The 12th International Conference on Fracture Fatigue and Wear (FFW 2024)

&

The 7th International Conference on Numerical Modelling in Engineering (NME 2024)

Conferences Programme

Venue: physically (Ramada Bell Tower Hotel Xi'an) and online (MS Teams)

Address: Ramada Bell Tower Hotel Xi'an, No.79 North Street, Xincheng District, Xi'an, Shaanxi, 710003, China

For online: to join the conference sessions, please click on the following link:

Click here to join the meeting

All presentations are scheduled in China Standard Time

The 12th International Conference on Fracture Fatigue and Wear (FFW 2024)
July 28-31, 2024

Chairman

Prof. Magd Abdel Wahab
Ghent University, Belgium

Co-Chairman

Prof. Yun-Lai Zhou
Xi'an Jiaotong University, China

International Scientific Committee

Prof. S Abdullah, Universiti Kebangsaan Malaysia, Malaysia
Dr. J Abenojar, Universidad Carlos III de Madrid, Spain
Prof. J Toribio, University of Salamanca, Spain
Dr. A Rudawska, Lublin University of Technology, Poland
Dr. K Masuda, University of Toyama, Japan
Prof. K Oda, Oita University, Japan
Dr. Dagang Wang, China University of Mining and Technology, China
Prof. Hung Nguyen-Xuan, HUTECH, Vietnam
Prof. Timon Rabczuk, Bauhaus University Weimar, Germany
Prof. X. Zhuang, Leibniz Unversität Hannover, Germany
Dr. C Le Thanh, Open University Ho Chi Minh City, Vietnam
Dr. Y.L. Zhou to Xi'an Jiaotong University, China
Dr. Qi Zhao, Hubei University of Automotive Technology, China
Prof. Lihua Wang, Tongji University, Shanghai, China
Prof. Mojtaba Ayatollahi, University of Zanjan, Iran
Dr. Hoang Le Minh, Open University Ho Chi Minh City, Vietnam
Dr. Anagnostis Toulfatzis, ELKEME Hellenic Research Centre for Metals S.A., Greece
Prof. Magdalena Niemczewska-Wójcik, Cracow University of Technology, Poland
Dr. Raul Campilho, Instituto Superior de Engenharia do Porto, Portugal
Prof. Yusuf Şahin, OSTIM Technical University, Turkey
Dr. Hafiz T Ali, Taif University, KSA
Dr. Dhanraj Rajaraman, Ghent University, Belgium

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Prof. L. Vanegas Useche, Universidad Tecnológica de Pereira, Colombia
Prof. Hung Nguyen-Xuan, HUTECH, Vietnam
Prof. Timon Rabczuk, Bauhaus University Weimar, Germany
Prof. Xiaoying Zhuang, Leibniz Unversität Hannover, Germany
Dr. C Le Thanh, Open University Ho Chi Minh City, Vietnam
Dr. Y.L. Zhou to Xi'an Jiaotong University, China
Prof. Lihua Wang, Tongji University, Shanghai, China
Dr. Qi Zhao, Hubei University of Automotive Technology, China
Dr. Yong Ling, Ghent University, Belgium
Prof. Mojtaba Ayatollahi, University of Zanjan, Iran
Dr. Ho Viet Long, University of Transport and Communications, Vietnam
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Dr. Desmond Adair, Nazarbayev University, Republic of Kazakhstan
Dr. Cristhian Mendoza, National University Of Colombia
Dr. Carlos Frajuca, Rio Grande Federal University, Brazil
Dr Hafiz T Ali, Taif University, KSA
Professor Raul Duarte Salgueiral Gomes Campilho, Instituto Superior de Engenharia do Porto, Portugal
Assoc. Prof. Ángel A. San-Blas, Miguel Hernandez University of Elche, Spain

KEYNOTE LECTURE 1

Monday 29 July 2024
Time: 10:10 am to 11:00 am
Keynote speaker: Professor Jeng-Tzong Chen
Affiliation: Department of Harbor and River Engineering, National Taiwan Ocean University, Keelung 20224, Taiwan, China
Title: Recent development on the double-degeneracy mechanism of the BEM/BIEM

