

## Conference Outline

### Monday 1 July 2024

08:30 – 09.30	Registration and coffee
09.30 – 09.50	Open ceremony
09.50 – 10.50	Keynote 1
10.50 – 11.10	Break
11.10 – 12.50	Technical sessions 1, 2 and 3
12:50 – 13.50	Lunch
13.50 – 14.50	Technical sessions 4, 5 and 6
14.50 - 15.10	Break
15.10 – 16.30	Technical sessions 7, 8 and 9
18.30 – 20.30	Drinks and canape reception

### Tuesday 2 July 2024

08:30 – 09.00	Coffee
09.30 – 10.00	Keynote 2
10.10 – 11.30	Technical sessions 10, 11 and 12
11.30 – 11.50	Break
11.50 – 12.50	Technical sessions 13, 14 and 15
12.50 – 13.50	Lunch
13.50 – 15.10	Technical sessions 16, 17 and 18
15.10 - 15.30	Break
15.30 – 16.30	Technical sessions 19, 20 and 21
18.30 – late	Conference banquet

### Wednesday 3 July 2024

08:30 – 09.00	Coffee
09.30 – 10.00	Keynote 3
10.10 – 11.10	Technical sessions 22, 23 and 24
11.10 – 11.30	Break
11.30 – 13.10	Technical sessions 25, 26 and 27
13.10 – 14.00	Lunch
14.00 – 15.00	Tour of experimental facilities (optional)

# Conference programme by session

## Monday 1 July

Keynote 1		
1    Metastructures and metamaterials 1	2    Structural dynamic modelling and validation 1	3    Vibration isolation
4    Active vibration control and smart structures 1	5    Vibroacoustics and noise control	6    Experimental techniques 1
7    Damping	8    Nonlinear vibration 1	9    Vibration based NDE and SHM 1

## Tuesday 2 July

Keynote 2		
10    Passive vibration control	11    MEMs / NEMs resonators	12    Stochastic dynamics and uncertain systems
13    Rotating machinery	14    Energy harvesting	15    Pipeline dynamics 1
16    Acoustic black holes	17    Metastructures and metamaterials 2	18    Nonlinear vibration 2
19    Vibration absorbers 1	20    Active vibration control and smart structures 2	21    Experimental techniques 2

## Wednesday 3 July

Keynote 3		
22    Vibration absorbers 2	23    Vibration based NDE and SHM 2	24    System ID and inverse problems
25    Railway vibration and noise	26    Structural dynamic modelling and validation 2	27    Pipeline dynamics 2
Tour of experimental facilities		

## MONDAY 1 JULY - MORNING

	Room 1001	Room 4011	Room 4013
<b>09.30</b>	<b>Opening ceremony</b>  <b>Stephen Turnock</b> Head of School of Engineering University of Southampton  <b>Tim Waters</b> Conference chair		
<b>09.50</b>	<b>Keynote 1 –Mahmoud Hussein</b> <b>University of Colorado Boulder</b> Metadamping and metaharvesting: Vibration engineering at the intrinsic material level Chair: Sergey Sorokin		
<b>10.50</b>	<b>Break</b>		
	<b>Metastructures and metamaterials 1</b> Chair: Jordan Cheer	<b>Structural dynamic modelling and validation 1</b> Chair: Lawrie Virgin	<b>Vibration isolation</b> Chair: Tiejun Yang
<b>11.10</b>	Kristian Hansen Determining stop band locations in periodic waveguides by conventional finite element modal analysis	Abasiouding Jackson ANSYS modelling of piezoelectric smart beams using Ritz vector and super element method	Vinod Yadav An inclined beam-based vibration isolator design to attain quasi-zero- stiffness characteristics
<b>11.30</b>	Leopoldo de Oliveira The use of geometrical nonlinear local resonators to enhance the vibration control performance of metamaterial structures	Shuyang Zhang An adaptive reduction method for viscoelastic structures without approximation on viscoelasticity	Guoying Zhao Towards ultra-low frequency seismic vibration isolation: dynamic analysis and control aspects
<b>11.50</b>	Felix Langfeldt A quasi-infinite criterion for finite plate-type acoustic metamaterials	Kyle Dubber The contribution of higher order modes to shock response spectra	Emily Nar Hydraulic interconnected suspension design utilising the structure- immittance approach
<b>12.10</b>	Greg Dorgant The influence of elastic metamaterial bandgaps on plastic wave propagation	David Schoenebeck Passive reduction of reflected surface acoustic waves	Cui Chao Vibration energy transfer in vibration isolators with frictional inerter
<b>12.30</b>	Pai Wang Nonlocal phononic crystals and inerter- based vibro-elastic metamaterials: research contributions from Utah, 2019-2024	Lawrie Virgin 3D-printing and structural dynamics (including resonance)	Tiejun Yang ‘Twin mode’ phenomenon in floating raft isolation system based on plate- shell coupled structure
<b>12.50</b>	<b>Lunch</b>		

