrombotic evolution. Consequently, key dynamic mechanisms such as fatigue and flow pulsatility remain insufficiently resolved. Moreover, conventional cardiovascular simulations are often computationally intensive, limiting their applicability in time-sensitive clinical decision-making. To address these challenges, we present an AI-enhanced Smoothed Particle Hydrodynamics (SPH) framework for whole-process dynamic simulation of CVDs. Firstly, we develop a robust and accurate SPH fluid-structure interaction (FSI) solver that captures nonlinear hemodynamics, large wall deformations, and rapidly evolving interfaces. Physiological fidelity is further enhanced by incorporating a novel fiber orientation method and biomechanical details. Crucially, we extend the solver with phase-field fracture and coagulation cascade models, yielding a unified fluid-structure-fracture-thrombosis coupling algorithm that, for the first time, achieves dynamic prediction from vessel failure to thrombus formation. To reduce computational cost, a 0D Windkessel model and a 2D solid-shell SPH formulation are tightly coupled with the 3D solver. Additionally, leveraging the SPH simulation datasets, a highly efficient surrogate model based on Fast Function Extraction is constructed for fast or nearly real-time predictions. The framework has been rigorously validated and successfully applied to patient-specific cases of aortic dissection, cerebral aneurysm, and acute coronary syndrome, achieving clinically consistent predictions while reducing time cost from several days to seconds. It represents the first approach capable of dynamically predicting the full progression of CVDs, offering a powerful tool for longitudinal study, precision prevention, and decision support.

Moubin Liu is a Tenured Full Professor, the Vice Dean of the School of Mechanics and Engineering Science, and the Director of the Center of Industrial Software Research, Peking University. His research interests including computational mechanics, fluid-structure interaction, multiphysics modeling and AI-enhanced engineering intelligence. He authored two popular monographs, including the first-ever book on the Smoothed Particle Hydrodynamics. He published over 180 SCI indexed papers with 10 ESI highly cited papers, and more than 16800 Google citations. He has received a number of awards from universities and scientific organizations worldwide including the International Computational Award (2019), ICACM Computational Mechanics Award (2018), First Prize in Natural Sciences from the Ministry of Education (2017), the 100 Talent Program Award from CAS (2009), and the prestigious Lee Kuan Yew Fellowship Award (2005). He is the associate editor of EABE and IJCM and the editorial Board Member of four other international journals, and has been consecutively listed by Elsevier as a “Most Cited Chinese Researcher” in Computational Mechanics from 2015 and the World's Top 2% Scientists (both career and single year) by Stanford.

Recent Advances in Studying Fracture Mechanisms and Fracture Toughness of Double-Network Hydrogels

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ABSTRACT: Double-network (DN) hydrogels are renowned for their exceptional fracture toughness, attributed to their unique interpenetrating network structures. However, fully understanding the mechanisms underlying their fracture behavior and toughening processes necessitates advanced computational, theoretical and experimental approaches. This work integrates computational modeling, network mechanics, and experimental validation to elucidate the interplay between microstructure, energy dissipation, and fracture behavior in DN hydrogels. A mesoscopic network mechanics model is developed, incorporating stretch-based criteria to govern polymer chain fracture. This enables the prediction of ductile-to-brittle transitions in the DN hydrogels. Numerical simulations reveal that stretch ratios induce necking and hardening effects, while uniform stress distribution within the first network enhances toughness. Theoretical analysis of fracture toughness is performed using uniaxial tensile and tearing tests, partitioning apparent toughness into intrinsic and dissipative components. An exponential function is introduced to correlate fracture energy with specimen free width, addressing inconsistencies in crack-tip field characterization. Multi-scale modeling bridges molecular dynamics and finite element methods to simulate hyperelasticity, large deformations of DN hydrogels, with results validated against experimental swelling and phase transition behaviors. This study establishes a unified computational-theoretical-experimental framework, linking microstructural interactions-such as network stretch criteria and cross-linking density-to macroscopic toughness properties. The findings contribute to the development of predictive models for DN hydrogel design, offering valuable insights for applications in soft smart fatigue-resistant materials. This work also lays the foundation for next-generation hydrogels with tailored fracture resistance.

Dr. Zishun Liu is a Chair Professor and Vice-President (Research & Innovation) at City University of Hong Kong (Dongguan) and visiting Chair Professor at Xi'an Jiaotong University (XJTU). Dr. Liu received B.Eng., M.Eng., PhD degrees in Applied Mechanics from XJTU and the National University of Singapore (NUS) respectively. He is also the General Secretary of Int. Association of Applied Mechanics (IAAM) and the Honorary President of Singapore Association of Computational Mechanics. He is IAAM fellow and SACM fellow. His research interests are in the areas of Mechanics of Soft Materials, Computational Solid Mechanics & Biomechanics, Nanomechanics, Vibro-Acoustic. He has published more than 230 SCI research papers. Dr Liu is an active member of various leadership roles in editorial boards and professional communities as follow: Dr. Liu is an Editor-In-Chief of *Int. Journal of Applied Mechanics* and *Int. Journal of Computational Materials Science and Engineering*, and Editor of *Journal of Mechanics of Material and Structures*, Associate Editor of *Journal of Applied and Computational Mechanics*. He also serves on the editorial boards of *Int. Journal of Computational Methods*, *Int. Journal of Structural Stability and Dynamics*, *Acta Mechanica Sinica*, *Acta Mechanica Solida Sinica*. Dr Liu is a General Member of the International Association for Computational Mechanics (IACM). As a Chairman, Dr. Liu has organized more than 20 Int. Conferences in the field of applied & computational mechanics.

Assessing the Strength of Tailings with High Degrees of Saturation Using Cavity Expansion Theory and Cone Penetration Testing

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ABSTRACT: Tailings, being mixtures of water and soil-sized particles, and sometimes air, are waste products generated by mining. They are stored on sites, contained by embankments, forming what are known as tailings storage facilities (TSFs). TSFs fail too often, resulting in tailings reducing in strength and, in some cases, turning to a fluid-like material (a phenomenon called 'liquefaction') that can spread many kilometres, destroying lives, property and the environment.
The strength of tailings inside a TSF may be assessed using results of cone penetration tests (CPTs), integrated with cavity expansion theory. The coexistence of air and water in the pore space means the tailings is unsaturated and gives rise to a suction. The suction, and the extent to which air and/or water can drain through the pores, affects a cavity expansion and a CPT result.
Here an adaptation of a bounding surface plasticity constitutive model is used to describe the behaviour of the tailings. A constant mass condition, relevant to undrained closed-system loading which prevails during fast deformation, Boyle's law and hydraulic hysteresis are accounted for to capture the changes to pore air and water pressures, and suction, with the change in tailings volume. The cavity expansion problem is solved using this model, considering four possible drainage conditions (constant suction, constant water mass, constant contribution of suction to the effective stress, and a constant air and water mass). It is reasoned that solutions for a closed system are relevant to the interpretations of CPTs when < 15 % of the tailings volume is occupied by air, and that the constant effective stress condition (which is a close approximation to a constant water mass condition) is relevant when larger air volumes are present.
By considering CPT data it is observed that linear proportionalities exist between effective cone penetration resistances and cavity wall pressures. The cavity expansion results may then be converted to equivalent CPT results and used to construct charts which relate the normalised cone penetration resistance to the initial state parameter. The charts have use for unsaturated conditions and a variety of air volume fractions, as well as saturated conditions when the cone penetration rate is slow enough so drained conditions prevail or fast enough so that undrained conditions prevail.

Adrian R. Russell is a Professor of Geotechnical Engineering at UNSW Sydney. His expertise is in the development of analytical and semi-analytical techniques in geomechanics, the behaviour of soils and tailings and rock, physical model testing, cavity expansion theory, the CPT and knowledge transfer to industry. Professor Russell is an Australian representative on TC106 and TC221, which are International Technical Committees on unsaturated soil mechanics and tailings within the ISSMGE. He does expert review work on the stability of tailings storages and serves on Independent Tailings Review Boards. He is one of a team of industry leaders updating the AGS guidelines for risk assessments of slopes. He is also on Editorial Boards of *Geotechnique*, *Computers and Geotechnics* and the *International Journal of Rock Mechanics and Mining Sciences*. He was awarded his PhD in 2005 and BE in 1998, each by UNSW Sydney. His first academic appointment was a lectureship at the University of Bristol in the UK (2003-2007). This was followed by a move UNSW Sydney where has been ever since.

Dislocation Mechanism of Size Effects in Alloys

Akiyuki Takahashi
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ABSTRACT: As the material size decreases to the micro- or nano-scale, traditional bulk material behavior no longer applies and different deformation mechanisms become dominant. The phenomenon is commonly called size effects. In recent years, experimental studies on the size effects in alloys have been extensively conducted. To investigate the dislocation mechanism underlying the size effects in alloys, we are developing a computational method to model the interaction between dislocations and multiple precipitates with arbitrary shapes and distributions. By integrating this dislocation-precipitate interaction method with the superposition principle, which accounts for free surface effects in dislocation simulations, we enable the simulation of size effects in alloys. In this lecture, we will discuss the computational method and the dislocation mechanism underlying the size effects, particularly in alloys.

Name: Akiyuki Takahashi
Affiliation: Department of Mechanical and Aerospace Engineering, Tokyo University of Science
Position: Professor Academic degree: Dr. (Eng) (From University of Tokyo, 2003)
Research Interest: Computational materials science, Dislocation dynamics simulations, Meso-scale mechanism of plasticity, Physics of defects.

Exploring Flow Dynamics: Challenges and Breakthroughs in Aerospace Fluid Engineering

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ABSTRACT: Flow is a fundamental engineering challenge affecting high-speed vehicles and jet engines performance. While the governing equations of flow help us understand various transport systems, capturing the complexities of turbulence and transitions remains difficult. Our research aims to refine this understanding by elucidating the such transition mechanisms of flow that impact performance. We explore the role of vortices near fluid machinery surfaces and are trying to control it in a practical way. Generally we employ turbulence models in aircraft development. By integrating statistical and theoretical models through data assimilation, we enhance flow predictions and reduce computational costs, making it beneficial for real-world applications. Additionally, we utilize magnetic suspension balance systems for accurate aerodynamic drag measurements without mechanical interference, and we are developing systems for high-speed flight and drag reduction device validation.

Prof. Aiko Yakeno is an Associate Professor at the Institute of Fluid Science, Tohoku University. After graduating from Osaka University, she entered the Graduate School of the University of Tokyo, and later studied at Imperial College London in the UK before obtaining her Ph.D. in Engineering from the University of Tokyo. Having served as a researcher at the Japan Aerospace Exploration Agency (JAXA) and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), she has been conducting research related to aerospace fluid dynamics at Tohoku University since 2017. A rising star in her field, Prof. Yakeno has received several prestigious awards, including the Ryumon Prize from the Japan Society of Fluid Mechanics, the Frontier Award from the Japan Society of Mechanical Engineers, and the Young Scientist Award from the Minister of Education, Culture, Sports, Science and Technology. Starting in 2024, she leads a large-scale research project aiming to bridge mathematics and engineering. Prof. Yakeno offers fresh perspectives on the role and challenges of fluid research in aerospace industry and is deeply interested in practical applications, not only through the conventional theory but also through more practical approaches.

Recent Advances in Vehicle Scanning Method for Bridges

Yeong-Bin Yang
Chongqing University
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ABSTRACT: This presentation highlights key contributions made by the speaker and colleagues since the 1990s. The work began with the AASHTO (1992) impact formula, which lacked physical clarity. To address this, the team introduced vehicle–bridge interaction (VBI) analysis—used for the first time—and derived VBI elements that enabled a new set of physically meaningful impact formulas for bridges. They then proposed an optimal design rule for simple beams in high-speed railways: beam vibration is minimized when the beam length is 1.5 times the vehicle length. This guideline has been widely adopted in Europe, China, Japan, and Korea. Inspired by VBI research, the team introduced the concept of using a moving test vehicle to scan bridge frequencies. This indirect approach, later termed the vehicle scanning method (VSM), was validated in field tests and expanded to detect mode shapes and other dynamic properties using vehicle–bridge contact responses. Recent advances apply VSM with a two-axle test vehicle, enabling: (1) Separation of flexural and torsional frequencies from left and right wheel responses. (2) Identification of damping using wheel measurements at different times. (3) Construction of mode shapes using front and rear wheel data collected simultaneously. The VSM has been successfully demonstrated on bridges in Taipei, Chongqing, and Xiamen.

References

1.Yang, Y. B., Yang, J. P., Zhang, B., and Wu, Y.T., Vehicle Scanning Method for Bridges, John Wiley and Sons, Ltd., London, 2019.
2.Xu, H., Yang, D.S., Yang, Y.B., Advanced Vehicle Scanning Method: Bridge Modal Parameter Identification, John Wiley and Sons, Ltd., London 2025.

Dr. Yeong-Bin Yang got his Ph.D. degree from Cornell University in 1984. He is a member of Chinese Academy of Engineering and European Academy of Sciences and Arts, foreign member of Austrian Academy of Sciences. Currently, he is Honorary Dean of School of Civil Engineering, Chongqing University, China and Professor Emeritus of National Taiwan University (NTU), and Editor-in-Chief of International Journal of Structural Stability and Dynamics (IJSSD). Previously, he was President of National Yunlin University of Science and Technology (YunTech), Dean of College of Engineering, Chairman of Civil Engineering Department, NTU, President of Asian-Pacific Association of Computational Mechanics (APACM), and Chairman of East Asia-Pacific Conference on Structural Engineering and Construction (EASEC). He received a number of Awards, including Lifetime Achievement Medal, ASCE Greater China Section (2023); Zienkiewicz Medal, APACM (2022); Li-Guo-Hao Bridge Innovation Medal, Tongji University, China (2022); Nishino Medal, EASEC (2016); Tsuboi Award, IASS (2008); Munro Prize, Engineering Structures (2003); Outstanding Scientist, Nobel Laureate Dr. Y. T. Lee's Foundation, Taiwan (1998); Distinguished Research Award, National Science Council, Taiwan (1988-1998); etc. In addition, he has published 6 books and more than 330 SCI papers, with a Google citation of 20,621 times and h-index of 72.

Multiscale, Multiphysics Modelling of Granular Media: Bridging Continuum and Discrete Realms

Jidong Zhao
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ABSTRACT: Granular media are ubiquitous in civil, mining, chemical, and energy systems. They defy conventional material classifications, exhibiting solid-like rigidity, fluid-like flow, and dynamic phase transitions. These complex behaviors, governed by multiscale interactions and multiphysics coupling (e.g., thermal-hydraulic-mechanical, THM), challenge traditional computational paradigms. This talk presents a transformative *continuum-discrete coupling framework* that synergizes the strengths of continuum methods (FEM, MPM, SPH) with physics-centric discrete approaches (DEM, contact dynamics, physics engines). It features a robust hierarchical coupling strategy enabling unprecedented insights into granular phenomena such as strain localization, liquefaction, and catastrophic failure, while addressing critical engineering challenges such landslides, permafrost-infrastructure collapse, carbon sequestration, and methane hydrate extraction. Through case studies, we demonstrate how this unified framework captures large deformations, multiphysics interactions, and emergent behaviors across scales. We further discuss how AI-augmented modeling may further empower the design and analysis in geomechanics and sustainable engineering.

Dr. Jidong Zhao is a Professor of Civil and Environmental Engineering at The Hong Kong University of Science and Technology (HKUST) and a Chang Jiang Scholar Chair Professor of China's Ministry of Education. He holds a bachelor's degree and Ph.D. in Civil Engineering from Tsinghua University. Dr. Zhao's research bridges granular physics, advanced numerical methods, and geohazard mitigation. His work on multiscale, multiphysics modeling of granular systems has redefined predictive capabilities for industrial and environmental applications, from energy infrastructure resilience to climate-critical processes like carbon storage. Recognized globally, Dr. Zhao is a two-time recipient of the Scott Sloan Best Paper Award (2018, 2021), delivered the 2022 GeoCongress State of the Art (SOA) Lecture, and was honoured with the 2023 Invitational Fellowship from the Japan Society for the Promotion of Science (JSPS). He leads the computational geomechanics community as Co-Editor-in-Chief of Computers and Geotechnics, Section Editor for Granular Matter, and Associate Editor for the ASCE Journal of Engineering Mechanics.