Abstract: BEM is an acceptable approach for simulating engineering problems. It is well known that four degenerate problems, degenerate scale, spurious eigenvalue, fictitious frequency and degenerate boundary, may occur by using the BEM/BIEM. However, only the degenerate scale and degenerate boundary may appear at the same time. This is so-called double degeneracy. Degenerate kernel is the key mathematical tool to understand the occurring mechanism. Objectivity of the degenerate kernel is examined. In this talk, the degenerate kernel is employed to analytically explain how the degenerate mechanism appears in the boundary integral formulation. It is found that only rigid line inclusion instead of a crack may have the possibility of double degeneracy on the same geometry. Even though the boundary density is polluted by the null space, the field solution may be correct. Not only the analytical derivation is proposed but also the numerical experiment is also performed. Anti-plane shear and two-dimensional elasticity problems are both addressed. Three possibilities to appear double degeneracy degeneracy are also shown.

Biographical Sketch: Jeng-Tzong Chen, born in 1962, received a BS degree in Civil Engineering, an M.S. in Applied Mechanics, and a Ph.D. in Civil Engineering, respectively, in 1984, 1986 and 1994, from National Taiwan University, Taipei, Taiwan, R.O.C. He worked as a research assistant in the Structural Division of the Department of Rocket and Missile System, Chung Shan Institute of Science and Technology, from 1986 to 1990. In 1994, he was invited to be an Associate Professor in the Department of Harbor and River Engineering, National Taiwan Ocean University, Keelung, Taiwan, R.O.C. He was promoted to a full professor in 1998. Later in 2004, he was selected to be the Distinguished Professor. In 2007, he was selected as the Lifetime Distinguished Professor. He is also the Professor of the Department of Mechanical and Mechatronic Engineering of Taiwan Ocean University. In 2011, he won the MOE academic award and the ICACM Fellow Award. In 2023, he won the highest academic award of STAM, Sun F D medal. His major interest is computational mechanics. He had derived the theory of dual integral equations for boundary value problems with degenerate boundary. Prof. Chen also developed five dual BEM programs for the BVPs of Laplace equation, Helmholtz equation, bi-Helmholtz and modified Helmhotlz equation and Navier equation. Recently, he also employed the null field integral equations to solve BVPs with circular and/or elliptical boundaries including holes and inclusions. Besides, he focused on the non-uniqueness solution of integral equations in recent years. He wrote two books in Chinese on the dual BEM and the FEM using MSC/NASTRAN, respectively. He was ever invited to give plenary and keynote lectures, e.g., twice in World Congress on Computational Mechanics (WCCM4 (1998) in Buenos Aries and WCCM5 (2002) in Vienna), four times in ICOME 2006(Nanjing), 2009(Hefei), 2012(Kyoto) and 2015(Hangzhou), FEM/BEM 2003 in St. Petersburg, Russia, ICCES 2005 in Chennai, ICIP 2010 in Hong Kong, ACMFMS 2012 in Delhi, APCOM&ISCM III (2013) in Singapore and ICF 2013 in Beijing, BEM/MRM 36 (2014) in Dalian and IABEM 2014(Zhengzhou). In 2012, he was invited to deliver a plenary talk in ACMFMS (New Delhi, India). In 2018, he delivered plenary lectures in China twice, IWMM and cross strait meeting. In 2019, he delivered a semi-plenary talk in APCOM 2019 at Taipei. In 2016, 2019, 2021 and 2022, he was invited a plenary talk in ICCMS conferences in India. In addition, he is now the associate editor of Journal of Mechanics (JOM), Journal of Chinese Institute of Engineers (JCIE), and Engineering Analysis with Boundary Elements (EABE). Besides, he has been the associate editor of the editor of Journal of Marine Science and Technology. He won three times of Outstanding Research Awards from the National Science Council, Taiwan. He also won the first Wu, Ta-You Memorial Award in 2002. He is currently a member of the editorial board of many international SCI journals. Until now, he has published more than 247 SCI journal papers on the BEM and the FEM in technical Journals. More than 5000 citations from 2564 papers are found to cite Chen's work. Two papers (ASME-AMR and ASCE-EMD) were both cited more than 483 and 432 times from Google, respectively. Boundary element method is one focus of Professor Chen's research interests. Others may be categorized into two areas. One is vibration and acoustics, and the other is computational mechanics. In 2017, he was selected as the Fellow of STAM, R O C. In 2018, he was selected to be the first Distinguished Chair Professor in NTOU. In 2022, he is now a guest professor at National Taiwan University, an adjunct professor of National Cheng Kung University and Distinguished Chair Professor of National Taiwan Ocean University.