## MONDAY 1 JULY – AFTER LUNCH

Lecture Theatre A (1001)	Harvard Lecture Theatre (4011)	Room 4013
<b>Active vibration control and smart structures 1</b> Chair: Emiliano Rustighi	<b>Vibroacoustics and noise control</b> Chair: Mahmoud Karimi	<b>Experimental techniques 1</b> Chair: Guglielmo Aglietti
<b>13.50</b> Gabriel Rodrigues Adaptive piezoelectric vibration absorber: design of the analogue self-tuning shunt set to maximise electric power absorption	Daniel Martins Vibroacoustic response of a heavy fluid-loaded plate with ABH stiffeners	Domenico Antonio Rita Squeal testing on a reduced-scale inertia dynamometer
<b>14.10</b> Nasser AlQahtani Towards nonlinear model predictive control of flexible structures using Gaussian Processes	Pablo Miranda Valiente Modelling the una-corda effect in pianos	Mattia Dal Borgo Merging multiple hammer and shaker measurements to extend the FRFs frequency range
<b>14.30</b> Francisco Williams-Riquer Prediction of induced soil vibration during pile vibrodriving using Dynamic Mode Decomposition (DMD)	Manish Kumar Swain Design of hybrid sonic cage to mitigate noise using sonic crystal and melamine foam	Benjamin Bondsman Exploring cross-laminated timber transfer functions using deep learning
<b>14.50</b>	<b>Break</b>	
<b>Damping</b> Chair: Jason Jiang	<b>Nonlinear vibration 1</b> Chair: Jose Balthazar	<b>Vibration based NDE and SHM 1</b> Chair: Michal Kalkowski
<b>15.10</b> Aykut Tamer Utilising computational fluid dynamics to investigate damping effects in fluid inerter-based vibration control devices	Sergey Sorokin The 'stretching-due-to-bending' nonlinear effect in a slightly curved beam	Marcela Machado Data-driven machine learning to pattern recognition, detection, and quantification of loosening torque in bolted joints
<b>15.30</b> Dongze Cui Computation of the damping loss factor of heterogeneous meta-structure using the wave finite element-based methodology	Ahmad Algara A numerical study on the interaction between friction and vibration in a friction-involved dynamical	Akshay Satpute Vibration based crack detection in plates using natural frequency degradation
<b>15.50</b> Emiliano Rustighi Characterisation of an adaptive magnetorheological elastomer impact support	Zhiyuan Ji Design and characteristic analysis of a quasi-zero stiffness actuator	Xin Yang A novel fusion approach by integrating ultrasonic guided waves and vibration measurements for damage location
<b>16.10</b> Simon Mwakitabu Non-linear modelling and simulating of primary vertical hydraulic railway dampers characteristics	<b>Finish</b>	<b>Finish</b>
<b>16.30</b> <b>Finish</b>		
<b>18.30</b> <b>Reception, Solent Sky aircraft museum, Albert Road South, Southampton SO14 3FR</b>		