AI Empowers Academic Modeling and Engineering Design

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ABSTRACT: In the era of artificial intelligence (AI), by integrating application scenarios and leveraging the big data generation, editing and clustering functions of AI technology, through the fusion of generative models and mechanical mechanisms, CAD models of structural geometric features and topological optimization are established to generate parametric constitutive or model-free constitutive of materials, achieving breakthroughs in intelligent design and developing efficient computing and analysis software empowered by AI for CAE. Taking the precise reconstruction of prosthesis bone for personalized bone defects and clinical practice, as well as the co-evolutionary design of the proxy model of composite material structure for large aircraft wings as examples, the effect of AI-empowered mechanical modeling and engineering design is proved.

Professor of the School of Aerospace Engineering, Tsinghua University, Academician of the European Academy of Sciences and Arts (EASA), Vice President of the International Association for Computational Mechanics (IACM), and specially invited expert of the China Committee of the International Council for Science (ISC-China). Doctor of University College Dublin, Ireland 1995, and Honorary Doctor of Swansea University, UK, 2017. Chief Scientist of the National 973 Project. Published more than 380 academic papers,and more than 10 academic books, which are cited by 15,000 times. More than 25 invention patents and 8 software Copyrights are obtained.

Detailed Program

Plenary Talks

Day 1: December 08, 2025, Monday

Room: PTR

Chair: Hiroshi Okada

Time	Title
08:50 – 09:40	Law-based and data-based methods: stability issues revisited with PINNs, **Gui-Rong Liu**
09:40 – 10:30	Conquering Generalization Challenges in AI – enhanced Computational Mechanics: Thoughts and Practices, **Xu Guo**

Day 2: December 09, 2025, Tuesday

Room: PTR

Chair: Gui-Rong Liu

Time	Title
08:00 – 08:50	On spectral element methods for the analysis of acoustic and mechanical metamaterials, **Chuanzeng Zhang**
08:50 – 09:40	Two-scale analysis of composite materials using surrogate computational homogenization, **Kenjiro Terada**
09:40 – 10:30	Fluid Mechanics and Artificial Intelligence, **Yao Zheng**

Day 3: December 10, 2025, Wednesday

Room: PTR

Chair: Nasser Khalili

Time	Title
08:00 – 08:50	Machine Learning based solutions of PDE with applications in engineering and mechanics, **Timon Rabczuk**
08:50 – 09:40	Structural behaviour of composite structures under projectile and laser impact, **Yixia (Sarah) Zhang**
09:40 – 10:30	Multiscale Mechanics of Cells and Biological Tissues, **Xi-Qiao Feng**
13:30 – 14:20	Advanced Design and Manufacturing of Stent-grafts for the Treatment of Aortic Diseases, **Fangsen Cui**

Semi-Plenary Talks

Day 1: December 08, 2025, Monday

Room: PTR

Chair: Qing Li

Time	Title
13:30 – 14:10	Recent Advances in Vehicle Scanning Method for Bridges, **Yeong-Bin Yang**
14:10 – 14:50	Recent Advances in Studying Fracture Mechanisms and Fracture Toughness of Double-Network Hydrogels, **Zishun Liu**

Room: P1

Chair: Tracy Ruan

Time	Title
13:30 – 14:10	Level-set topology optimisation with GridapTopOpt.jl: a memory-distributed Julia package with automatic differentiation capabilities, **Vivien Challis**
14:10 – 14:50	Floating Projection Topology Optimization of Structures and Metamaterials, **Xiaodong Huang**

Room: P2

Chair: Fangsen Cui

Time	Title
13:30 – 14:10	AI empowers academic modeling and engineering design, **Zhuo Zhuang**
14:10 – 14:50	Deep material network for multiscale nonlinear problems and virtual product design, **Chuin-Shan (David) Chen**

Day 2: December 09, 2025, Tuesday

Room: PTR

Chair: Emilie Sauret

Time	Title
13:30 – 14:10	Multiscale, Multiphysics Modelling of Granular Media: Bridging Continuum and Discrete Realms, **Jidong Zhao**
14:10 – 14:50	Applications of Physics-informed Neural Networks on Computational Fluid Dynamics, **Ming-Jyh Chern**

Room: P1

Chair: Yixia (Sarah) Zhang

Time	Title
13:30 – 14:10	Recent Developments in Peridynamics for Computational Mechanics, **Jung-Wuk Hong**
14:10 – 14:50	Dislocation mechanism of size effects in alloys, **Akiyuki Takahashi**

Room: P2

Chair: Moubin Liu

Time	Title
13:30 – 14:10	Exploring Flow Dynamics: Challenges and Breakthroughs in Aerospace Fluid Engineering, **Aiko Yakeno**
14:10 – 14:50	Assessing the strength of tailings with high degrees of saturation using cavity expansion theory and cone penetration testing, **Adrian Russell**

Day 3: December 10, 2025, Wednesday

Room: PTR

Chair: Vivien Challis

Time	Title
14:20 – 15:00	Numerical and theoretical prediction of punching shear and post-punching strengths for preventing progressive collapse in concrete flat plate structures, **Hong Guan**

Room: P1

Chair: Chuin-Shan (David) Chen

Time	Title
14:20 – 15:00	Recent Advances in Multiphysics and Multiphase Modelling of Large Deformation and Failure in Porous Geomaterials, **Ha Bui**

Room: P2

Chair: Yinghui Tian

Time	Title
14:20 – 15:00	An AI-enhanced SPH Framework for Whole-Process Dynamic Simulation of Cardiovascular Diseases, **Moubin Liu**

Parallel session

Day 1: December 08, 2025, Monday

Session A1-1 (Room PTR): Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics (MS19)

Chair: Naoto Mitsume

Time	Title/Authors
10:50 – 11:10	**Invited:** Multiscale modelling of recycled PET and PETG using fused granulate fabrication, **Phan Quoc Khang Nguyen***
11:10 – 11:30	**Invited:** Eulerian Elastoplastic Simulation of Structures with Micro-Voids, **Yuuri Ozaki***
11:30 – 11:45	A Graph-Based Generalization of Geometric Domain Decomposition Based Parallelization for Advanced Galerkin Methods, **Naoto Mitsume**
11:45 – 12:00	Design and numerical assessment of shock absorbing flooring for the elderly using mechanical metamaterials, **Matsumoto Taiga***
12:00 – 12:15	Nonlinear Buckling Analysis of Functionally Graded Shells Based on Isogeometric Reissner-Mindlin Theory, **Haoyu Wu***
12:15 – 12:30	Comparative study of locking-free finite elements on bending dominated and incompressible deformation, **Kaoru Horita***

Session A1-2 (Room PTR): Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics (MS19)

Chair: Koji Nishiguchi

Time	Title/Authors
15:10 – 15:30	**Invited:** A semi-concurrent multiscale algorithm for fluid-structure-crack interaction of a large-scale wind turbine blade subjected to strong winds, **Gong Chen***
15:30 – 15:50	**Invited:** A multi-GPU computational framework for large-scale phase field crack simulations, **Hanming Yang***
15:50– 16:05	Large-Scale Parallel Flow Analysis with Implicit Field-Based Neural Surface Reconstructions, **Takumi Nemoto***
16:05 – 16:20	Hierarchical Subdomain Preconditioning Utilizing Eigenmodes in Parallel Finite Element Analysis, **Naoki Morita**
16:20 – 16:35	Multi-scale analysis to predict macroscopic material response associated with uncertainties of microstructure, **Takuma Hori***
16:35 – 16:50	Linear and nonlinear anisotropic enhancements of fiber-reinforced hyperelastic materials, **Hio Konishi***

Session A1-3 (Room PTR): Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics (MS19)

Chair: Naoto Mitsume

Time	Title/Authors
17:00 – 17:20	**Invited:** A CFD-DEM based wear prediction analysis for coating damage considering fluid-particle interactions, **Zihao Li***
17:20 – 17:40	**Invited:** Hierarchical domain decomposition parallelization for local POD with adaptive basis selection, **Kyohei Shintate***
17:40 – 17:55	Measurement of deformation behavior of aluminum alloy under biaxial tensile test and estimation of material model parameter using data assimilation, **Shun Shimaoka***
17:55 – 18:10	Parameter estimation of material models for data assimilation using uniaxial tensile test under high-temperature condition, **Masaki Isegawa***
18:10 – 18:25	2D incompressible viscous flow analysis based on NURBS-Enhanced FEM (NEFEM), **Tomohiro Miyake***
18:25 – 18:40	Active Regions of Transonic Buffet by Fluid-Structure Interactions, **Guannan Zheng***

Session B1-1 (Room P1): Computational fluid dynamics simulation: flow prediction and application (MS30)

Chair: Hiroya Mamori

Time	Title/Authors
10:50 – 11:05	Development of Coupling Scheme of Grid- and Particle-Based Methods for Numerical Prediction of Supercooled Large Droplet Icing on NACA0012 Airfoil Using Parcel Assumption, **Koji Fukudome**
11:05 – 11:20	Optimal Design of Bionic Centrifugal Fans in Use of Taguchi Method and Analysis of Variance, **Meijiau Huang**
11:20 – 11:35	Deep Learning-Based Surrogate Model of Constitutive Equation in Viscoelastic Turbulence for Avoiding Numerical Instabilities, **Eitetsu Nakashima***
11:35 – 11:50	Direct numerical simulation of turbulent thermal channel flow over riblet surface, **Yutaro Koide***
11:50 – 12:05	Turbulent heat transfer enhancement by large-scale perturbation associated with the Kelvin-Helmholtz instability, **Yusuke Kuwata**
12:05 – 12:20	Data-driven algebraic model for turbulent heat transfer over several types of rough surfaces, **Kuga Terada***

Session B1-2 (Room P1): Computational fluid dynamics simulation: flow prediction and application (MS30)

Chair: Yusuke Kuwata

Time	Title/Authors
15:10 – 15:25	Determining the Representative Elementary Area for Multiphase Flow in Gas Diffusion Layers: Leveraging Tomographic Imaging with the Lattice Boltzmann Method, **Nicholas Paraskevas***
15:25 – 15:40	Numerical Investigation of Influence of Airfoil Shape on Sand Erosion in a Low-Pressure Turbine, **Mizuki Watanabe***
15:40– 15:55	Thermal Control and Amplification of Viscoelastic Secondary Flows in Microfluidic Devices, **Guillaume Maitrejean**
15:55 – 16:10	Tilting of vortex rings in the oblique collision reduces the aerodynamic sound, **Zang Zhenyu***
16:10 – 16:25	Flow field prediction for high-speed trains using vortex generators based on deep learning, **Zian Yang***
16:25 – 16:40	Effect of Cross-Sectional Shape of 3-Dimensional Riblets upon Drag Reduction and Surface Stress in Turbulent Channel Flow, **Taiki Watanabe***

Session B1-3 (Room P1): Computational fluid dynamics simulation: flow prediction and application (MS30)

Chair: Koji Fukudome

Time	Title/Authors
17:00 – 17:20	**Invited:** Dissimilar control by streamwise traveling waves with long wavelength in turbulent plane Couette flows, **Yusuke Nabae**
17:20 – 17:35	Validation of Two-Phase Lattice Boltzmann Simulation for Gas Entrainment Using a Quasi-Steady Vortex Flow Under Varying Inlet and Outlet Conditions, **Yos Sitompul**
17:35 – 17:50	Clinical and Computational Study of the Impact of Pressure Wire on Blood Flow and Pressure-Derived Indices, **Zhengzheng Yan**
17:50 – 18:05	A cohesion-enhanced granular kinetic multiphase CFD model for cemented paste backfill flow, **Xiangyu Xie**
18:05 – 18:20	Heat Transfer and Fluid Flow Characteristics of Turbulent Spots in Plane Couette Flow Under Temperature Stratification, **Daiki Nozawa***
18:20 – 18:35	Heat Transfer Enhancement by Traveling Wave Control in Turbulent Channel Flow, **Takeshi Mochizuki***

Day 1: December 08, 2025, Monday

Session C1-1 (Room P2): Deep and machine learning methodology applied to computational mechanics (MS07 & MS09)

Chair: Yoshitaka Wada

Time	Title/Authors
10:50 – 11:05	A hybrid CFD and machine learning approach for modeling aerosol dispersion in indoor environments, **Jiyu Yao***
11:05 – 11:20	Image-based identification of finite element input parameters to simulate progressive damage in composite materials: transfer learning and interpretability, **Johannes Reiner**
11:20 – 11:35	Three-Dimensional Crack Propagation Prediction Using Transfer Learning, **Ryosuke Akimoto***
11:35 – 11:50	Development of a surrogate model for predicting deformation of offshore wind turbine blades, **Taiki Endo***
11:50 – 12:05	MLP-Based inverse analysis in high-voltage electric shock simulations, **Sihan Liu***
12:05 – 12:20	AI reinforcement on untrained compound damage detection and scour detection in offshore wind turbine, **Weiqiang Feng**

Session C1-2 (Room P2): Deep and machine learning methodology applied to computational mechanics (MS07 & MS01)

Chair: Yoshitaka Wada

Time	Title/Authors
15:10 – 15:30	**Invited:** Prediction of Microscopic Stress in Composite Materials Using Graph Neural Networks, **Yuki Arai**
15:30 – 15:45	Micro-CT bone analysis via deep learning: A case study on the effects of risedronate and mechanical loading on aged mice, **Amine Lagouli***
15:45 – 16:00	Effect of Image Resolution on the Accuracy of AI Pose Estimation in Sprinting, **Hongjie Zheng**
16:00 – 16:15	Predicting Air Pollutant Concentration Using Deep Neural Network: Path towards a Physics-Informed Machine Learning Framework, **Paspale (Kalani) Ranathunga***
16:15 – 16:30	DBF-Net: A Generalized DL Framework for Predicting Dynamic Boundary Flow Fields in Aero-Structure Interaction, **Zhou Hongjie***.
16:30 – 16:45	Low-dissipation Schemes for Compressible Flows Using Machine Learning Based on Boundary Variation Diminishing Principle, **Hiro Wakimura**

Session C1-3 (Room P2): Modern Computational Techniques in Wind Engineering (MS33)

Chair: Yuan-Lung Lo & Matthew S. Mason

Time	Title/Authors
17:00 – 17:20	**Invited:** Assessment of LES Accuracy for Indoor Airflow Prediction: A Comparison with PIV Measurements in a Partitioned Ventilation Setup, **Yu-Ting Wu***
17:20 – 17:40	**Invited:** Large-eddy simulation of wind interaction with direct air capture systems in the atmospheric boundary layer, **Esmaeel Eftekharian**
17:40 – 17:55	Numerical Study on Aerodynamic Characteristics of a Square Cylinder under Unsteady Accelerating Flows, **Cheng-Yang Chung**
17:55 – 18:10	CFD Analysis of Building-Integrated PV Canopies for Enhancing Rooftop Wind Energy Utilization, **Yu-Hsuan Juan**
18:10 – 18:25	Study on Wind Characteristics of Balcony Glass Handrails on Buildings, **Chung-Lin Fu**
18:25 – 18:40	A Simplified Model Established by Morphometric Parameters for Urban Ventilation Potential, **Yi-Chao Li**

Session D1-1 (Room P3): Recent computational mechanics for digital twins: AI and computational methods (MS08)

Chair: Haeseong Cho

Time	Title/Authors
10:50 – 11:10	**Invited:** Physics-guided surrogate model using deterministic latent mapping for composite microstructures, **Haeseong Cho**
11:10 – 11:25	City scale simulation-driven seismic risk assessment with dynamic fragility analysis, **Dongyang Tang**
11:25 – 11:40	CDE based economic feasibility process for suitable site selection on wave energy converters, **Su-gil Cho***
11:40 – 11:55	A Study on Predicting the Behavior of Partitioned Structures using the Deep Neural Network, **Younggeun Park***
11:55 – 12:10	Data-driven Surrogate Modelling using Attention-based Deep Operator Network for Active Noise Control, **Nghia Nguyen***
12:10 – 12:25	Efficient multi-body transient simulation via the displacement-based partitioned equation, **Minho Hwang***