KEYNOTE LECTURE 2

Monday 29 July 2024
Time: 2:00 pm to 2:50 pm
Keynote speaker: Professor Nao-Aki Noda
Affiliation: Kyushu Institute of Technology, Mechanical Engineering Department, Kitakyushu 804-8550, Japan
Title: Study on sleeve slip mechanism and slip damage through load shifting simulation and miniature roll experiment for development of next-generation sleeve assembly type rolls

Abstract: Next generation rolls such as super-cermet rolls and all-ceramic rolls can be manufactured using only sleeve assembly type rolls and have the advantage of being able to reuse the shaft by replacing the damaged sleeves. However, in some cases failures with unknown causes may occur such as circumferential slippage, shaft pull-out or residual bending deformation at the shrink-fit interface. Such slipping failures cannot be prevented by conventional design concept. This is because even if the resistant torque is greater than the motor torque, the circumferential slippage will occur, and the shaft will come off even if there is no external force. In order to prevent slip failures, we realize the phenomena through numerical simulations, and we clarify the localized slip accumulation that causes sleeve slip during roll rotation. We also identify the geometry of slipping defect through miniature roll experiments. Based on those results, we estimate the fatigue strength of sleeve assembly rolling rolls considering slip defects. The results show that by preventing the slip damage, the fatigue strength of sleeve rolls is almost equivalent to that of conventional solid rolls without shrink-fit.

Biographical Sketch: Nao-Aki Noda, born in 1956, BA in Mechanical Engineering in 1979, and ME in Mechanical Engineering in 1981, both from Kyushu Institute of Technology, Japan. He received a Ph.D. in Mechanical Engineering in 1984 from Kyushu University, Japan. He worked at Kyushu Institute of Technology from 1984 as an Assistant Professor, Associate Professor and Professor. From 2022, he is a Professor Emeritus and he analysed the stress concentration factors (SCFs) for notched test specimens by using the body force method. Then, he proposed the SCF formulas within 1% error in their papers. The formulas provide SCFs under arbitrary dimension of the notch including blunt and sharp notches and shallow and deep notches in the specimens. Also, he rigorously solved several singular integral equations and obtained the exact variation of the stress intensity factors of a semi-elliptical surface crack. For those achievements related to stress analysis, he received JSMS Academic Contribution Award from Japan Society of Materials Science. 2) In joint research with Hitachi Metal, they first started developing all ceramic rolls for use in continuous galvanizing lines (CGLs). He contributed by clarifying methods for reducing tensile stress during immersion in molten metal and during operation. Regarding the ceramic rolls, the group received Sokeizai Industry Technology award from Materials Process Technology Center Japan. Shrink-fitting was found to be essential for the joint of such ceramic rolls, but on the other hand, the shaft slipped out during operation. He realized this new phenomenon in the numerical experiments and clarified that irreversible local slip accumulation causes the failure. Regarding this achievement, Nao-Aki Noda received and JSDE Best Paper Award from Japan Society for Design Engineering. 3) Regarding rolling rolls, he investigated the relation between heat treatment and residual stress through joint research with two roll manufacturing companies. In line with the actual situation, creep deformation was also incorporated into the analysis. Using the obtained residual stress as the initial condition, they also analyzed the stress during rolling clarifying the critical regions at the HSS/DCI boundary of the bimetallic roll and evaluated the fatigue strength of the roll. Regarding those collaborations, Nao-Aki Noda received JSMS Branch Distinguished Service Award. 4) There is an idea to shift the structure of rolling rolls to a sleeve assembly type, which can be a candidate to satisfy the requirements beyond the limits of current rolls as well as to reduce costs. However, even if the sleeve roll is designed so that it does not slip during rolling, the sleeve sometimes slips in the circumferential direction. This sleeve slip cannot have been explained by the conventional design criteria (driving torque < frictional resistance torque). Therefore, his group verified this by numerical experiments using load shifting method, and simulated experiments using miniature rolls. They clarified the process of damage on the inner surface of the sleeve. Regarding those collaborations, Nao-Aki Noda received JSME Materials & Mechanics Division Award, Contribution Award. 5) Nao-Aki Noda also studied several fastening elements. Nao-Aki Noda also showed that the adhesive strength can be expressed as a constant value of ISSF (Intensity of Singular Stress Field). He proposed a desirable specimen geometry of lap joint, which is not affected by bending deformation. He clarified the ISSF under pull out test and microbond test used to estimate fiber bonded strength in fiber reinforced composites. Regarding the achievement, he received JCOM Award for Scientific Papers from JSMS. Regarding a series of pioneering research on strength design in adhesive, joining and fastening, he received JSME Materials & Mechanics Division Award, Achievement Award.