## TUESDAY 2 JULY - MORNING

Lecture Theatre A (1001)	Harvard Lecture Theatre (4011)	Room 4013
<b>09.00</b> <b>Keynote 2 – Guglielmo Aglietti</b> <b>University of Auckland</b> Vibration testing of spacecraft structure - Virtual Testing & Multi DoF Shakers Chair: Paulo Gonçalves		
<b>Passive vibration control</b> Chair: Neil Ferguson	<b>MEMs / NEMs resonators</b> Chair: Amal Hajjaj, Stewart McWilliam	<b>Stochastic dynamics and uncertain systems</b> Chair: Alice Cicirello
<b>10.10</b> Emiliano Rustighi Passive earthquake vibration mitigation of a steel tower crane by joint dampers	Stewart McWilliam Nonlinear performance enhancement of imperfect ring-based Coriolis vibratory gyroscopes	Murat Kara The effect of joint uncertainty on scattering properties using a hybrid methodology
<b>10.30</b> Paulo Gonçalves Controlling low frequency vibration using hanging chains	Jose Balthazar Nonlinear dynamics of atomic force microscopy with viscoelastic term and Casimir force interactions: an overview	Takahiro Tsuchida Response probability density of a single-degree-of-freedom linear system under non-Gaussian random excitation with dominant frequency
<b>10.50</b> Zixiao Wang Passive vibration control of pantograph-catenary contact dynamics using an air vane motor	Stewart McWilliam Improving the frequency stability of capacitive ring-based Coriolis vibrating gyroscopes	Houyu Lu Uncertainty quantification for damage detection in 3D printed auxetic structures based on ultrasonic guided-wave using Flipout probabilistic convolutional neural network
<b>11.10</b> Shufeng Lu Vibration suppression of an axially retractable cantilever composite plate based on NES	Amal Hajjaj Subcombination internal resonances in hybrid-shaped MEMS resonators	Alice Cicirello Physics-enhanced machine learning: a position paper for dynamical systems investigations
<b>11.30</b>	<b>Break</b>	
<b>Rotating machinery</b> Chair: Fadi Donal	<b>Energy harvesting +</b> Chair: Ben Davis	<b>Pipeline dynamics 1</b> Chair: Fabricio Almeida, Jen Muggleton
<b>11.50</b> Muhammad Saad Fasih Analytical estimation of maximum amplitude during passage through resonance of a flexible rotor	Hossein Shabanalinezhad Designing a vibration energy harvester for several directions of excitation in planar motion	Shahab Khodayari Experimental and numerical investigation into the effect of orifice geometry on the discharge coefficient in gas pipelines
<b>12.10</b> Ulrich Werner Active vibration control of an induction motor with sleeve bearings and electrodynamic actuators between motor feet and steel frame foundation regaining electromagnetic excitation	Linchuan Zhao Mechanical adaptive collaborative human motion energy harvesting	Jonas Holzbrecher Measuring the characteristic pulsation of a hydraulic steering pump with reflectionsless pipe-termination
<b>12.30</b> Lukas Hafner Simulated bubble oscillations in gearboxes for electrified vehicles	Tim Waters Aircraft de-icing using time-reversed guided waves	Jen Muggleton On the Significance of Parameter Uncertainties for Prediction of Leak Noise Wave in Buried Pipes
<b>12.50</b>	<b>Lunch</b>	

## TUESDAY 2 JULY – AFTER LUNCH

Lecture Theatre A (1001)	Harvard Lecture Theatre (4011)	Room 4013
<b>Acoustic black holes</b> Chair: Elisabetta Manconi	<b>Metastructures and metamaterials 2</b> Chair: Mahmoud Hussein	<b>Nonlinear vibration 2</b> Chair: Jian Yang
<b>13.50</b> Lawrence Singleton A torsional acoustic black hole	Filippo Dall'Olio A preliminary study on band-gaps formation in fluid-filled structures with periodic liquid dampers	Yucai Zhong Parameter optimization and energy flow analysis of the piezoelectric vibration absorber with nonlinear synthetic inductance
<b>14.10</b> Max Käfer Designing stacked multi-wedge acoustic black holes using parameter variations	Vinicius Cleante Forming a super attenuation band in a beam-like structure using an array of moment resonators	Jie Yuan The impact of fretting wear on the nonlinear dynamic response of assembled structures
<b>14.30</b> Zhiwei Wan A beam attached with an acoustic black hole damping layer	Jingjian Xu Vibration and noise radiation mitigation in the natural gas pipeline using the novel attachable resonant acoustic metamaterials	Kevin Dekemele A mechanism for nonlinear geometric damping in passive vibration control: concept, realization and experiments
<b>14.50</b> Archie Keys Comparison of different cost functions for the optimisation of a modified acoustic black hole beam termination	Marcela Machado Wave propagation in honeycomb lattices applied in wind turbine blade	Harikrishnan Venugopal Design of a piecewise nonlinear energy sink for torsional vibration attenuation
<b>15.10</b>	<b>Break</b>	
<b>Vibration absorbers 1</b> Chair: Alex Shaw	<b>Active vibration control and smart structures 2</b> Chair: L. de Oliveira	<b>Experimental techniques 2</b> Chair: Daniil Yurchenko
<b>15.30</b> Atila Almeida Reducing the tuning frequency of a vibration neutraliser with magnetic forces	Filippo Dall'Olio Residual vibration reduction using a time-parametrised B-spline motion-control technique	Julian Staiger On model-based load measurements in virtual points
<b>15.50</b> Fabio Santicioli Design and testing of an arch type vibration neutralizer	Haoyu Wen A feedback control strategy with amplitude and phase compensation for active vibration control	Dahye Son Virtual sensing of unmeasured vibration response of SPMSM cause by electromagnetic effect
<b>16.20</b> Yibo Wang On the anti-resonant frequency shifting characteristics of the dynamic vibration absorber	Tiejun Yang Inertial actuator with high-static-low-dynamic stiffness suspension for active vibration control	Evangelos Ntotsios Application of the indirect method for measuring the dynamic stiffness of building vibration isolation bearings
<b>16.30</b>	<b>Finish</b>	
<b>18.30</b> Conference banquet, <i>Harbour Hotel, 5 Maritime Walk, Southampton SO14 3QT</i>		