Session D1-2 (Room P3): Digital Twin and Artificial Intelligence for Prognostics and Health Management (MS09)

Chair: Heung Soo Kim

Time	Title/Authors
15:10 – 15:30	**Invited:** Recent Progress on AI-based Damage Assessment of Composite Laminates, **Heung Soo Kim**
15:30 – 15:50	**Invited:** Design Optimization of Cylindrical Battery Thermal Management System for Uniform Temperature, **Chang-Wna Kim**
15:50– 16:05	Mechanical Resilience and Rapid-Charging Capability of High Nickel Cathodes Through Nanoscale Framework Engineering, **Janghyuk Moon**
16:05 – 16:20	Synthetic Data-Driven Fault Diagnosis Approach to Overcome Data Scarcity in the Design Phase of Engineered Systems, **Hyunseok Oh***
16:20 – 16:35	Development of degree of freedom-based reduction for broadband frequency response analysis in local damped systems, **Geomji Choi**
16:35 – 16:50	Probabilistic Digital Twin for Misspecified Structural Dynamical Systems via Latent Force Modeling and Bayesian Neural Networks, **Sahil Kashyap***

Session D1-3 (Room P3): Computational Nanomechanics and Nanoscale Thermal Transport (MS49 & MS21)

Chair: Haifei Zhan & Yihan Nie

Time	Title/Authors
17:00 – 17:20	**Invited:** Interfacial Dislocation Networks in Nickel-based Superalloys via Atomistic Simulations, **Haifei Zhan**
17:20 – 17:35	Extreme-Scale Simulation of Thermal Transport in Silicon Nanostructures and Devices, **Chaofeng Hou**
17:35 – 17:50	The origin of Na-montmorillonite anisotropy: exploring the microstructure based on molecular dynamics under different hydration degrees, **Bonan Li**
17:50 – 18:05	Interfacial Thermal Transport in PEEK/Graphene Nanocomposites: Unravelling the Impact of Polymer Crystallinity and Graphene Functionalization, **Yihan Nie**
18:05 – 18:20	Machine-learning enabled atomic insights into the phase diagram of Lead zirconate titanate, **Xiaohan Huang***
18:20 – 18:35	Investigation on Heat Transfer Performance of Graphene Origami/Polymer Nanocomposites Using Molecular Dynamics, **Huanzhi Song***

Day 1: December 08, 2025, Monday

Session E1-1 (Room P4): CFD and Fluid-structure Interaction (FSI): Methods and Applications (MS29)

Chair: Tsung-Hui Huang

Time	Title/Authors
10:50 – 11:10	**Invited**: Fluid-structure interactions: multiple filaments, inflating balloon, badminton shuttlecock, **Sanjay Mittal**
11:10 – 11:25	A mixed diffusive-sharp interface approach for multi-physics modeling and its application to metal additive manufacturing, **Jinhui Yan**
11:25 – 11:40	A ghost element coupler for fluid-structure interaction, **Guoming Ling**
11:40 – 11:55	Numerical Investigation of Phase Separation Effects on Hydrodynamically Stable Flow in a Partially Miscible System, **Priya Verma***
11:55 – 12:10	Stabilized Reproducing Kernel Enhanced Material Point Method for Air Flow and Air-Structure Interaction with Shocks, **Tsung-Hui Huang***
12:10 – 12:25	Utilizing an Explicit Projection Method Combined with the Immersed Boundary Method for Moving Boundary Problems on Multi-GPU Clusters, **Jun-Yang Ji***

Session E1-2 (Room P4): CFD and Fluid-structure Interaction (FSI): Methods and Applications (MS29)

Chair: Jinhui Yan

Time	Title/Authors
15:10 – 15:30	**Invited**: Numerical Simulation of Fluid-Structure Interaction in Blood-Vascular Systems Based on the Material Point Method, **Lei Wang***
15:30 – 15:45	A Sharp Interface Level Set Approach without Reinitialization for High Reynolds Number Free Surface Flows, **Adam Lawrence***
15:45– 16:00	Effect of vortex-induced rotation on the aerodynamic coefficients of a rigid rectangular cylinder, **Chanaru Pramud Lakshan Aranwela Gamage***
16:00 – 16:15	Numerical Modelling of Ornamental Vegetation and Safe Distances from Buildings in Bushfire-Prone Areas, **Ifthaz Hameed Savul Hameed***
16:15 – 16:30	The quantification of domain effect in external flow simulations using physics informed neural network, **Adhika Satyadharma***
16:30 – 16:45	A numerical simulation of ferrofluid droplet emulsion in shear flow under magnetic field, **Yuto Kawabata***

Session E1-3 (Room P4): CFD and Fluid-structure Interaction (FSI): Methods and Applications (MS28 & MS29)

Chair: Fangbao Tian

Time	Title/Authors
17:00 – 17:20	**Invited:** Numerical study of powder agglomeration and intra-biomass temperature gradient effects in cement calciner, **Qiang Zheng***
17:20 – 17:40	**Invited:** Multiphysics modeling of multiphase reacting flows, **Shibo Kuang**
17:40 – 17:55	Numerical simulations of flow past elliptical cylinders, **Ramesh Nepali***
17:55 – 18:10	Performance Prediction of Cooling Impeller via Machine Learning, **Kao Tzu-Huan***
18:10 – 18:25	Adaptive isogeometric boundary element method for the fluid–structure interaction analysis of the hyperelastic thin sheet, **Togo Hayashi***
18:25 – 18:40	Numerical Study of the Periodic Deformation Behaviour of a Single RBC, **MingYu Liu***

Session F1-1 (Room P5): Mesh-free and Mesh-less method (MS13)

Chair: Takuya Matsunaga

Time	Title/Authors
10:50 – 11:10	**Invited:** Tensor-represented Model for the MPH method and its Extensions, **Kazuya Shibata**
11:10 – 11:30	**Invited:** A Hybrid resolved-unresolved SPH(2)-DEM coupling scheme for fluid-graded granular materials interactions, **Kumpei Tsuji**
11:30 – 11:45	Background Grid-Based Coarsening Technique for Computational Acceleration of the Stabilized LSMPS Method, **Daiki Hina***
11:45 – 12:00	Vertical coordinate transformations for SPH to improve computational efficiency, **Shujiro Fujioka***
12:00 – 12:15	Stabilized velocity-pressure monolithic SPH for incompressible fluid using Variational Multiscale Method, **Shodai Okano***
12:15 – 12:30	Ellipsoidal Particle model for the Moving Particle Hydrodynamics method, **Kyuya Matsumoto***

Session F1-2 (Room P5): Mesh-free and Mesh-less method (MS13)

Chair: Mitsuteru Asai

Time	Title/Authors
15:10 – 15:30	**Invited:** Die casting simulation using MPH method, **Kentaro Akasaki**
15:30 – 15:50	**Invited:** A novel meshless formulation using a staggered variable arrangement and mesh-constrained approach for the incompressible Navier–Stokes equations, **Takeharu Matsuda***
15:50– 16:05	Fluid Simulation of a Liquid Ring Pump by the MPS Method with Gas Backflow using a Gap Model, **Zhiqiang Yang***
16:05 – 16:20	Simulation of Seawall Block Damage Using the Moving Particle Hydrodynamics (MPH) Method with Fluid-Rigid Body Interaction, **Keisuke Haneda***
16:20 – 16:35	An integrated surface and seepage flow simulator based on ALE-SPH, **Kazuma Takahashi***
16:35 – 16:50	A FD-SPH for robust fluid-rigid body coupling simulation, **Ciara Galvin***

Session F1-3 (Room P5): Mesh-free and Mesh-less method (MS13)

Chair: Kazuya Shibata

Time	Title/Authors
17:00 – 17:20	**Invited:** Numerical simulation of droplet breakup in extensional flow using a particle method, **Masanobu Bito***
17:20 – 17:35	A two-dimensional ordinary state based Peridynamic model for dynamic fracture., **Dheeraj Valecha***
17:35 – 17:50	A scalable meshfree point generation approach for efficient filling and optimization of internal particle distribution, **Fan Zhang***
17:50 – 18:05	Behavior of Simulation for Spar Type Offshore Wind Power Turbine by Particle Method, **Seiya Hagihara**
18:05 – 18:20	Fully Coupled Analysis of a Semi-Submersible Wind Turbine and Tidal Current Turbine Hybrid System, **Chao Hu***
18:20 – 18:35	Local RBF Based Meshfree Scheme to Simulate Mixed Convection in a Square Cavity with Moving Walls and Elastic Heat Sources, **Jiban Chowdhury***

Day 1: December 08, 2025, Monday

Session G1-1 (Room M1): Machine Learning in Computational Mechanics (MS01)

Chair: Fangfang Xie

Time	Title/Authors
10:50 – 11:10	**Invited:** Advancing Predictive Accuracy: Integrating Mechanics into Machine Learning for Elastoplastic Behaviour Modelling in Fiber-Reinforced Composites, **Chao Zhang**
11:10 – 11:30	**Invited:** Efficient Background Mesh Refinement with Graph Convolutional Networks for Sizing Field, **Hongfei Ye***
11:30 – 11:45	Application of real-time inundation prediction model with dimensional compression to multiple locations, **Nakayama Ryuya***
11:45 – 12:00	Deep Learning-based Automatic Recognition and Mesh Optimization for Film Cooling Holes, **Taoran Liu***
12:00 – 12:15	Development of a machine-learning based surrogate model to efficiently conduct total system performance assessments, **Gil-Eon Jeong**
12:15 – 12:30	A Large Language Model-inspired Data-driven Mechanics Framework for Viscoelastic Soft Structures, **Yicheng Lu***

Session G1-2 (Room M1): Modelling, Simulation, and AI for NDT and SHM (MS02)

Chair: Fangsen Cui & Syed Haider Mehdi Rizvi

Time	Title/Authors
15:10 – 15:30	**Invited:** 2-D Pure Anti-Plane Anisotropic Elastic Wave Scattering Analysis Using Deep Learning and Its Validation by the Boundary Element Method, **Takahiro Saitoh**
15:30 – 15:45	Hybrid Self-Attention and Graph-Recurrent Neural Network for Damage Classification in a Bridge Structure, **Syed Haider Mehdi Rizvi***
15:45– 16:00	A direct link between ultrasonic NDT and FE modelling toward SHM and a digital twin of the scarf repair, **Ryan Stickland***
16:00 – 16:15	Numerical Simulation of SH Guided Wave Propagation and Scattering in a Plate Using the Method of Fundamental Solutions, **Akira Furukawa**
16:15 – 16:30	A probabilistic geometric imperfection model for uncertainty quantification of inflatable beams with local structure instability, **Zerong Cen***
16:30 – 16:45	Strain based Formulation for Bayesian Model Updating Using Strain Modal Data, **Raj Purohit Kiran***
16:45- 17:00	Engineering Direct-Write Ultrasonic Sensors for NDT and SHM: Challenges and Solutions, **Fangsen Cui**

Session G1-3 (Room M1): Vibroacoustics of metamaterials (MS23)

Chair: Heow Pueh LEE

Time	Title/Authors
17:00 – 17:20	**Invited:** Inverse design of phase change material-based sandwich panels for thermally tunable acoustic performance, **Hyunjoon Jung***
17:20 – 17:40	**Invited:** Mechanical metamaterials in reducing vibration level of the battery pack, **Heow Pueh Lee**
17:40 – 17:55	The Influence of Wood Anisotropy on Instruments, **Misora Kojima***
17:55 – 18:10	A Modal-Based Topology Optimization Approach for Acoustic Metamaterials, **Hantao Pan***
18:10 – 18:25	Applications of numerical methods in computation acoustics, a brief review, **Tian Ran Li**
18:25 – 18:40	Thermomechanical properties of diamond nanothreads family enlightened by machine learning Potentials, **Xiaorui Chen***

Session H1-1 (Room M2): Data-driven Approaches for Analysis, Design, and Applications (MS64)

Chair: Ikjin Lee

Time	Title/Authors
10:50 – 11:10	**Invited:** A Multi-Agent LLM Framework for Improving Knowledge Transfer in Injection Molding, **Junhyeong Lee***
11:10 – 11:30	**Invited:** Diffusion-based Generative Topology Design under Uncertain Boundary Conditions, **Bumsoo Park***
11:30 – 11:45	Forecasting Long-term Spatial-temporal Dynamics with Generative Transformer Networks, **Donggeun Park***
11:45 – 12:00	Performance Study of Multi-Fidelity Surrogate Modeling for Flexible Utilization of Multiple Data, **Ikjin Lee, Youngseo Park**
12:00 – 12:15	A study on a database-driven conversational system for specific individuals, **Ruiyan Zhu***
12:15 – 12:30	3D Geometry Augmentation Guided by Engineering Uncertainty, **Yongmin Kwon***

Session H1-2 (Room M2): Advancing Data-Driven Approaches and Reduced-Order Modelling in Structural Mechanics (MS11)

Chair: Wei-Tze Chang

Time	Title/Authors
15:10 – 15:30	**Invited:** A Data-driven Model for Predicting Railway In-train Forces, **Wenyi Yan**
15:30 – 15:45	Discussion of User-defined Parameters for Subspace-based Identification using Laboratory- and Field-data, **Shieh-Kung Huang***
15:45– 16:00	Data-driven geometrically exact beam elements for structural analysis of offshore wind turbines, **Hoa Nguyen***
16:00 – 16:15	Application of Deep Learning Model for Nonlinear Response-History Analysis in Multi-Objective Design Optimization for Base-Isolated Reinforced Concrete Structures, **I-Hsiang Chang***
16:15 – 16:30	Structural Cross-Section Design Optimization via Graph-Based Reinforcement Learning Integrating Nonlinear Response-History Analysis, **Kuang-Yao Li***
16:30 – 16:45	Integrity Assessment of SNF Cladding with PCI Effects Using a Machine-Learning Surrogate Model, **Dong-Hyun Kim***

Session H1-3 (Room M2): Quantum Scientific Computing in Engineering (MS50)

Chair: Kenjiro Terada

Time	Title/Authors
17:00 – 17:20	**Invited:** Dimension Liftings for Quantum Computation of Partial Differential Equations and Related Problems, **Shi Jin**
17:20 – 17:35	Toward Quantum Speedup in Simulating Real-time Dynamics of Coupled Dissipative Classical Oscillators, **Yuan Liu***
17:35 – 17:50	Exploring Quantum Annealing for Coupled Structural Analysis Problems, **Lukas Freinberger***
17:50 – 18:05	Quantum algorithm for simulating solid vibration analysis, **Koya Wagatsuma***
18:05 – 18:20	Application of Quantum Machine Learning to Polymer Alloy Phase Separated Structures, **Mayu Muramatsu***
18:20 – 18:35	Variational Quantum Topology Optimization, **Yan Wang**

Day 1: December 08, 2025, Monday

Session I1-1 (Room M5&6): General Topics Related to Computational Mechanics (MS68)

Chair: Richard Yang

Time	Title/Authors
10:50 – 11:05	Lightweight Auxetic Seismic Metamaterials for Low-Frequency Seismic Wave Attenuation, **Tzu Kang Lin**
11:05 – 11:20	Design of new interlocking elements and evaluation of their dynamic performance, **Siya Wang**
11:20 – 11:35	Transient Analysis of Nearly Incompressible Hyperelasticity by Using Stabilized Finite Element Scheme and Mixed Time Integrator, **Takahiro Yamada**
11:35 – 11:50	Buckling and optimization of arches based on Hencky bar-chain model, **Jinming Zhang***
11:50 – 12:05	Predicting Residual Tensile Strength of Fibre Reinforced Polymer Composite Laminates Subjected to Laser Irradiation via Numerical Modelling, **Patrick Kamlade***
12:05 – 12:20	Performance Evaluation of Carbon Fibre Plate-Inserted Shoes through Human-Shoe Coupled Dynamic Analysis, **Koju Higashide***
12:20 – 12:35	High-fidelity Multiphysics Modeling of Metal Additive Manufacturing Process, **Zhilang Zhang**