KEYNOTE LECTURE 3

Tuesday 30 July 2024
Time: 9:00 pm to 9:50 pm
Keynote speaker: Professor Lihua Wang
Affiliation: School of Aerospace Engineering and Applied Mechanics, Tongji University, Shanghai, 200092, P.R. China
Title: Improved artificial neural network algorithms and its applications for non-destructive testing

Abstract: In machine learning, the most commonly used and effective algorithm is the artificial neural network (ANN) algorithm, which has the advantages of fast computing speed, strong self-learning ability, good robustness etc. Among the ANNs, back-propagating neural network (BPNN) is one of the most commonly used neural network, which is composed of multi-layer neurons connected to each other to form a network structure. However, due to the lack of theoretical support for the selection of initial parameters and activation function, it often leads to slow convergence and local optimization, and drags the convergence and generalization ability. At the same time, in the mechanical problems, it is difficult to solve some complex problems with complicated models. With the help of artificial neural network algorithms, the numerical computation efficiency can be effectively improved and a new solution can be provided for some complex mechanical problems. On the one hand, based on the loss function analysis of mechanics and the basic theory of fracture mechanics, this work proposes two different improvement schemes of BP algorithm. The selection of weights and thresholds and activation function are optimized respectively. Numerical analysis shows that the improved algorithm can improve the accuracy, convergence and efficiency of numerical results. On the other hand, a deep extended causal convolution network is constructed based on the WaveNet model to repair the missing experimental data of shale fracturing. The proposed new algorithms have higher accuracy, efficiency and convergence for solving the three-dimensional surface reconstruction problem and crack propagation problem. Moreover, the missing shale fracturing experimental data can also be repaired on the selected deep learning algorithms.

We also propose a multilevel Long Short-Term Memory (LSTM) neural network combined with ultrasonic detection to identify the lamination defects in carbon fiber composites. Unlike conventional ultrasonic detection that requires multiple sets of probes, this method only employs a one-to-one transmission and reception mode. This approach uses ultrasound waveform data collected from a single set of probes to predict the locations and sizes of lamination defects. Moreover, the multilevel LSTM method exhibits convergence, and incorporating more data can further promote the prediction accuracy. This method offers a time-saving, labor-saving, and cost-effective solution for detecting and analyzing defects in CFC.

Biographical Sketch: Dr. Lihua Wang is a professor at School of Aerospace Engineering and Applied Mechanics in Tongji University, Shanghai, China. She is currently a General Council Member of the International Association for Computational Mechanics (IACM) and the International Chinese Association for Computational Mechanics (ICACM). She is the recipient of several awards, including the APACM Award for Young Investigators in Computational Mechanics, the ICACM Young Investigator Award, and the Du Qing-Hua Medal & Young Researcher Award of Computational Methods in Engineering. She authored more than 100 journal publications, and has been invited to deliver more than 10 plenary and invited lectures at international conferences. She served as the Editorial Board Member of four journals and guest editor of two journals. Her research interests include development of meshfree methods and machine learning, fluid-structure interaction, inverse problems, functionally graded materials, and rigid-flexible coupling dynamics.