## WEDNESDAY 3 JULY

Lecture Theatre A (1001)	Harvard Lecture Theatre (4011)	Room 4013
<b>09.00</b> <b>Keynote 3 – Jason Zheng Jiang</b> <b>University of Bristol</b> Generative design for dynamic performance transformation Chair: Mike Brennan		
<b>Vibration absorbers 2</b> Chair: Vinicius Cleante	<b>Vibration based NDE and SHM 2</b> Chair: Fulei Chu	<b>System ID and inverse problems</b> Chair: Tanmoy Chatterjee
<b>10.10</b> Jean Carneiro On the non-conventional use of neutralizers in beams to form the super attenuation band	Marios Impraimakis Structural health monitoring using response-only measurements by a novel Kullback–Leibler divergence approach	Chien-Chou Chen Tension estimation for cable with added mass based on mode shape
<b>10.30</b> Baiyang Shi Vibration suppression and energy transfer analysis of beam structures with inerter-based dynamic vibration absorber	Houyu Lu Evaluation of an efficient modeling framework for ultrasound wave propagation in large and complex plate-like structures	Wen-Hwa Wu Field validations of a tension estimation method simply using local vibration measurements for linked suspenders
<b>10.50</b> Jose Balthazar Experimental analysis of the electromagnetic damper of a non-ideal system revisited	Fulei Chu Damage identification of wind turbine blades using an adaptive method of compressive beamforming	Tanmoy Chatterjee Sparse identification of quasi-zero stiffness dynamics
<b>11.10</b>	<b>Break</b>	
<b>Railway vibration and noise</b> Chair: David Thompson	<b>Structural dynamic modelling and validation 2</b> Chair: Brian Mace	<b>Pipeline dynamics 2</b> Chair: Jen Muggleton, Fabricio Almeida
<b>11.30</b> Lutz Auersch Prediction of ground vibrations from rail tunnels – basic rules from finite-element, boundary element and wavenumber-domain calculations	Zhiguang Song A condensation method for dynamic analysis of fluid-structure interaction structural system	Joshua Hooper Performance analysis of an array processing approach to locating leaks in water pipes
<b>11.50</b> Lucky Adoh A model for train-induced vibration at railway crossings for energy harvesting applications	Songhao Chen Coupled vibration analysis of partially liquid-filled functionally graded material cylindrical shells with internal horizontal plates	Adila Nalisa Binti Mohd Roslan Dispersion characteristics of flexural waves in vacuo and submerged fluid-filled pipes
<b>12.10</b> Zi Hao Yung Optimal trailing arm bush design for reduction in wheel-rail surface damage	Davide Raffaele A preliminary beam model for in-vacuo Tuneable Structured Fabrics	Jen Muggleton Helically wound optical fibres for pipeline leak detection
<b>12.30</b> Mishaal Sanad Pressure regulator modelling for passive control of pantograph-catenary interaction dynamics	Edoardo Menga Estimating the fatigue loads by training a numerical model with flight test data	Fabricio Almeida On the evidence of two wave types propagating in plastic-water-filled pipes with a leak excitation
<b>12.50</b> Giacomo Squicciarini A case study of railway curve squeal	Brian Mace Locking and veering in periodically coupled waveguides and application to two coupled beams	Didier Ilunga Numerical and experimental investigation into the effect of pipe material stiffness on the behaviour of water leakage through longitudinal cracks in pressured pipes
<b>13.10</b>	<b>Closing ceremony</b>	
<b>13.15</b>	<b>Lunch</b>	
<b>14.00</b>	<b>Tour of the facilities (optional)</b>	