Session I1-2 (Room M5&6): General Topics Related to Computational Mechanics (MS68)

Chair: Xiaowei Gao

Time	Title/Authors
15:10 – 15:25	Linearly Implicit, High-Order Time Integration for Multi-physics Simulation, **David Petty**
15:25 – 15:40	High-order explicit time integration with controllable numerical damping, **Daniel O'Shea**
15:40– 15:55	Luxury Cruise Ship Vibration and Noise Analysis of Modular Cabin Systems, **Junyi Liu***
15:55 – 16:10	Numerical Analysis of Reduced Basis Methods for Steady Thermal-Convection Problems, **Daisuke Tagami**
16:10 – 16:25	Nonlinear dynamic and stability analysis of piezoelectric smart plates and shells considering piezoelectric nonlinearity, **Yu Zhang***
16:25 – 16:40	High-Order Mesh R-Adaptivity with Tangential Relaxation and Guaranteed Mesh Validity, **Ketan Mittal**

Session I1-3 (Room M5&6): Advance and Application of Meshfree Methods (MS12)

Chair: Kuan-Chung Lin

Time	Title/Authors
17:00 – 17:20	**Invited:** A Hybrid iFEM-NOSPD Model for Structural Health Monitoring of Damaged Structures, **Shr Chi Lin*, Ming-Jyun Dai***
17:20 – 17:35	Analyzing elastic half-spaces with cavities under wave loads using an RK dynamic infinite meshfree method, **Kuan-Chung Lin**
17:35 – 17:50	Integrated radial basis function networks for solving PDEs under the embedded boundary framework, **Nam Mai-Duy**
17:50 – 18:05	Discrete element modelling of electro-mechanical behaviour in modified cementitious materials, **Thang Nguyen***
18:05 – 18:20	Metastructure with gradient zigzag beams and masses, **Jung-San Chen**
18:20 – 18:35	Multi-scale analysis of structure damage behaviour using isogeometry analysis and generative adversarial network, **Hong-Wun Hsiao**

Session J1-1 (Room M7&8): Numerical Methods for Contact, Damage, and Fracture Mechanics (MS36)

Chair: Jianguang Fang

Time	Title/Authors
10:50 – 11:10	**Invited:** Phase-field modeling of creep crack propagation using isogeometric analysis, **Tiantang Yu**
11:10 – 11:30	**Invited:** Enhanced Iterative Solvers for Coupled Problems: Overcoming the Slow Convergence of Staggered Schemes, **Yongxing Shen**
11:30 – 11:45	Numerical analysis of crack growth in mud wall's structure using phase field fracture model, **Takeshi Takaishi**
11:45 – 12:00	Phase field fracture modelling for elastoplastic shell incorporated with stress-state-based fracture initiation, **Yang Jiang***
12:00 – 12:15	Towards Unified AI-Driven Fracture Mechanics: The Extended Deep Energy Method (XDEM), **Yizheng Wang***
12:15 – 12:30	A phase field model to simulate concrete fracture behaviour under elevated temperatures, **Timo Saksala**

Session J1-2 (Room M7&8): Numerical Methods for Contact, Damage, and Fracture Mechanics (MS36 & MS17)

Chair: Jianguang Fang & Yan Li

Time	Title/Authors
15:10 – 15:25	Optimization of CFRP Structures Tailored for Additive Manufacturing Performance, **Yanan Xu***.
15:25 – 15:40	A general phase-field model for electrical degradation and breakdown under electro-thermo-mechanical loading, **Federico Fuentes**.
15:40– 15:55	Robust Topology Optimization of FRP Composite Structures under Dynamic Load Uncertainties, **Furong Xie***.
15:55 – 16:10	MD Simulation of Effect of Physical Cross-linkages on Mechanical Properties of Polymer Chains' Network**, Isamu Riku**.
16:10 – 16:25	The development of new analysis method for aluminum wheel rim deformation using simple tire model and discussion of test error, **Jinhee Jang**.
16:25 – 16:40	A Straightforward yet Effective Approach to Predict the P-I Diagrams of RC Beam during Design Process, **Hyunseung Chung***.

Session J1-3 (Room M7&8): Numerical Methods for Contact, Damage, and Fracture Mechanics (MS17)

Chair: Yan Li & Pihua Wen

Time	Title/Authors
17:00 – 17:20	**Invited:** Contact Wear Analysis Based on Variable Friction Coefficient Models, **Yan Li**
17:20 – 17:40	**Invited:** Modelling of Competitive Failure Behaviour of CFRP Stepped-lap Repairs under Various Design Parameters, **Xiao Han**
17:40 – 17:55	An experimental calibration method for fatigue life prediction of bonded joints with dissimilar composites, **Hee-Chan Song***
17:55 – 18:10	Effects of structural details on brittle crack arrestability in thick cross-joint components under different propagation scenarios, **Tianyu He***
18:10 – 18:25	A Differentiable Variational Framework for Contact and Fracture, **Mirko Ciceri***
18:25 – 18:40	Development of a Stress Intensity Factor Solution for Cracks in a Small Modular Reactor Vessel, **Heejun Yang***

Day 1: December 08, 2025, Monday

Session K1-1 (Room M9): Advances in Computational Methods in Infrastructure Systems and Engineering (MS66)

Chair: Yuan-Lung Lo

Time	Title/Authors
10:50 – 11:10	**Invited:** Virtual Specimen Generation of Heterogeneous Materials Incorporating Microstructural and Interfacial Characteristics, **Ji-Su Kim**
11:10 – 11:30	**Invited:** Influence of solid phase homogeneity on the properties of foamed concrete using numerical analysis, **Sang-Yeop Chung***
11:30 – 11:45	Polyhedral Discretization and Analysis for Complex Geometry, **Kyoungsoo Park***
11:45 – 12:00	Design of SILS Architecture for Hydrogen Fuel Cell of Unmanned Underwater Vehicle, **Hyungwoo Kim***
12:00 – 12:15	CycleGAN based 3D multiphase microstructure reconstruction method preserving real microstructural characteristics, **Tong-Seok Han**
12:15 – 12:30	Numerical modelling approach for tunnelling forces on excavation pit wall supports in soft soil using 2D hydro mechanical FE model, **Grace Stapley**

Session K1-2 (Room M9): Advances in Thermal Management and Energy Storage: Innovations in Hydrogen and Sustainable Applications (MS51 & MS66)

Chair: Sang-Yeop Chung & Saidul Islam

Time	Title/Authors
15:10 – 15:30	**Invited:** Enhancing Heat Transfer with Perforated Vortex Generators, **Yidie Luo***
15:30 – 15:45	A Combined Quadtree-Octree Partitioning Framework for Parallel FEM Model Generation and Analysis Applied to 3D Parametric Modelling of Shear Wall-Frame Structural Systems, **Pher Errol Quinay**.
15:45– 16:00	Computational Fluid Dynamics Analysis of Metal Hydride Hydrogen Storage Performance, **Saidul Islam**
16:00 – 16:15	Optimizing Energy Forecasting in Low-Energy Houses: A Data-Driven Feature Selection Approach, **Gongli Li***
16:15 – 16:30	Analysis of Phase Change Materials Undergoing Close-Contact Melting for Thermal Management Applications, **Daut Mustafic***

Session K1-3 (Room M9): Computational Modelling of Infrastructure Assets and Large-scale Computational Mechanics (MS10 & MS60)

Chair: Lihai Zhang & SangJoon Shin

Time	Title/Authors
17:00 – 17:15	Life Cycle Assessment of Reinforced Concrete Panel Considering Multi-Ion Corrosion: A Coupled Chemical and Electrochemical Model, **Boran Zhang***.
17:15 – 17:30	Assessing the Structural Reliability of Cladding Panels Under Hail Impact, **Shuangmin Shi**.
17:30 – 17:45	An efficient finite element method for recertification of aircraft component after repair, **Nathakorn Prajunban***.
17:45 – 18:00	Fast Urban Flood Model for Real-time Flood Management, **Maziar Korzani**.
18:00 – 18:15	Quasistatic Thermomechanical Simulation with Peridynamics, **Sunwoo Kim***.
18:15 – 18:30	Multi-task Approach to Physics-informed Deep Operator Network for Electromagnetic Scattering Analysis, **Hyejin Kim***.

Day 2: December 09, 2025, Tuesday

Session A2-1 (Room PTR): Computational fluid dynamics simulation: flow prediction and application (MS30)

Chair: Yusuke Nabae

Time	Title/Authors
10:50 – 11:05	Investigating bubble injection, detachment, and rise behaviour using the phase-field lattice Boltzmann method, **Xiaobo Yao***
11:05 – 11:20	Gravitational Instability and Flow Reversal in Open Cavity Mixing: An Investigation using the Lattice Boltzmann Method, **Zhongzheng Wang**
11:20 – 11:35	Investigation of Curvature and Stretch Effects on Nox formation in Turbulent Ammonia-Methane Blended Flames by DNS, **Takumi Suwabe***
11:35 – 11:50	Numerical Investigation of Solid Particle Erosion in U-Bend Geometries: Influence of Rotation and Surface Roughness, **Luis Miguel Gonzalez Arango***
11:50 – 12:05	CFD-Based Investigation of Primary Droplet Breakup from an Impaction-pin nozzle: Towards Predictive Models for Spray-Induced Plume Formation, **Saima Bukhat Khan***
12:05 – 12:20	Dissimilar Control of Momentum and Heat Transport in Turbulent Channel Flow using Deep Reinforcement Learning, **Tatsuya Katsumata***

Session A2-2 (Room PTR): No Presentation

Time	Event
19:00 – 22:00	**Banquet**

Session A2-3 (Room PTR): No Presentation

Time	Event
19:00 – 22:00	**Banquet**

Session B2-1 (Room P1): Computational Biomechanics (MS20)

Chair: Kwong Ming Tse

Time	Title/Authors
10:50 – 11:10	**Invited:** Wrist Finite Element Model for Wrist Biomechanics Analysis and Pathology Treatment, **James Yang**
11:10 – 11:30	**Invited:** Advanced Topology Optimisation for Porous Hip Implants: Bridging in Silico Models and In Vitro Tests, **Kwong Ming Tse**
11:30 – 11:45	Surface electromyography (sEMG) based approach to terrain recognition for assisting control of transfemoral prosthesis, **Faiza Rasheed***
11:45 – 12:00	Membrane vesicles embedded with multiple curved proteins subjected to osmotic pressure: Monte Carlo simulations, **Long Li**
12:00 – 12:15	Cellular aggregate formation: continuum modelling and computational implementation, **Soheil Firooz***
12:15 – 12:30	Oral Inhalation: Understanding Physiologically Realistic Changes of the Human Upper Airway, **Brenda Vara Almirall***

Session B2-2 (Room P1): Computational Biomechanics (MS20)

Chair: Kwong Ming Tse

Time	Title/Authors
15:10 – 15:30	**Invited:** Real-time predictions of primary stability in reverse shoulder arthroplasty, **Saulo Martelli**
15:30 – 15:50	**Invited:** Nature's Design: Optimal Functional Balance Behind Fractal Morphology of Leaf Veins, **Dong Li**
15:50– 16:05	Transportation of Silver Diamine Fluoride in Hydroxyapatite Nanostructure: A Molecular Dynamics Study, **Qingyun Wang***
16:05 – 16:20	Pulse Dynamics as Indicators of Musculoskeletal Pain, **Nien Tzu Kao**
16:20 – 16:35	Computational Models of Porosity-Dependent Bone Mineralisation and their Link to Bone Mechanical Properties, **Corinna Modiz***
16:35 – 16:50	Explicit Solvent Modeling in Protein Dynamics Using Mixed Overlapping Element, **Giseok Yun***

Session B2-3 (Room P1): Computational Biomechanics (MS20)

Chair: Kwong Ming Tse

Time	Title/Authors
17:00 – 17:20	**Invited:** Numerical Simulation of Bone Regeneration in Architecturally Heterogeneous Scaffolds for Large Segmental Defects, **Ali Entezari***
17:20 – 17:35	Finite Element Analysis of Stress Distribution in Anterior Cervical Fusion According to Implant Type, **Sungwook Kang**
17:35 – 17:50	Quantifying irregular pulsation of intracranial aneurysms using 4D-CTA, **Hujin Xie**
17:50 – 18:05	In-vivo Blood Flow Simulation with Moving Wall Boundary for Patients with Atrial Fibrillation, **Han Yu**
18:05 – 18:20	Effects of Tibial Fracture-Induced Gait Alterations on Healing Outcomes: Implications for Patient-Specific Rehabilitation Strategies, **Qianjun Ding***
18:20 – 18:35	A probabilistic Atlas of Hemodynamics in the Major Cerebral Arteries through Statistical Geometric Analysis and Blood Flow Simulation, **Marie Oshima**

Day 2: December 09, 2025, Tuesday

Session C2-1 (Room P2): Shape and Topology Optimization for Industrial Applications (MS42)
Chair: Shun Ogawa

Time	Title/Authors
10:50 – 11:05	Topology optimization of thermomechanical problems considering eigenvalue effects, **Shuya Onodera**
11:05 – 11:20	Shear wall layout optimisation with a gradient based method, **Benjamin Pollock***
11:20 – 11:35	Topology Optimisation of Self-Sensing Soft Robotic Grippers, **Connor Mallon**
11:35 – 11:50	Shape design optimization of magnetic actuator using isogeometric boundary element method, **Minho Yoon**
11:50 – 12:05	Topology optimization for ITR-free thermal metadevices, **Garuda Fujii**
12:05 – 12:20	A Fictitious Physical Model for Multi-Observation-Point Visibility Evaluation in Structural Design, **Xiao Huang***

Session C2-2 (Room P2): Shape and Topology Optimization for Industrial Applications (MS42)
Chair: GilHo Yoon

Time	Title/Authors
15:10 – 15:30	**Invited:** Topology Optimization of Creep Deformation Minimization Problems Based on Norton Model, **Shun Ogawa**
15:30 – 15:45	Adaptive Robust Bayesian Framework for Optimising Battery-Cooling Microchannel Heat Exchangers, **Hao Zhou***
15:45– 16:00	Composite Airframe Structural Repair Patch Topology Optimisation, **Vishnu Shankar Nair***
16:00 – 16:15	Multiscale Topology Optimization for Thermal-Fluid Systems Using Variational Autoencoders, **Toru Abo***
16:15 – 16:30	Rotorcraft Gearbox Housing Design using Additive Manufacturing and TPMS Lattice Structure, **Jaeseung Kim**
16:30 – 16:45	Interlocking Joints Generation Method for Multi-component Topology and Shape Optimization Using Dimensional and Interfacial Stress Constraints with Quadratic Stress Criterion, **Yukun Feng***

Session C2-3 (Room P2): Topology Optimization for Industrial Applications (MS42) & Kernel and machine learning-based solutions of PDEs (MS06)
Chair: Takayuki Yamada & Elena Atroshchenko

Time	Title/Authors
17:00 – 17:20	**Invited:** Multiscale Topology Optimization for Reducing Dynamic instability, **SolJi Han*, GilHo Yoon***.
17:20 – 17:35	An Enhanced Bi-directional Evolutionary Structural Optimization Method Considering Stress Constraints and Elastoplastic Materials, **Pei Chen Ko***.
17:35 – 17:50	Physics-Informed Deep Energy Approach with Phase-Field Modeling for Coupled Thermo-Mechanical and Hydro-Mechanical Fracture, **Han Zhang***.
17:50 – 18:05	A Physics-Informed Gaussian Process Regression Method to Infer Stokes Flows: Theory and Applications, **John Molina**.
18:05 – 18:20	PINNs for Forward and Inverse VBI Problems with Applications to Structural Damage Detection, **Elena Atroshchenko**.
18:20 – 18:35	Generating Solutions for Partial Differential Equation by using Physics-Guided Generative Adversarial Networks, **Cangfeng Wei***