KEYNOTE LECTURE 4

Tuesday 30 July 2024
Time: 2:00 pm am to 2:50 pm
Keynote speaker: Professor Dagang Wang
Affiliation: China University of Mining and Technology, School of Mechanical and Electrical Engineering, Xuzhou 221116, China; China University of Mining and Technology, Institute of Tribology and Reliability Engineering, Xuzhou 221116, China; China University of Mining and Technology, Xuzhou Key Laboratory of Fire Safety Engineering Structure, Xuzhou 221116, China
Title: Study on the estimation of hoisting rope life based on fretting fatigue of steel wires

Abstract: The hoisting ropes of large equipment (such as coal mine shaft, deep-sea drilling rig) are subjected to alternating tension fatigue load and bending fatigue load. They result in fatigue load of the steel wire inside the rope, contact load and relative slip between adjacent steel wires. Then fretting wear, crack initiation, crack propagation and final fracture of steel wire will occur, that is, fretting fatigue. Serious fretting fatigue inside the rope can reduce the load strength and service life of hoisting rope. However, at present, there is no quantitative evaluation method for the service life of hoisting rope based on fretting fatigue damage. It is impossible to predict the actual service life and service reliability of hoisting ropes, which seriously affects the safety and reliability of large equipment. In order to evaluate the hoisting rope life, we carried out the wire fretting fatigue experiment. Based on the experimental results, combined with the finite element method, tribology theory, fatigue and fracture mechanics theory, we constructed the fretting fatigue wear evolution model, crack initiation prediction model and crack propagation prediction model of steel wire. The fretting fatigue life prediction model of steel wire considering wear, crack initiation and propagation was proposed. Based on the bending fatigue experiments of wire rope and finite element analyses, we proposed the hoisting rope life prediction model based on fretting fatigue. The results show that the service life prediction result of hoisting rope is accurate.

Biographical Record: Da-Gang Wang, born in 1984, BA in Mechanical Engineering in 2007, and Ph.D. in Mechanical Engineering in 2012, both from China University of Mining and Technology, China. From 2010-2012, he studied as a joint doctoral student at the University of Wuppertal in Germany. He worked at School of Mechanical and Electrical Engineering, China University of Mining and Technology from 2013. His current position is a Professor and Director of Mechanical Design department. His research areas cover the fretting tribology and Intelligent Damage Identification. 1) With the background of hoisting wire rope in mine, he carried out research on multi-axial fretting fatigue damage of steel wire under complex working conditions and environment, explained the fretting damage mechanism of steel wire, and proposed the fretting fatigue life prediction model and the life prediction model of steel wire rope. 2) He conducted an evaluation study on the service safety of the main cable of a long-span suspension bridge. He carried out theoretical and simulation analysis on the mechanical characteristics of the main cable of the suspension bridge, and explored the tribo-corrosion, tribo-corrosion-fatigue, dynamic contact and micro-slip behavior of the main cable wires through experiments. Based on the experimental and simulation results, he proposed an anti-skid safety evaluation of the main cable strands. 3) Da-Gang Wang also studied the deterioration mechanism of hoisting rope of deep sea drilling rig and quantitative identification of damage. The damage mechanisms of bending tribo-fatigue and bending fatigue behaviors of wire rope were revealed through self-made bending tribo-fatigue testing rig and rope fatigue testing rig with multiple pulley sets. Based on magnetic flux leakage detection technology, machine and deep learning technology, the damage of wire rope is quantitatively identified. 4) He presided over more than 8 state-level projects such as the National Natural Science Foundation project, the National key Research and Development Program of China (sub-project), and etc.). 5) He has published 2 academic monographs, more than 100 papers in well-known journals at home and abroad, and authorized more than 50 domestic and foreign invention patents. He is the winner of one hundred outstanding doctoral theses in Jiangsu Province, and has won four provincial and ministerial level scientific and technological progress awards.