Session D2-1 (Room P3): New trends in computational optimization design and its applications (MS38)
Chair: Xiaodong Huang

Time	Title/Authors
10:50 – 11:10	**Invited:** Bound states in the continuum induced by topology optimisation, **Weibai Li***
11:10 – 11:30	**Invited:** Integrated Topology and Path Optimization for Fiber-Reinforced Composite Structures with Concentric Printing Paths, **Cong Wang**
11:30 – 11:45	On the formulation of finite strain multi-material topology optimization, **Jike Han**
11:45 – 12:00	Level-set topology optimisation with distributed unfitted finite elements and automatic shape differentiation, **Zach Wegert***
12:00 – 12:15	Topology Optimization Using a Fourth-Order Reaction-Diffusion Level Set Method, **He Li***
12:15 – 12:30	Topology Optimization of Mode-Converting Metamaterials for Obliquely Incident Elastic Waves, **Yoon Young Kim**

Session D2-2 (Room P3): New trends in computational optimization design and its applications (MS38)
Chair: Takayuki Yamada

Time	Title/Authors
15:10 – 15:30	**Invited:** A Quick Synthetic System for Rarefied Gas Flows by Solving the Gas-kinetic Equation, **Kaiwen Guan***
15:30 – 15:50	**Invited:** Failure-Aware Topology Optimization of CFRP Structures for Additive Manufacturing: Integrating the Tsai-Wu Criterion, **Yanan Xu***
15:50– 16:05	Machine Learning-aided Robust Optimization of Frequency Selective Surfaces with Ultrawide Passbands, **Minghui Zhang**
16:05 – 16:20	Improved Basis-screening Kriging Method using Penalized Maximum Likelihood Estimation for Structural Optimization, **Mingeun Kim**
16:20 – 16:35	Biomechanical Analysis of Resection Angles in Mandibular Reconstruction, **Yiqi Wang***
16:35 – 16:50	A Novel Two-Body Topology Optimization Framework for Strain Energy Minimization Problem, **Siyue Chang***

Session D2-3 (Room P3): New trends in computational optimization design and its applications (MS38 & MS42)
Chair: Chi Wu & Qing Li

Time	Title/Authors
17:00 – 17:20	**Invited:** Differentiable Programming for Solving Nonlinear Inverse Problems, **Tianju Xue**
17:20 – 17:40	**Invited:** Density-Based Topology Optimization Using Subloading Surface Model of Elastoplasticity, **Junji Kato**
17:40 – 17:55	Three-Dimensional Topological Derivatives in Anisotropic Elasticity: Theory and Applications, **Yi Cui***
17:55 – 18:10	Latent Diffusion Model for Inverse Design of Nonlinear Mechanical Metamaterials, **Huiyu Wang***
18:10 – 18:25	A Fully Eulerian Approach for Transient Fluid-Structure Interaction Topology Optimization, **Ryohei Katsumata***
18:25 – 18:40	Flow Field Design of Redox Flow Batteries via homogenization-based topology optimization, **Yuya Onoda***

Day 2: December 09, 2025, Tuesday

Session E2-1 (Room P4): Scientific AI: Physics-informed ML, Topology Optimization, and Industrial Applications (MS03)

Chair: Jae Hyuk Lim

Time	Title/Authors
10:50 – 11:10	**Invited:** Physics-Informed Laplace Neural Operator for Learning Differential Equations, **Minseok Choi**
11:10 – 11:25	Structural Analysis of Multi-domain System Using Deep Operator Network, **Chanho Kim***
11:25 – 11:40	Electromagnetic Field Prediction of Electric Motor Using Deep Operator Network, **Jeonguk Myeong***
11:40 – 11:55	Point-based Diffusion Model for Predicting Spatio-Temporal Dynamics in Physical Systems, **Jiyong Kim***
11:55 – 12:10	Stress-based Multi-material Design by Floating Projection Topology Optimization, **Yuhan Gong***
12:10 – 12:25	Application of Neural Operators to Inverse Problems in Solid Mechanics Based on Randomly Generated Training Data, **Hiroki Kamada**

Session E2-2 (Room P4): Scientific AI: Physics-informed ML, Topology Optimization, and Industrial Applications (MS03)

Chair: Jaewook Lee

Time	Title/Authors
15:10 – 15:25	Image-Physics Driven Topology Optimization Method with Integrating Biological Features, **Xiaohong Ding**
15:25– 15:40	PINN for Predicting Grain Structure Evolution Governed by the Allen-Cahn Equation, **Jaejung Park***
15:40 – 15:55	DeepSDF-Powered 3D Generative AI: Training and Validation using 21,998 Eulerian Elastoplastic Simulations, **Koji Nishiguchi**
15:55 – 16:10	Real-time dynamic response estimation of beam/plate system using a physics-informed machine learning considering temporal causality, **Jeong-Hoon Park***.
16:10 – 16:25	Real-time Response Estimation of Time-Dependent PDEs via Causality-Aware Physics-Informed Machine Learning: Robustness to Unmodeled Effects, **Hong-Kyun Noh***
16:25 – 16:40	FE-PINN: A Hybrid Optimization Framework Integrating Finite Elements and PINN, **Sibo Feng***.

Session E2-3 (Room P4): Scientific AI: Physics-informed ML, Topology Optimization, and Industrial Applications (MS03) & Computational Geosciences (MS53)

Chair: Jae Hyuk Lim

Time	Title/Authors
17:00 – 17:20	**Invited:** Learning Hyperelastic Material Models via PINNs with Minimal Experimental Data, **Hyeonbin Moon***
17:20 – 17:35	A Novel Framework for Calibrating DEM Models of Geo-materials, **Shuaifeng Lu***
17:35 – 17:50	Evaluating Soil Movement in Underpass Frame Bridges with Finite Element Method, **Fang Dong***
17:50 – 18:05	A Matlab-Based Computer Vision-Aided Triangular Mesh Generator for High-Fidelity Grain-Based Model, **Zihan Liu***
18:05 – 18:20	Topographical Effects in a Fully Saturated Alluvial Valley, **Swetha Veeraraghavan**
18:20 – 18:35	Temperature-Dependent SWRC Model for Expansive Soils Considering Bound Water Dehydration, **Miao Yu***

Session F2-1 (Room P5): Scaled boundary finite element methods (MS14)

Chair: Shouyan Jiang

Time	Title/Authors
10:50 – 11:10	**Invited:** Simulation of Concrete Compression and Shear Failure Based on Three-Dimensional Scaled Boundary Finite Element Method, **Chengbin Du**
11:10 – 11:30	**Invited:** A Scaled Boundary Finite Element Formulation Based on Isoparametric Mapping, **Ooi Ean Tat**
11:30 – 11:45	A Face-Scaling Scaled Boundary Finite Element Method for Plate and Shell Member Simulation, **Bingqi Li**
11:55 – 12:00	Hydraulic fracture simulation of meso-concrete using the SBFEM-FVM model, **Liguo Sun**
12:00 – 12:15	An implementation of the scaled boundary FEM for three-dimensional elastoplastic analysis, **Yunxuan Cui**
12:15 – 12:30	Octree Pattern-Based Scaled Boundary Finite Element Modelling for Static Analysis of Porous Structures, **Yige Wang***

Session F2-2 (Room P5): Scaled boundary finite element methods (MS14)

Chair: Da (Daniel) Chen

Time	Title/Authors
15:10 – 15:30	**Invited:** Transgranular and intergranular fracture modelling in brittle polycrystals using the scaled boundary FEM, **Carolin Birk**
15:30 – 15:50	**Invited:** Data-driven algorithm based on the scaled boundary finite element method and deep learning for crack detection in large-scale structures, **Shouyan Jiang**
15:50– 16:05	Numerical homogenisation of porous composite materials via Scaled Boundary Finite Element Method, **Da (Daniel) Chen**
16:05 – 16:20	Pattern-based Massively Parallel Mesh Generation and Analysis with the Scaled Boundary Finite Element Method, **Yifan Zhan, Chongmin Song**
16:20 – 16:35	A scaled boundary finite element method for coupled soil-structure interaction analysis using non-matching meshes, **Pengcheng Liu**
16:35 – 16:50	Dynamic Fracture Analysis by Polygonal Scaled Boundary Finite Element Method, **Yazhou Zhang***

Session F2-3 (Room P5): Scaled boundary finite element methods (MS14) & Advances in BIE/BEM (MS67)

Chair: Yijun Liu

Time	Title/Authors
17:00 – 17:15	Development of Fast Boundary Element Method and Machine Learning, **Yijun Liu**
17:15 – 17:30	Derivative Relationships of Commonly Used Numerical Methods and Their Performance Analysis of Accuracy, Stability and Efficiency, **Xiao-Wei Gao**
17:30 – 17:45	A novel multi-material topology optimization method for acoustic-structure interaction system based on a multi-resolution approach, **Xinyue Lin***
17:45 – 18:00	High-accuracy isoparametric closure boundary elements and their applications in mechanics analysis, **Yongtong Zheng**
18:00 – 18:15	SH-wave scattering in the orthotropic half-plane containing a hill using the boundary integral quadrature method, **Jia-Wei Lee**
18:15 – 18:30	Adaptive phase-field cohesive zone model for simulation of mixed-mode interfacial and bulk fracture in heterogeneous materials with directional energy decomposition, **Peiliang Bian**

Day 2: December 09, 2025, Tuesday

Session G2-1 (Room M1): CFD and Fluid-structure Interaction (FSI): Methods and Applications (MS28 & MS16)

Chair: Fangbao Tian & Shibo Kuang

Time	Title/Authors
10:50 – 11:10	**Invited:** Vortex-foil Interaction and Motion Optimization for Energy Harvesting, **Hong Ren***
11:10 – 11:30	**Invited:** Flow-Induced Vibrations in Compressible Flows using a Hybrid Immersed Boundary-Lattice Boltzmann Method, **Vigneshwaran Rajendran***
11:30 – 11:45	Studying debris and flood flow in complex topographies and mitigating structures using the VOF method, **Gholamreza Kefayati**
11:45 – 12:00	A comprehensive model for H2-intensive shaft furnaces, **Yang Fei***
12:00 – 12:15	FSI study of flapping wing geometry effects in compressible flows, **Xi Lin***
12:15 – 12:30	RITTER-KRIŽAIĆ iteration method of Flat truss constructions, **Vladimir Križaić**

Session G2-2 (Room M1): CFD, FSI, and Multiphysics simulation in biomedical engineering (MS32)

Chair: Xinying Liu

Time	Title/Authors
15:10 – 15:30	**Invited:** Modelling requirements for resolving physiological functions of respiratory airflow, **Kiao Inthavong**
15:30 – 15:50	**Invited:** A Validated Fluid Structure Interaction Simulation Methodology for Flow in Blood Vessels, **David Fletcher**
15:50– 16:05	Fluid-structure interaction analysis of bioinspired polymeric heart valves with experimental validation, **Xinying Liu**
16:05 – 16:20	Insights into airflow characteristics during the onset of respiratory arrest, **Matthew Cook***
16:20 – 16:35	Particle tracking in a nasal to 51 hermos-bronchial airway using a scale resolving simulation, **Patrick Warfield-McAlpine***
16:35 – 16:50	Assessing Potential Pressure Recovery in Coronary Tandem, **Navid Freidoonimehr**

Session G2-3 (Room M1): CFD, FSI, and Multiphysics simulation in biomedical engineering (MS32)

Chair: Xinying Liu

Time	Title/Authors
17:00 – 17:20	**Invited:** Breakdown of soft food solids in the stomach from coupled mechanical and chemical processes using an SPH based model, **Paul Cleary**
17:20 – 17:35	A Highly Scalable Parallel Algorithm for Non-Newtonian Blood Flow in Intracranial Aneurysm, **Shanlin Qin**
17:35 – 17:50	Numerical Simulation of Fluid-Structure Interaction in Soft Cylindrical Actuators, **Aquib Siddiqui***
17:50 – 18:05	Leveraging dielectrophoresis in inertial flow for versatile manipulation of micro and nanoparticles, **Jun Zhang**
18:05 – 18:20	Numerical Evaluation of a Novel Mechanical Heart Valve Design, **Qiuxiang Huang**

Session H2-1 (Room M2): Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics (MS19)

Chair: Mitsuteru Asai

Time	Title/Authors
10:50 – 11:10	**Invited:** Overlapping finite element 51 hermos 51 g of hyperelastic materials, **Zhilong Jiang***
11:10 – 11:30	**Invited:** A 3D Generative Framework Integrating Time-Series Data from Eulerian Structural Analysis, **Koichiro Nakaya***
11:30 – 11:45	Homogenization Analysis using s-version Isogeometric Analysis (s-IGA), **Daigo Tanaka***
11:45 – 12:00	Stabilized DeepSDF with Local Feature Weighting for Robust Thin-Plate Generation, **Sora Takanezawa***
12:00 – 12:15	A RPIM-Based Extrinsic Enriched Finite Element Method for the Helmholtz Equation, **Qingliang Liu***
12:15 – 12:30	A mesh refinement method for isogeometric analysis based on the T-image and Bézier extraction, **Yuma Akutagawa***

Session H2-2 (Room M2): Advanced machine learning methods for multiscale and materials modelling (MS05)

Chair: Tung-Huan (Michael) Su

Time	Title/Authors
15:10 – 15:30	**Invited:** NiTi Neural Network Interatomic Potential for Defect Mechanics, **Nien-Ti Tsou**
15:30 – 15:50	**Invited:** Elastic and In-elastic Behaviour of Silicon Carbide Crystals by Using Newly developed Machine-learning Potential, **Ken-ichi Saitoh**
15:50– 16:05	An artificial neural network interatomic potential to reproduce dislocations in silicon, **Atsuo Hirano**
16:05 – 16:20	Advances of AI-enabled material multiscale modelling in LS-DYNA, **Tung-Huan Su**
16:20 – 16:35	Generalizable Deep Material Networks for Polycrystalline and Composite Materials: Incorporating Graph Neural Networks and Foundation Models, **Ting-Ju Wei***
16:35 – 16:50	Extension of Weighted Equation Physics-Informed Neural Networks to Shallow Water Problems, **Nam Tuan Nguyen***
16:50 – 17:05	Origins of Mixed Quantum Well Width in 2D Perovskite from Machine Learning-enabled Multiscale Simulations, **Chun-Wei Pao**

Session H2-3 (Room M2): Advanced machine learning methods for multiscale and materials modelling (MS05)

Chair: Ting-Ju Wei

Time	Title/Authors
17:00 – 17:20	**Invited:** Machine Learning-Driven Exploration of the Mechanical Properties of Non-Equiatomic FeCoNiCrTi High-Entropy Alloys, **Hsin-An Chen**
17:20 – 17:35	Physics-Augmented Neural Network for Constitutive Modelling of Meniscal Root with Meshfree Simulation of Knee Joint Contact, **Yu-Chun Chou***
17:35 – 17:50	Structure-to-Stress: cGAN-Based Direct Modeling of Composite Material Stress-Strain Curves, **Kuan-Ying Chen***
17:50 – 18:05	Study on Two-Dimensional Functional Materials via Deep-Learning Molecular Dynamics, **Dongyu Bai***
18:05 – 18:20	Asymptotic Crack-tip Enriched Neural Network for Modeling Brittle Fracture Problems, **Rutuja Tangade***
18:20 – 18:35	Transformer-Based Temporal Prediction of Hydrodynamic Forces on Ventilated Cavitating Vehicles Using Multi-Sensor Pressure Sequence, **Renfang Huang**

Day 2: December 09, 2025, Tuesday

Session I2-1 (Room M5&6): Recent advances in computational fracture mechanics and failure analysis (MS37)

Chair: Yoshitaka Wada

Time	Title/Authors
10:50 – 11:05	Evaluation of crack propagation criterion under extremely low cycle fatigue, **Yoshitaka Wada**
11:05 – 11:20	Distribution of stress intensity factors around a sharp 3D jointed corner between dissimilar materials under combined loads, **Toru Ikeda**
11:20 – 11:35	Stress triaxiality-dependent cohesive zone model and its application to ductile crack growth analysis in C(T) specimen, **Yanlong Li***
11:35 – 11:50	A Robust S-IGA Framework for Finite Strain Elastoplasticity Using Blending Strategies, **Yuhi Tsuchiyama**
11:50 – 12:05	Three-dimensional Grain-Based Hybrid Finite-Discrete Element Modelling of Shear Fracturing of Heterogeneous Rocks under Coupled Static and Dynamic Loads, **Muhammad Kamran***
12:05 – 12:20	Simulation of Crack Path Instabilities in Quenched Glass **Plate, Sayako Hirobe**

Session I2-2 (Room M5&6): Recent advances in computational fracture mechanics and failure analysis (MS37)

Chair: Yoshitaka Wada

Time	Title/Authors
15:10 – 15:25	From linear elastic to finite strain elastoplastic fracture analysis using the Fragile Points Method (FPM), **Kengo Murakoshi***
15:25 – 15:40	Compression After Impact test analyses of CFRTP laminates by the extended Finite Element Method, **Toshio Nagashima**
15:40– 15:55	A study on the development of a crack propagation analysis using s-version isogeometric analysis (s-IGA), **Takumi Tokutome***
15:55 – 16:10	3-D tetrahedral mesh generation based on advancing front method and its application to fracture mechanics, **Hiroshi Kawai**
16:10 – 16:25	Nanoscale Elasticity and Adhesion of Solid-state Electrolyte, **Linchun He**
16:25 – 16:40	Gaussian process regression model for efficient prediction of pressure capacity in nuclear structural components**, Seongno Lee***

Session I2-3 (Room M5&6): Numerical modelling & computational methods of bio-inspired metamaterials (MS22 & MS27)

Chair: Fengxiang Xu

Time	Title/Authors
17:00 – 17:15	Tunable compression response and enhanced mechanical properties of bio-inspired lattice structures with dual-stage stiffness, **Yifan Zhu**
17:15 – 17:30	Concentration-Dependent Interaction of Polystyrene Nanoplastic with Alveolar Fluid Mediated Lung Surfactant Monolayer, **Shuvra Debnath & Suvash Saha**
17:30 – 17:45	On the interlocking profile of nacre-like materials: design, optimization and fabrication, **Reza Shakibanezhad**
17:45 – 18:00	On the Effective Bounds of Semi-auxetic Laminates, **Zia Javanbakht**
18:00 – 18:15	Data-driven Design of Bio-inspired Perturbated Vertex-based Hierarchical Honeycomb for Improved Energy Absorption, **Yinan Zhu***

Session J2-1 (Room M7&8): Mathematical Modelling and Simulation for Social, Environmental, and Disaster Prevention Issues (MS55)

Chair: Shinobu Yoshimura

Time	Title/Authors
10:50 – 11:10	**Invited:** Super-simulations of Floating Offshore Wind Turbine on Fugaku, **Shinobu Yoshimura**
11:10 – 11:30	**Invited:** Advances in Physics informed machine learning for PDEs in computational mechanics, **Zhuojia Fu**
11:30 – 11:45	Analysis of Debris Capture Behavior in Permeable Sediment Control Dams, **Haruka Furusato***
11:45 – 12:00	Motion Pictogram Generation using Generative AI and Pre-Trained Models, and Usability Evaluation, **Natsumi Okatani***
12:00 – 12:15	Immediate Large-area Prediction Model of Rainfall-induced Landslides Using Slope Stability Analysis, **Kenta Tozato***
12:15 – 12:30	Microscopic Traffic Flow Simulation Considering Electric Vehicles Charging Fee Strategy, **Kentaro Ozawa***

Session J2-2 (Room M7&8): CFD-DEM of Multiphase Flow: Modelling and Applications (MS31)

Chair: Mohammad Saidul Islam

Time	Title/Authors
15:10 – 15:30	**Invited:** Physics-guided computational model for airborne inhaled transmission of pox viruses, **Saikat Basu** LEDDS:
15:30 – 15:50	**Invited:** Acoustic Drug Delivery to Paranasal Sinuses: Particle Size Impact, **Oveis Pourmehran***
15:50– 16:05	A C++ based Portable and Efficient CFD-DEM Solver for Particle-Fluid Simulations, **Christophe Coreixas**
16:05 – 16:20	CFD-DEM study of particle triboelectrification in pneumatic conveying, **Fayuan Huang***
16:20 – 16:35	Analysis of the initiation of motion of alluvial river-beds of different particle size using CFD-DEM approach, **Saugat Shrestha***
16:35 – 16:50	Modelling Density-driven Segregation in Submerged Granular Shear Flows, **Yu Chen***

Session J2-3 (Room M7&8): Numerical modelling in computational medicine (MS48 & MS46)

Chair: Feng-Nan Hwang

Time	Title/Authors
17:00 – 17:15	Machine learning-based assessment of liver fibrosis using animal models and human clinical data, **Feng-Nan Hwang**
17:15 – 17:30	Parallel Domain Decomposition Methods for Multi-organ Blood Flow Simulations, **Rongliang Chen**
17:30 – 17:45	A Parallel Implicit Algorithm for Simulating Patient-specific Human Heart, **Xiao-Chuan Cai**
17:45 – 18:00	Validated Finite element predictions of the stability of graft fixation for latarjet surgery, **Hamid Reza Jarrah***
18:00 – 18:15	Enhancing Accuracy of Statistical Shape Models for Predicting Tooth Root Morphology, **Ryosuke Kusama***
18:15 – 18:30	Deformation Toolbox: A MATLAB-Based Program to Morph the Geometry of the Models while Preserving Mesh Quality, **Alireza Yahyaiee Bavil***

Day 2: December 09, 2025, Tuesday

Session K2-1 (Room M9): Recent advances in Nanocomposite Structures (MS21)

Chair: Yingyan Zhang

Time	Title/Authors
10:50 – 11:10	**Invited:** Mechanical analysis of opto-electro-thermo-elastic perovskite structures, **Shaoyu Zhao**
11:10 – 11:30	**Invited:** Vortex-induced vibration of a graphene origami-enabled metamaterial plate in laminar flow, **Yihe Zhang**
11:30 – 11:45	Stability analysis of annular perovskite plates based on opto-electro-thermo-mechano model, **Zhe Guo***
11:45 – 12:00	Finite element analysis of abnormal mechanical responses in a nonreciprocal gel, **Shoma Nonogaki***
12:00 – 12:15	Mode Shape and Binding Behavior of Oxygen Reduction Enzymes: A Molecular Dynamics and Finite Element Methods, **Taeyoung Yoon***
12:15 – 12:30	Origami-Inspired Lattice Structures Enhance Ductility of Cementitious Composites, **Yifan Zhao***

Session K2-2 (Room M9): Computational modelling in Porous Media (MS65 & MS58)

Chair: Yilin Gui

Time	Title/Authors
15:10 – 15:30	**Invited:** Desiccation cracking in reactive soils, **Yilin Gui**
15:30 – 15:45	Impact of Iron-Reducing Bacteria on Underground Hydrogen Storage Performance in the Otway Basin, **Yiqun Ma***
15:45– 16:00	Numerical modelling of microbially-induced calcium carbonate precipitation for crack-healing in concrete, **Yaolan Tang***
16:00 – 16:15	Analytical solutions for thermos-hydro-mechanical coupled problems in layered saturated porous media, **Gehan Chen***
16:15 – 16:30	Numerical Study on the Effect of Sample Dimensions on Bender Element Test Results, **Adel Ahmadinezhad***.
16:30 – 16:45	Two-dimensional Failure Envelopes of Conical Footings on Clay, **Hao Wang***

Session K2-3 (Room M9): Computational modelling in Porous Media (MS58) & Interfacial Phenomena and Multiphase flow (MS59)

Chair: Babak Shahbodagh & Zhongzheng Wang

Time	Title/Authors
17:00 – 17:20	**Invited:** Multiphase transport through a porous packed bed of solid electrolyte, **Travis Mitchell**
17:20 – 17:40	**Invited:** Modelling Cyclic Gas Injections in Heterogenous Porous Media. **Yixiang Gan**
17:40 – 17:55	Finite element analysis of wrinkle deformations in film–substrate bilayers induced by water droplets, **Reno Okamoto***
17:55 – 18:10	Modelling Capillary Interactions between Flexible Substrates, **Dongsheng Chen***
18:10 – 18:25	Shear Wave Propagation in Unsaturated Porous Media, **Babak Shahbodagh**
18:25 – 18:40	3D Numerical Simulation of Intermittent microwave-convective Drying (IMCD) using Dehumidified Air: Multi-sample configuration on food material, **Nileema Blanch Pereira***

Session M2-1 (Room M3): Emerging Fields in Computational Mechanics and Structural Optimization – A Mini-Symposium Honouring Professor Grant Steven's 80th Birthday (MS43)

Chair: Qing Li

Time	Title/Authors
10:50 – 11:05	Insights into impact damage and compression-after-impact strength of innovative composite architectures, **Distinguished Professor Brian Falzon**
11:05 – 11:20	Computational Optimisation of Heat Convective Structures, **Dehai Liu***
11:20 – 11:35	Topology Optimization for Multi-Component Robotic Arms under Time-Varying Loads, **Chi Wu**
11:35 – 11:50	Labyrinthine Near-Zero-Index Acoustic Metamaterials, **Jiahao Yin***
11:50 – 12:05	Phase-Field Modeling of Ductile Fracture: Insights from Solid and Shell Element Implementations, **Jianguang Fang**
12:05 – 12:20	Numerical Study on the Influence of Prestressing Levels in Post-Tensioned Flat Plate Slab-Column Joints with High-Strength Concrete, **Ziqi Zhao***

Session M2-2 (Room M3): Advanced Computational Design and Manufacturing for Materials and Structures (MS39)

Chair: Eric Li

Time	Title/Authors
15:10 – 15:30	**Invited:** Hybrid Torque Control Strategy with Gaussian Process Feedforward for a Novel MRF Dual-Clutch of an Electric Vehicle Transmission, **Lei Deng**
15:30 – 15:45	Electrodeposition Coating Simulation Based on Lab Experiments and Manufacturing Line Monitoring for Automotive Design, **Yuki Onishi**
15:45– 16:00	Computational Advances in Material Design, Simulation, and Additive Manufacturing, **Eric Li**
16:00 – 16:15	Innovative Design and Structural Performance Analysis of Topological Interlocking Bricks for Tubular Structures, **Maliheh Tavoosi Gazkoh***
16:15 – 16:30	Effective Finite Element Modelling of Composite Scarf Repairs, **Cam Minh Tri Tien**
16:30 – 16:45	Phase Transitions of Poly (vinylidene fluoride) under Coupled Electric-Strain Field, **Tianshu Liu***

Session M2-3 (Room M3): Advanced Computational Design and Manufacturing for Materials and Structures (MS39) & Vehicle-Bridge interactions (MS45 & MS47)

Chair: Judy P. Yang & Yeong Bin Yang

Time	Title/Authors
17:00 – 17:20	**Invited:** Multistable origamis inspired by avian feet, **Mohammad Mirkhalaf**
17:20 – 17:40	**Invited:** Development of Scaled Experimental Models for Vehicle-Scanning Method (VSM) in Bridge Monitoring, **Der-Shen Yang**
17:40 – 17:55	Topology Optimization of Nonlinear Structures for Stiffness–Vibration Duality Using Curve–Fitted Load Response Design, **Soma Tojo***
17:55 – 18:10	Using Instrumented Three-Mass Vehicle for Identifying Bridge Damping Ratio, **Judy Yang**
18:10– 18:25	Bridge and Rail Vibration Lab at Chongqing University, **Yeong Bin Yang**
18:25– 18:40	Contact point acceleration estimation via Bayesian filtering and smoothing, **Ho Man Siu***

Day 2: December 09, 2025, Tuesday

Session N2-1 (Room M4): Advanced Numerical Methods and Algorithms in Geomechanics (MS57)

Chair: Arman Khoshghalb & Giang D. Nguyen

Time	Title/Authors
10:50 – 11:10	**Invited:** Particle Infiltration Depth in Granular Filters: Observed Trends from CFD-DEM Simulations, **Adnan Sufian**
11:10 – 11:30	**Invited:** Effect of Packing Structure on SWRC in Silty Sands: A Discrete-Continuum Modelling Approach, **Nazanin Mahboobi Motlagh***
11:30 – 11:45	Investigation on the Pull-out Performance of Suction Anchors Considering Torsional and Trenching Effects: From Finite Element Analysis to Macroelement Model, **Min-Hao Zhang, Yong Fu**
11:45 – 12:00	Coupled MPM and level-set DEM and its application to modelling stone columns, **Ning Guo**
12:00 – 12:15	Periodic Lagrangian Analysis with Mesh Reconstruction: introducing a large deformation modelling approach in computational mechanics, **Ran Tu***
12:15 – 12:30	Filtration and clogging behaviour: a systematic definition on the pore network, **Marion Artigaut***

Session N2-2 (Room M4): Advanced Numerical Methods and Algorithms in Geomechanics (MS57)

Chair: Ha H. Bui & Ning Guo

Time	Title/Authors
15:10 – 15:30	**Invited:** An efficient and mesh-independent simulation framework for tunnel-induced rock failure based on the Scaled Boundary Finite Element Method, **Penghao Zhang**
15:30 – 15:50	**Invited:** An SPH-based RFT Framework for Rapid and Accurate Prediction of Spudcan Resistance, **Uyen Thi Hoang***
15:50 – 16:05	Research on Scour Repair and Dynamic Response of Monopiles Using Scour-Resistant Tough Solidified Soil, **Ting Huang**
16:05 – 16:20	A phase-field model for fault rupture and growth, **Jinhyun Choo**
16:20 – 16:35	Enhanced thermos-hydro-mechanical coupling for anisotropic geomaterials and its smoothed-FEM simulation, **Xianhan Wu***
16:35 – 16:50	A material point method approach to modelling cave propagation, **Pengyu Huang**

Session N2-3 (Room M4): Advanced Numerical Methods in Geomechanics (MS57) & PINNs for numerical modelling (MS04)

Chair: Jinhyun Choo

Time	Title/Authors
17:00 – 17:20	**Invited:** Using a strength criterion based on a cohesive frictional model to predict the onset of localisation, **Dharani Raj Subramaniam Viswanathan***
17:20 – 17:40	**Invited:** The numerical manifold method for Babuska's paradox, **Hong Zheng**
17:40 – 17:55	**Invited:** Theoretical Model for Predicting Jet Grouting Column Diameter, **Zhiwei Chen***
17:55 – 18:10	Combining distance field-based boundary condition enforcement and adaptive weight tuning for robust and stable inverse analysis using PINN, **Shota Deguchi***
18:10 – 18:25	Rate and Creep Effect on the Pull-out Performance of Suction Anchors in Clay, **Minhao Zhang***
18:25 – 18:40	Reinforcement learning for complex flows modelling, **Isa Helal***.