CONFERENCE PROGRAM SUMMARY

Sunday 28 July 2024

Time	Session
5:00 pm to 7:00 pm	Early registration

Monday 29 July 2024

Time	Session
10:00 am to 10:10 am	Opening address
10:10 am to 11:00 am	Keynote lecture 1
11:10 am to 1:00 pm	Session NME1
1:00 pm to 2:00 pm	Lunch Break
2:00 pm to 2:50 pm	Keynote lecture 2
2:50 pm to 6:30 pm	Session FFW 1
6:30 pm to 6:40 pm	Conference Group Photograph

Tuesday 30 July 2024

Time	Session
09:00 am to 9:50 pm	Keynote lecture 3
09:50 am to 12:30 pm	Session NME 2
12:30 pm to 1:10 pm	Posters session
1:10 pm to 2:00 pm	Lunch Break
2:00 pm to 2:50 pm	Keynote lecture 4
2:50 pm to 3:30 pm	Session FFW 2
3:30 pm to 6:30 pm	Online presentations
6:30 pm to 6:40 pm	Conference closing address
7:00 pm to 9:00 pm	Conference Dinner

Wednesday 31 July 2024

Field Visit:

- Dayan Pagoda Tower
- Nanwutai Scenic Area

Sunday 28 July 2024	
5:00 pm to 7:00 pm	**Early registration**

Monday 29 July 2024	
10:00 am to 10:10 am	**Opening address**: **Professor Magd Abdel Wahab**, Ghent University, Belgium
10:10 am to 11:00 am	**Keynote lecture 1**: Recent development on the double-degeneracy mechanism of the BEM/BIEM, **Professor Jeng-Tzong Chen**, Department of Harbor and River Engineering, National Taiwan Ocean University, Taiwan, China
	Session NME 1 **Chair: Professor Jeng-Tzong Chen**
11:00 pm to 11:20 pm	NME1511: Scattering of flexural wave in a thin plate with multiple circular inclusions by using indirect BIEM and addition theorem, **Wei-Ming Lee**
11:20 am to 11:40 am	FFW1397: Adaptive isogeometric multi-material topology optimization based on suitably graded truncated hierarchical B-spline, **Xianda Xie**
11:40 am to 12:00 am	**Coffee Break**
12:00 pm to 12:20 pm	NME1513: Utilizing Fiber Optic Gratings to Investigate the Dynamic Characteristics of Structures Under Thermal Processes, **Jui-Chi Lin**
12:20 pm to 12:40 pm	NME1505: Modelling of Single Lap Functionally Graded Adhesively Bonded Joint Using Finite Element Analysis, **Yanan Zhang**
12:40 pm to 1:00 pm	FFW1380: A Numerical Study of the Effect of Residual Stress on Fretting Fatigue Behavior, **Can Wang**
1:00 pm to 2:00 pm	**Lunch Break**
	Keynote lecture 2 **Chair: Professor Yun-Lai Zhou**
2:00 pm to 2:50 pm	Study on sleeve slip mechanism and slip damage through load shifting simulation and miniature roll experiment for development of next-generation sleeve assembly type rolls, **Professor Nao-Aki Noda**, Kyushu Institute of Technology, Japan
	Session FFW 1 **Chair: Professor Nao-Aki Noda**
2:50 pm to 3:10 pm	FFW1388: Numerical Simulation of Surface Roughness Considering Shot Peening Surface Modification Technology, **Chao Li**
3:10 pm to 3:30 pm	FFW1387: Continuum Damage Driven by Accumulated Crystal Plasticity Energy Dissipation Two-Scale Model for Fretting Fatigue Initiation Life, **Fang Yuan**
3:30 pm to 3:50 pm	FFW1386: A Method for Obtaining more Stable Compressive Residual Stresses, **Kaifa Fan**
3:50 pm to 4:10 pm	**Coffee Break**
4:10 pm to 4:30 pm	FFW1394: Modeling of Fatigue/Creep in Polymer Cage of Large Size Bearing, **Yuri Kadin**
4:30 pm to 4:50 pm	FFW1400: Improve Hydrogel Adhesion by Introducing Pillar Structures at the Interface, **Jiang Xiaojun**
4:50 pm to 5:10 pm	FFW1404: A review on the fatigue cracking of twin boundaries: Crystallographic orientation and stacking fault energy, **Li Linlin**
5:10 pm to 5:30 pm	FFW1383: Simulation and Prediction of the Effects of Corrosion Time and Fretting Wear Cycles on Wear Morphology and Mechanical Behavior of Wire, **Gaofang Wang**
5:30 pm to 5:50 pm	FFW1379: Thermal and mechanical property of carbon fiber reinforced composite, **Yusuf Şahin**
5:50 pm to 6:10 pm	NME1522: Damage detection for truss bridge structure using XGBoost, **Nguyen Huu Quyet**
6:10 pm to 6:30 pm	NME1531: Finite Element Modelling of Cup Drawing Process, **Yingjian Guo**
6:30 pm to 6:40 pm	**Conference Group Photograph**