Day 3: December 10, 2025, Wednesday

Session A3-1 (Room PTR): Scientific Machine Learning Combined with Classical Methods (MS62)

Chair: Chang-Ock Lee

Time	Title/Authors
10:50 – 11:10	**Invited:** Learning a generalized multiscale prolongation operator, **Eric Chung**
11:10 – 11:30	**Invited:** Neural Network Tearing and Interconnecting Methods for a Poisson problem, **Hyea Hyun Kim**
11:30 – 11:45	A Neumann-Neumann Acceleration with Coarse Space for Domain Decomposition of Extreme Learning Machines, **Chang-Ock Lee**
11:45 – 12:00	Real-Time Solutions to PDEs with Neural Operators in Scientific Machine Learning, **Jaeyong Lee**
12:00 – 12:15	Integrating Classical Numerical Methods into Deep Operator Networks for Elliptic PDEs, **Dongwook Shin**
12:15 – 12:30	Learning Axial Green's Function via Neural Networks for Elliptic Problems with Variable Coefficients, **Junhong Jo**

Session A3-2 (Room PTR): Scientific Machine Learning Combined with Classical Methods (MS62) & (MS04)

Chair: Hyea Hyun Kim

Time	Title/Authors
15:20 – 15:35	Partitioned Neural Network Approximation for Partial Differential Equations with Enhanced Strategies, **Deok-Kyu Jang**
15:35 – 15:50	Physics-Informed Deep Inverse Operator Networks for solving PDE Inverse Problems**, Hwijae Son**
15:50 – 16:05	Underwater Acoustic Source Localization Based on Deep Learning, **Zhuoer Lin***
16:05 – 16:20	Initial Damage Prediction under Diverse Impact Conditions: The insights from Peridynamics surrogate artificial neural network, **Xiaohu Yu***
16:20 – 16:35	Impact of Activation Functions Across Differential Equations in (PINNs), **Peter Kurukulasuriya***
16:35 – 16:50	Stochastic PushForward and Multi-Scale Physics-Constrained Neural Networks for Efficient Long-term Forecasting of Complex Physical Systems, **Hao Zhou***

Session B3-1 (Room P1): Computational plasticity: theoretical development and its applications (MS25)

Chair: Li-Wei Liu

Time	Title/Authors
10:50 – 11:10	**Invited**: Algebraic Derivation of Consistent Tangent for Elastoplastic Problems in Finite Element Analysis, **Takeki Yamamoto**
11:10 – 11:30	**Invited**: Molecular dynamics simulation of the deformation of bicrystalline Al nanopillar under compression, **Takuya Uehara**
11:30 – 11:45	Regulating separate energy-dissipative mechanisms in constitutive modelling for quasi-brittle materials, **Nhan Nguyen***
11:45 – 12:00	Applications of return-free integration to yield surface detection of cellular materials, **Li-Wei Liu**
12:00 – 12:15	Super dislocation-precipitate interaction in Nickel-based superalloy by virtual dislocation core model, **Ko Nonoyama***
12:15 – 12:30	Elucidating the effect of off-angle on the contraction of basal plane dislocation in 4H-SiC, **Noboru Takahashi***
12:30 – 12:45	Dislocation dynamics analysis of size effects in alloys, **Hiroki Saito***

Session B3-2 (Room P1): Shape and Topology Optimization of Multiscale and Multimaterial Structures (MS63)

Chair: Hyun-Gyu Kim

Time	Title/Authors
15:20 – 15:40	**Invited**: Level-set Topology Optimization of Vibroacoustic Systems Considering Harmonic Stress Concentration, **Jaeyub Hyun**
15:40 – 15:55	Topology optimization of bi-material microstructures for achieving directional damping, **Zhan Kang**
15:55– 16:10	Homogenization-based Multiscale Topology Optimization for Heat Sinks with Functionally Graded Structures, **Yonghwa Ji***
16:10 – 16:25	Level-set Topology Optimization of Electrode Pattern for Multi-Focusing and Acoustic Holography, **Sanguk Park***
16:25 – 15:40	Multiscale shape and topology optimization using level set functions and trimmed meshes, **Hyun-Gyu Kim**
16:40 – 16:55	Dynamic analysis of the diaphragm's fracture in hypersonic impulse facilities, **Jiang Lai**

Day 3: December 10, 2025, Wednesday

Session C3-1 (Room P2): Crashworthiness of lightweight structures and materials (MS26)

Chair: Shanqing Xu

Time	Title/Authors
10:50 – 11:10	**Invited:** Performance evaluation of safety roller barriers made of recycled rubber, **Shanqing Xu**
11:10 – 11:30	**Invited:** Mechanical behaviour of 3D printed continuous fibre-reinforced composite gyroid structure under quasi-static and dynamic compression, **Dong Ruan**
11:30 – 11:45	Sustainable intralaminar-hybridised natural fibre-reinforced polymer composites – an experimental study for flexural properties under high loading rate, **Yuqi Wang***
11:45 – 12:00	Dynamic experimental study and design optimisation of steel safety rails and posts used in road safety barriers, **Vu Hoang Le***
12:00 – 12:15	Design of Temporary Defensive Structures for Managing Wind-related Disasters, **Jianhu Shen**
12:15 – 12:30	Analysis of impact resistance and Layer Optimization of Composite B-pillar Structure, **Mengdi Li***

Session C3-2 (Room P2): Crashworthiness of lightweight structures and materials (MS26)

Chair: Dong Ruan

Time	Title/Authors
15:20 – 15:40	**Invited:** An energy equivalent flow stress theory for plastic bending of fully clamped beams, **Xiong Zhang**
15:40 – 16:00	**Invited:** Large deformation behavior of lattice structure in compression, **Jianjun Zhang***
16:00– 16:15	Robust Topology Design of Negative Poisson's Ratio Metamaterials Considering Material Randomness, **Qihan Wang**
16:15 – 16:30	Finite Element Modelling for Additively Manufactured Metal Microlattice Structures Under Low-Velocity Impact, **Mohammad Ramadneh***
16:30 – 16:45	Effect of the Density Gradient on the Mechanical Behaviour of an Architectured Material Under Dynamic Loading, **Manish Kumar***
16:45 – 17:00	Operational Safety Assessment of High-Speed Trains in Canyon Wind Environments, **Dilong Guo**

Session D3-1 (Room P3): Computational Fluid Dynamics of Flow and Heat Transfer in Complex Structures (MS52)

Chair: Bingchuan Nie

Time	Title/Authors
10:50 – 11:05	High Performance Cooling Solution for IGBT Power Modules via Graphite TIM and Two-layered Micro-Channel Heat Sink, **Bijan Darbari***
11:05 – 11:20	Particle-laden natural convection adjacent to vertical thermal wall, **Bingchuan Nie**
11:20 – 11:35	Numerical Simulation of Heat Transfer in Lattice Structure for Heat Sink Application, **Ebelechukwu Okeke***
11:35 – 11:50	CFD-Based Analysis of Porosity Effects on Transport Phenomena and Hydrogen Production in PEM Electrolysers, **Ali Bayat***
11:50 – 12:05	Breathing Cold Air: A Large Eddy Simulation Numerical Study in a CT-based Respiratory Tract, **Xinlei Huang***
12:05 – 12:20	Numerical analysis on the thermal performance of circular and elliptical micro-pin-fin heat sinks with same perimeter, **Jer-Huan Jang**

Session D3-2 (Room P3): Computational Fluid Dynamics of Flow and Heat Transfer in Complex Structures (MS52)

Chair: Bingchuan Nie

Time	Title/Authors
15:20 – 15:35	Numerical Evaluation of Fire Suppression in Compartment Fires, **Ifthaz Hameed Savul Hameed***
15:35 – 15:50	Heat Transfer in Energy-Efficient, Fire-Rated wall systems for Australian Construction: A numerical study, **Saranya Ilango***
15:50– 16:05	A GPU Accelerated Multiphysics Solver based on Operator-splitting Galerkin Finite Element Method, Yunpeng Zhang, **Michael Elford, Storm Collis**
16:05 – 16:20	Numerical investigation of thermal transport in viscoelastic fluids using the Lattice Boltzmann method, **Alireza Khoshnood***
16:20 – 16:35	Pore-Scale Investigation of Wettability-Controlled Capillary Barrier Effects under Gravity, **Haiyi Zhong***

Day 3: December 10, 2025, Wednesday

Session E3-1 (Room P4): Advances in Phase-field Modeling and its Integration with Experiments (MS35)

Chair: Akinori Yamanaka

Time	Title/Authors
10:50 – 11:05	Preliminary investigation of a multi-phase-field simulation method for semi-solid deformation introducing gas-liquid two-phase flow, **Tomoki Uchiyama***
11:05 – 11:20	Bayesian data assimilation framework for accurate phase-field simulation of Ostwald ripening, **Eisuke Miyoshi**
11:20 – 11:35	Data assimilation using phase-field simulation to estimate polycrystalline equiaxed dendritic structures, **Shunsuke Kanki***
11:35 – 11:50	Parameter estimation of a multi-phase field model for austenite-to-ferrite transformation in steel based on Bayesian inference, **Taiki Suzuki***
11:50 – 12:05	A large-scale phase-field LBM of the sedimentation of multiple equiaxed dendrites, **Takumi Yoneda***
12:05 – 12:20	Three-dimensional phase-field simulation for banded microstructure formation during rapid solidification, **Shinnosuke Tahara***

Session E3-2 (Room P4): Advances in Phase-field Modeling and its Integration with Experiments (MS35)

Chair: Eisuke Miyoshi

Time	Title/Authors
15:20 – 15:35	Estimation of stored energy distribution using hybrid data assimilation and in-situ observation of static recrystallization in aluminum alloy, **Motoki Umezawa***
15:35 – 15:50	Investigation of Phase-field Data Assimilation for Obtaining Computational and Material Parameters from Limited Experimental Data, **Aya Maruhashi***
15:50– 16:05	Optimization Framework for Sintering Conditions Combining Phase-field Simulation and Bayesian Optimization, **Akimitsu Ishii**
16:05 – 16:20	Prediction of Material Properties from Cross-sectional Dendritic Microstructure Images via Machine Learning Trained on Systematic Phase-field Simulations, **Tomohiro Takaki**
16:20 – 16:35	Numerical Modelling of Fracture Propagation of Hot Dry Rock with the Acid Fracturing Fluids, **Weijun Shen**

Session F3-1 (Room P5): Computational Biomechanics and Biomimetics in Flying and Swimming (MS44)

Chair: Daisuke Ishihara

Time	Title/Authors
10:50 – 11:10	**Invited:** Data-driven formulation of quasi-steady aerodynamic model of flapping wings, **Yu Kamimizu***
11:10 – 11:30	**Invited:** Computational fluid-structure-control interaction analysis for insect flight maneuverability, **Kaede Sugikawa***
11:30 – 11:45	Development of polymer micromachined insect-mimetic wings using fluid-structure interaction analysis, **Daisuke Ishihara**
11:45 – 12:00	B-spline Based Superimposing-Version of Finite Element Method for Fluid Boundary Value Problems with Nitsche's Method, **Nozomi Magome***
12:00 – 12:15	Aerodynamic performance of the wing with slotted wing tip, **Yosuke Yamamoto***
12:15 – 12:30	An improved Immersed Boundary Method for studying fish-like locomotion, **Yiyang Jiang***

Session F3-2 (Room P5): Computational Biomechanics and Biomimetics in Flying and Swimming (MS44)

Chair: Fangbao Tian

Time	Title/Authors
15:20 – 15:40	**Invited:** Remeshing Strategy for ALE-based FSI analysis to deal with large structural displacement, **Shigeki Kaneko***
15:40 – 16:00	**Invited:** Bio-Inspired Flight for Martian Exploration, **Nathan Widdup***
16:00– 16:15	AI-enhanced fluid-structure interaction analysis of turbine blades, **Longyan Wang**
16:15 – 16:30	Lift enhancement of a butterfly-inspired flapping wing by tip-vortex capture and streamwise ram effect, **Yixin Chen***
16:30 – 16:45	Simulation of the Hydrodynamics of Flapping Wings under High Reynolds Numbers using the Immersed Boundary Method, **Bo Yin**

Day 3: December 10, 2025, Wednesday

Session G3-1 (Room M1): Multiscale Computational and Data-Driven Approach of Advanced Materials and Structures (MS40)

Chair: Jaehun Lee

Time	Title/Authors
10:50 – 11:05	Development of a 1D ROM for optimal design of deck plates considering welding depth, **Myungil Kim**
11:05 – 11:20	Parameterization and coarse-grained molecular dynamics simulations on mechanical behaviour of semi-crystalline polymer, **YoungJune Ryu***
11:20 – 11:35	Surrogate modelling of nonreciprocal mechanical behavior reflecting microscopic tension-compression asymmetry, **Yuto Inamae***
11:35 – 11:50	Ab-initio and molecular dynamics simulation study on BN-based piezoelectric nanostructures, **Jaewon Lee***
11:50 – 12:05	A combined MCNP and molecular dynamics simulation study on radiation degradation of epoxy resins in nuclear power plant, **Jiung Han***
12:05 – 12:20	Mechanochemical influence of vibrations on electrode interfaces in lithium-based batteries, **Taeksoo Jung*, Byeongyong Lee***

Session G3-2 (Room M1): Multiscale Computational and Data-Driven Approach of Advanced Materials and Structures (MS40 & MS56)

Chair: Jaehun Lee & Yuqi Feng

Time	Title/Authors
15:20 – 15:40	**Invited:** Deep learning framework for accelerating the data-driven multiscale finite element analysis, **Hyunseong Shin**
15:40 – 16:00	**Invited:** A physics-based reduced-order modelling combined with the localization of microscopic problems for efficient nonlinear FE2 multiscale analyses, **Jaehun Lee, Yujin So**
16:00– 16:15	Contact Modelling and Optimization of Contact Pressure in Joining of Thermoplastic Composite Novel Joint, **Wanrapee Wannawitayapa***
16:15 – 16:30	Atomic reconstruction and interfacial mechanics at the confined solid-liquid interface, **Chun Tang**
16:30 – 16:45	AI-Accelerated Reactive Molecular Dynamics Simulation for Optimizing Epoxy Crosslinking in Fibre Reinforced Polymers, **Xingyu Zhao***.
16:45 – 17:00	Functionalization of wood composites using two-dimensional layered double hydroxides: An atomistic approach, **Yuqi Feng***.

Session H3-1 (Room M2): Multiscale Modelling and Artificial Intelligence for Computational Materials Design (MS41)

Chair: Shu-Wei Chang

Time	Title/Authors
10:50 – 11:10	**Invited:** Molecular modelling of gellan gum in bioengineering applications, **Chia-Ching Chou**
11:10 – 11:30	**Invited:** Optimization of a thermal flow surrogate model for liquid cooling systems based on machine learning, **Chang-Wei Huang**
11:30 – 11:45	The Investigation on coherent transport in graphene phononic crystal, **I-Ling Chang**
11:45 – 12:00	Mechanistic investigation of KtrAB channel regulation via molecular dynamics, **Pei-Cheng Li***
12:00 – 12:15	From informed optimization to generative intelligence: designing the next frontier of 3D architected materials, **Seunghwa Ryu**
12:15 – 12:30	Multi-fidelity surrogate for mechanical properties of short fiber reinforced plastics: leveraging information from theory to experiment, **Hugon Lee***

Session H3-2 (Room M2): Multiscale Modelling and Artificial Intelligence for Computational Materials Design (MS41 & MS15)

Chair: Shu-Wie Chang & Tianju Xue

Time	Title/Authors
15:20 – 15:35	Artificial Intelligence-Assisted Geometric Compensation and Finite Element Optimization for Patient-Specific Dental Implant Design, **Li Jun Lai***.
15:35 – 15:50	Molecular dynamics investigation of splicing interfaces between YAG and silica at various temperatures, **Chiang-Hsin Lin***.
15:50– 16:05	Neural Network-Based Constitutive Model for Porous Solid Materials, **Reem Alhayki***.
16:05 – 16:20	Differentiable Material Point Method for 3D Concrete Printing, **Wenchang Zhang***.
16:20 – 16:35	Numerically Stable Evaluation and Automatic Differentiation of Closed-Form Expressions for Eigenvalues of 3×3 Matrices, **Andreas Zilian**.
16:35 – 16:50	A High-Performance AI-Driven Analytics Pipeline for Mapping Inequality in Legislative and Social Media Data, **Alex ZheHan Gu**

Day 3: December 10, 2025, Wednesday

Session I3-1 (Room M5&6): Computational Particle Dynamics (MS18)

Chair: Dianlei Feng

Time	Title/Authors
10:50 – 11:10	**Invited:** A Density Smoothing B-Spline Material Point Method for Fluid-Structure Interaction Problems, **Zheng Sun**
11:10 – 11:30	**Invited:** Laminar Vortex Dynamics in Pore-Scale MICP: A 3D LBM-FE-CA Numerical Model Analysis, **Dianlei Feng**
11:30 – 11:45	Influence of Particle Morphology on Segregation Rate in Vertically Vibrated Granular Beds, **Yingjie Gu***
11:45 – 12:00	An Efficient Surrogate Model Construction for Large-Scale Fluid Simulations Based on Dimensionality Reduction and FFX Method, **You Zhou***
12:00 – 12:15	A Multi-scale CFD-DEM approach for particulate flows, **Xuanting Liu***

Session I3-2 (Room M5&6): Computational Particle Dynamics (MS18) & Linear and Nonlinear Ocean Waves Dynamics (MS34)

Chair: Xudan Luo

Time	Title/Authors
15:20 – 15:40	**Invited:** Development on B-spline MPM-SPH coupling algorithm for fluid-solid coupling problems, **Lisha He**
15:40 – 15:55	Multi-level Numerical Simulation of 3D Concrete Printing: from Filaments to Structures, **Dong An***
15:55– 16:10	Obliquely interacting solitary waves and wave wakes in free-surface flows, **Xudan Luo**
16:10 – 16:25	Quasi-potential model for nonlinear wind-induced water waves, **Enwei Zhang**
16:25 – 16:40	Strongly nonlinear Long-crested Rogue Wave within Monochromatic and Bichromatic Wave Systems, **Yuchen He***
16:40 – 16:55	Analysis of floating platform-mooring system-pile-soil interactions under extreme wave loadings by using MPM-FEM approach, **Bisheng Wu**

Session J3-1 (Room M7&8): Advances in Numerical Computation of Complex Fluid Flows in Industrial Application (MS61)

Chair: Jaewook Nam

Time	Title/Authors
10:50 – 11:10	**Inivited:** Modeling, Simulation, and Optimization in Plastics Profile Extrusion, **Stefanie Elgeti**.
11:10 – 11:30	**Inivited:** Well-entangled polymer melts flow simulations using multiscale simulation method and machine-learned constitutive relation, **Takashi Taniguchi**
11:30 – 11:45	Mixing Thixotropic Fluids with Yield Stress in a Static Mixer, **Tae Gon Kang**
11:45 – 10:00	Influence of Mesh as a Virtual Elastic Material in Free Surface Flow Computation, **Yundong Yang***
12:00 – 12:15	Shape Analysis on Coating Layer Edge Profiles, **Jisoo Song***
12:15 – 12:30	Computational Design Assessment of Innovative Static Mixers for Gas-Liquid Flow Applications, **Efaf Zahra Mahdizadeh Gohari***

Session J3-2 (Room M7&8): Advances in Numerical Computation of Complex Fluid Flows in Industrial Application (MS61) & Computational Biomechanics (MS20)

Chair: Kwong Ming Tse

Time	Title/Authors
15:20 – 15:40	**Inivited:** Advanced phase field modeling of rising bubble dynamics in viscoelastic-newtonian multiphase flows, **Jaewook Nam***
15:40 – 15:55	A Diffuse-Interface Method for Modeling Two-Phase Flow with a Boussinesq-Scriven Interface, **Jang Min Park**
15:55– 16:10	Scientific machine learning and uncertainty quantification for aortic hemodynamics and wall mechanics, **Sascha Ranftl**
16:10 – 16:25	Exploration of the application of physics to inform machine learning to drive structural optimisation in the biomedical space, **Bary Clark***
16:25 – 16:40	Machine-learning facilitated development of silk-based materials for applications of on-skin devices, **Jiahao Qin***

Day 3: December 10, 2025, Wednesday

Session K3-1 (Room M9): Simulations of Structural Responses under Extreme Conditions (MS54)

Chair: Jiarui Wang

Time	Title/Authors
10:50 – 11:10	**Invited**: Meshfree method for large deformation analysis without any domain remesh- a nonlinear scheme based on stabilized collocation method, **Lihua Wang**
11:10 – 11:25	Heated spalling and damage of rock caverns under extreme fire temperatures using the phase field method, **Zhaonan Wang**
11:25 – 11:40	Damage and repair assessment of transmission tower under different seasonal loads and support movement: Discussion of member damages and ultimate strength recovery, **Yuto Yamano***
11:40 – 11:55	Immersed-Boundary Meshfree Methods with Consistent Weight-Learning Numerical Integration, **Dongdong Wang**
11:55 – 12:10	A general-purpose meshfree Kirchhoff-Love shell formulation, **Jiarui Wang**
12:10 – 12:25	Efficient Topology Optimization with CutFEM and Moving Morphable Component Method for Complex Geometries and Boundary Conditions, **Zhiqiang Guan***

Session K3-2 (Room M9): Simulations of Structural Responses under Extreme Conditions (MS54 & MS24)

Chair: Jiarui Wang

Time	Title/Authors
15:20 – 15:40	**Invited**: An Efficient Analysis Method for Interlocking Bricks Using Representative Volume Element, **Xihong Zhang**.
15:40 – 15:55	Edge-Dislocation Behaviour under Wide Range of Hydrogen Concentrations and Mechanical Conditions: DFT, MD and Theoretical Analyses, **Ryosuke Matsumoto**.
15:55– 16:10	Atomic Study of the Vacancy Absorption near Grain Boundary in the Presence of Hydrogen in Alpha Iron, **Shinya Taketomi**.
16:10 – 16:25	Hydrogen absorption in Fe-Cr-Ni austenitic systems: Effect of major elements (Cr, Ni), **Osamu Takakuwa**.

Mini-symposium List

I. Artificial Intelligence and Machine Learning in Mechanics

MS01: Machine Learning in Computational Mechanics. Fangfang Xie, Yanping Lian, Bin Ding
MS02: Modelling, Simulation, and AI for NDT and SHM. Fangsen Cui, Jing Xiao, Menglong Liu, Gongfa Chen
MS03: Scientific AI: Physics-informed Machine Learning, Topology Optimization, and Industrial Applications. Jae Hyuk Lim, Seungchul Lee, Jaewook Lee, Jinshuai Bai, Hyogu Jeong, YuanTong Gu
MS04: Physics-enhanced AI techniques for numerical modelling and computation. Jinshuai Bai, Yizheng Wang, Yinghua Liu, Xi-Qiao Feng
MS05: Advanced machine learning methods for multiscale and materials modeling. Tung-Huan (Michael) Su, Chuin-Shan (David) Chen, Chun-Wei Pao, C. T. Wu
MS06: Kernel and machine learning-based solutions of PDEs. Xiaoying Zhuang, Zhuojia Fu, Elena Atroshchenko, Timon Rabczuk
MS07: Deep and machine learning methodology in the context of application to computational mechanics. Yoshitaka Wada, Yasushi Nakabayashi, Masao Ogino, Akio Miyoshi, Shinobu Yoshimura

II. Digital Twins and Health Monitoring

MS08: Recent computational mechanics for digital twins: artificial intelligence and computational methods. Haeseong Cho, SangJoon Shin
MS09: Digital Twin and Artificial Intelligence for Prognostics and Health Management. Heung Soo Kim, Chang-Wan Kim, Jung Woo Sohn, Jang-Woo Han, Janghyuk Moon
MS10: Computational Modelling of Life Cycle Performance of Infrastructure Assets for Net Zero. Lihai Zhang, Dr Shuangmin Shi
MS11: Advancing Data-Driven Approaches and Reduced-Order Modelling in Structural Mechanics. Wei-Tze Chang, Shieh-Kung Huang

III. Numerical Methods and Computational Approaches

MS12: Advance and Application of Meshfree Methods. Kuan-Chung Lin, Judy P. Yang, Chia-Ming Fan, Pai-Chen Guan, Tsung-Hui Huang, Kuan-Chung Lin, Ming-Jyun Dai
MS13: Mesh-free and Mesh-less method. Mitsuteru Asai, Abbas Khayyer, Pengnan Sun, Masahiro Kondo, Takuya Matsunaga
MS14: Advances and applications of scaled boundary finite element methods. Shouyan Jiang, Ean Tat Ooi, Denghong Chen, Jianbo Li, Junqi Zhang, Carolin Birk, Chengbin Du, Chongmin Song
MS15: Advances in Automatic Differentiation Techniques for Computational Mechanics. Tianju Xue, Chuanqi Liu, Sheng Mao and Yue Mei
MS16: Ritter-Križaić iteracion method of flat truss constructions. Vladimir Križaić
MS17: Numerical Methods for Contact, Damage, and Fracture Mechanics. Yan Li, Pihua Wen, Zhiqiang Feng
MS18: Computational Particle Dynamics. Dianlei Feng, Hantao Liu, Moubin Liu

MS19: Novel Numerical Methods and Multi-Approach Strategies in Computational Mechanics. Naoto Mitsume, Koji Nishiguchi, Shunhua Chen, Tetsuya Matsuda, Mitsuteru Asai, Tomohiro Sawada
MS20: Computational Biomechanics. Kwong Ming (KM) Tse, Chi Wu, Raj Das

IV. Materials and Structures

MS21: Recent advances in Nanocomposite Structures. Yingyan Zhang, Henin Zhang, Shaoyu Zhao, Jie Yang
MS22: Numerical modelling and computational methods of bio-inspired metamaterials. Fengxiang Xu, Chang Qi
MS23: Vibroacoustics of metamaterials. Heow Pueh LEE, Kian Meng Lim, Linus ANG
MS24: Multiscale Modeling of Defect Evolution in Metallic Materials under Extreme Environment. Jun Song, Fei Xu, Cheng Chen, Jie Hou and Xiao Zhou
MS25: Computational plasticity: theoretical development and its applications. Li-Wei Liu
MS26: Crashworthiness of lightweight structures and materials. Shanqing Xu, Jianhu Shen, Azman Yahaya, Dong Ruan
MS27: Computational Design for Biomanufacturing and Advanced Structures. Zhongpu (Leo) Zhang, Yunlong Tang, Ali Entezari

V. Fluid Dynamics and FSI

MS28: Numerical Methods for Fluid-Structure Interaction Problems and Complex Flows. FANG-BAO TIAN, Shibo Kuang
MS29: Computational Fluid Dynamics (CFD) and Fluid-structure Interaction (FSI): Method Development and Applications. Jinhui Yan, Tsung-Hui Huang, Chao-An Lin
MS30: Computational fluid dynamics simulation: flow prediction and application. Koji Fukudome, Hiroya Mamori, Yusuke Kuwata
MS31: CFD-DEM of Multiphase Flow: Modelling and Applications. Mohammad Saidul Islam, Shibo Kuang; Emilie Sauret; YuanTong Gu
MS32: CFD, FSI, and multiphysics simulation in biomedical engineering. Xinying Liu
MS33: Modern Computational Techniques in Wind Engineering. Yuan-Lung Lo, Matthew S. Mason
MS34: Linear and nonlinear ocean waves dynamics. Zhen Wang, Zhan Wang

VI. Phase Field and Fracture Mechanics

MS35: Advances in Phase-field Modeling and its Integration with Experiments. Akinori Yamanaka, Eisuke Miyoshi, Shinji Sakane, Akimitsu Ishii, Tomohiro Takaki
MS36: Phase field model of fracture. Jianguang Fang, Yongxing Shen, Tiantang Yu
MS37: Recent advances in computational fracture mechanics and failure analysis. Yoshitaka Wada, Hiroshi Okada, Toshio Nagashima, Xiaosheng Gao, Ayhan Ince, Adrian Loghin

VII. Optimisation and Design

MS38: New trends in computational optimization design and its applications. Chi Wu, Takayuki Yamada, Xueguan Song, Xiaodong Huang, Qing Li

MS39: Pioneering Innovation in Materials and Structures Through Advanced Computational Design, Experimentation, and Manufacturing. Eric Li, Lifeng Wang, Xu Xu, Zhuoqun Zheng, Aihong Zou
MS40: Multiscale Computational and Data-Driven Approach of Advanced Materials and Structures. Jaehun Lee, Hyunseong Shin, Seunghwa Yang, Wylie Stroberg, Maenghyo Cho
MS41: Multiscale Modelling and Artificial Intelligence for Computational Materials Design. Shu-Wei Chang, Seunghwa Ryu, Chia-Ching Chou, Li-Wei Liu, I-Ling Chang
MS42: Shape and Topology Optimization for Industrial Applications. Takayuki Yamada, Gil Ho Yoon, Shun Ogawa
MS43: Emerging Fields in Computational Mechanics and Structural Optimization – A Mini-Symposium Honouring Professor Grant Steven's 80th Birthday. Qing Li

VIII. Specialized Applications

MS44: Computational Biomechanics and Biomimetics in Flying and Swimming. Daisuke Ishihara, Fangbao Tian, Hao Liu
MS45: Vehicle-Bridge Interaction and Its Applications. Judy P. Yang, D.S. Yang, J.D. Yau
MS46: Image-based modelling in Computational Medicine. Shaolie Hossain, Jessica Zhang
MS47: Vehicle Scanning Method for Bridges. Y.B. Yang, Z.L. Wang, K. Shi, H. Xu
MS48: Numerical and Learning Techniques for Organ-Level Modeling. Feng-Nan Hwang
MS49: Computational Nanomechanics and Nanoscale Thermal Transport. Haifei Zhan

IX. Energy and Thermal Systems

M50: Quantum Scientific Computing in Engineering. Mayu Muramatsu, Kenjiro Terada, Yan Wang, Marek Behr
MS51: Advances in Thermal Management and Energy Storage: Innovations in Hydrogen and Sustainable Applications. Saidul Islam, Mohammad S. Islam, and Nick S. Bennett
MS52: Computational Fluid Dynamics of Flow and Heat Transfer in Complex Structures. Wenxian Lin

X. Geosciences and Environmental Applications

MS53: Computational Geosciences. Chun'an Tang, Bin Gong
MS54: Model-Based Simulations of Structural Responses under Extreme Conditions. Dongdong Wang, Xiong Zhang, Moubin Liu, Fei Xu, Lihua Wang, Zhen Chen
MS55: Mathematical Modelling and Simulation for Social, Environmental, and Disaster Prevention Issues. **Eisuke Kita**, Shinobu Yoshimura, Daigoro Isobe, Hideki Fujii and Eisuke Kita
MS56: Data-Driven Advances in Multiscale Modeling for Sustainable Construction Materials. Xing Quan Wang, Xiaohong Zhu
MS57: Advanced Numerical Methods and Algorithms in Geomechanics. Yinghui Tian, Arman Khoshghalb, Ha Hong Bui, Majid Nazem, Giang D. Nguyen, Annan Zhou, Lulu Zhang
MS58: Recent Computational Advances in Dynamics of Porous Media. Babak Shahbodagh, Arman Khoshghalb, Nasser Khalili

XI. General Topics Related to Computational Mechanics

MS59: Interfacial Phenomena and Multiphase flow. Zhongzheng Wang

MS60: Emerging Trends in Fast and Large-Scale Computational Mechanics. SangJoon Shin, Jung-Wuk Hong, Seongim Choi, Jin-Gyun Kim, Haeseong Cho
MS61: Recent Advances in Numerical Analysis and Computation of Complex Fluid Flows in Industrial Application. Jaewook Nam, Wook Ryol Hwang, Tae Gon Kang
MS62: Scientific Machine Learning Combined with Classical Methods. Chang-Ock Lee, Hyea Hyun Kim
MS63: Shape and Topology Optimization of Multiscale and Multimaterial Structures. Hyun-Gyu Kim, Jaewook Lee
MS64: Data-driven Approaches for Analysis, Design, and Applications. Ikjin Lee, Seunghwa Ryu, Yoojeong Noh
MS65: Multiphase Multiphysics coupling in Porous Media. Yilin Gui, Miao Yu
MS66: Advances in Computational Methods in Infrastructure Systems and Engineering. Tong-Seok Han, Kyoungsoo Park, Sang-Yeop Chung
MS67: Advances in BIE/BEM. Yijun Liu, Xiaowei Gao, Haibo Chen, Yang Yang, Leilei Chen
MS68: General Topics Related to Computational Mechanics.

Conference Hosts

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