Tuesday 30 July 2024	
	Keynote lecture 3 **Chair: Professor Magd Abdel Wahab**
09:00 am to 09:50 am	Improved artificial neural network algorithms and its applications for non-destructive testing, **Professor Lihua Wang**, School of Aerospace Engineering and Applied Mechanics, Tongji University, Shanghai, 200092, P.R. China
	Session NME 2 **Chair: Professor Lihua Wang**
09:50 am to 10:10 am	NME1516: Damage Identification in Bridge Structure Using Long Short-Term Memory Networks, **Ngoc Lan Nguyen**
10:10 am to 10:30 am	NME1512: Theoretical Analysis, Numerical Calculation and Experimental Measurement on Transient Wave Propagation of Structure for Multi-span plate, **Guozhao Dai**
10:30 am to 10:50 am	NME1508: A Radial Basis Collocation Method for the High-Order Korteweg-De Vries Equations, **Zhiyuan Xue**
10:50 am to 11:10 am	**Coffee Break**
11:10 am to 11:30 am	FFW1414: Fatigue performance assessment of steel-UHPC composite deck based on hot spot stress method considering residual stress, **Shiqiang Qin**
11:30 am to 11:50 am	FFW1381: Damage Identification of Complex Structures Using a Surrogate-Assisted Model, **Yifei Li**
11:50 am to 12:10 pm	FFW1401: Fatigue of Dual Crosslink Hydrogels with Metal-Ligand Coordination Bonds, **Zheng Yijian**
12:10 pm to 12:30 pm	NME1506: Enhanced ANN predictive model of porous sandwich functionally graded plates reinforced with graphene nanoplatelets using isogeometric analysis, **Jianfu Bai**
	Posters session
12:30 pm to 1:10 pm	FFW1405: Grain boundary fracture of 2024 aluminum alloy using crystal plasticity finite element method, **Qi Zhao**
	FFW1391: The Effect of Indium Tin Oxide (ITO) Concentration on the Wear and Mechanical Properties of an Epoxy Resin, **Juana Abenojar**
	FFW1390: Reinforcement of living space in the bus using rCF (recycled carbon fibres) from expired prepreg from the aircraft industry, **Miguel-Angel Martinez**
	NME1533: Numerical Modelling of Fretting Damage Considering Oxidized Layer at High Temperatures, **Chao Li**
	NME1507: Revealing the Effect of Contact Stress on the Fretting Fatigue Life: From the Perspective of Crack Propagation, **Kaifa Fan**
	NME1530: Contact Mechanical Properties and Strain Analysis of Winding and Hoisting Steel Wire Rope in Different Contact States, **Gaofang Wang**
	NME1503: Predicting Initial In Situ Stresses in dam Sites Using an Advanced Meta Model, **Yifei Li**
	NME1502: Numerical Analysis of the Effect of FGM Coatings on Fretting Fatigue Behavior, **Can Wang**
	FFW1416: A Hybrid Approach for Structure Damage Identification Using Optimization Algorithm and Artificial Neural Networks, **Ngoc Lan Nguyen**
	FFW1385: Design Optimization of Multi-Directional Porous Sandwich Functionally Graded Plates Reinforced with Graphene Nanoplatelets Based on Isogeometric Analysis and Sinh Cosh Optimizer, **Jianfu Bai**
	FFW1384: Analysis of Single Lap Functionally Graded Adhesive Joints with Different Adherends, **Yanan Zhang**
1:10 pm to 2:00 pm	**Lunch Break**

Tuesday 30 July 2024	
	Keynote lecture 4 **Chair: Professor Yun-Lai Zhou**
2:00 pm to 2:50 pm	Study on the estimation of hoisting rope life based on fretting fatigue of steel wires, **Professor Dagang Wang**, China University of Mining and Technology, China
	FFW 1 **Chair: Professor Dagang Wang**
2:50 pm to 3:10 pm	FFW1412: The New Design of an Elevator's Door Mechanism, **Yusuf Şahin**
3:10 pm to 3:30 pm	FFW1393: Evolution Mechanism of Three-point Bending Impact Fatigue Damage in Ultra-high Strength Steel 23Co14Ni12Cr3MoE Material, **Yang Qiang**
	Online presentation **Chair: Professor Yun-Lai Zhou**
3:30 pm to 3:50 pm	NME1509: Multi-hazard analysis of steel buildings subjected to earthquake and fire, **Mattia Francioli**
3:50 pm to 4:10 pm	NME1485: On the question of applying one creep model with a real structural parameter in the mechanics of deformable solids, **Rafael Shaikhutdinov**
4:10 pm to 4:30 pm	**Coffee break**
4:30 pm to 4:50 pm	NME1527: Isogeometric Vibration Analysis of Auxetic Honeycomb Sandwich Plates, **Usama Hamid**
4:50 pm to 5:10 pm	FFW1409: Finite Element Analysis of Fretting Wear of Steel Wires: A Comparison of Elastic and Plastic Wear Models, **Muhammad Imran**
5:10 pm to 5:30 pm	FFW1413: Analysing Frictional Noise for Wear Monitoring under dry and lubrication condition: Experimental Modelling with Pin-On-Disc Tribometer, **Mohamed A Ahalaiel Kalifa**
5:30 pm to 5:50 pm	FFW1408: An Overview of Recent Research on Fretting Fatigue Behavior of Ni-Based Super Alloys at Elevated Temperatures, **Bilal Ahmed**
5:50 pm to 6:10 pm	NME1504: Numerical investigation to predict the geometrical and mechanical properties of a flow-formed workpiece using 1.7220 steel, **Acar Can Kocabıçak**
6:10 pm to 6:30 pm	NME1528: Mitigation of Noise and other Variations in Vibration Responses for Damage Characterization for Damage Detection in Composites, **Irfan Shirazi**
6:30 pm to 6:40 pm	**Conference closing address – Prof. M Abdel Wahab**
7:00 pm to 9:00 pm	**Conference Dinner**

Wednesday 31 July 2024

Field Visit: 8:20 am from Ramada Bell Tower Hotel

Ramada Bell Tower Hotel → Dayan Pagoda (30 minutes), visit the tower and square, 1 hour

→ Nanwutai Scenic Area (1 hour transport)

→ Climb the mountain, two hours, fast food lunch

→ Back to the hotel, one and half hour

FFW & NME 2024

INSTRUCTIONS TO SPEAKERS

- Your oral presentation should not exceed 15 minutes. If your presentation stretches over 15 minutes, you must end your presentation to ensure strict adherence to the programme.
- Your presentation will be followed by a Question and Answer (Q/A) session not exceeding 5 minutes.
- Please submit your presentation file(s) as PDF or Microsoft Powerpoint to the section helper at the end of the preceding session, or at least 5 minutes before the start of your session at the respective venue.
- Please also meet up with the Chairperson of your session to inform him of your presence.
- All presentation will be streamed through the MS link: Click here to join the meeting
- For physical poster presentation, please upload your poster size 160 cm (height) ×60 cm (width) in your submission system or send it to the conference chairman. The conference organizer will print it for you, send it to the conference venue and make it ready for your presentation.