

## Aula Magna - Plenary Auditorium - Building 7

8:30 - 9:00	<p>Opening Cerimony:  <b>Dr. PIERVINCENZO RIZZO</b> (University of Pittsburgh, United States)  EWSHM 2022 Chair</p>	
	<p>Greetings from  <b>DR. MASSIMO MIDIRI</b> ( Rettore) and <b>PROF. ANTONINO VALENZA</b> (Dean of Engineering) of the University of Palermo</p> <p>Greetings from  <b>DR. JAMES R. MARTIN</b> Dean of the SWANSON School of Engineering, University of Pittsburgh, United States</p>	
09:00 - 09:50	<p>Keynote 1:  <b>DR. MATHIAS BUDERATH</b> (Airbus Germany)  Improving Mission Capability Planning and Preparation through  Health Monitoring and Management (including Structural Health Management)</p>	
09:50 - 10:20	<p>Invited 1:  <b>DR. ELENI CHATZI</b> (ETH Zurich, Switzerland)  A hybrid modeling approach to learning, monitoring and virtualizing dynamical systems</p>	
10:20 - 10:50	<p>Invited 2:  <b>DR. HOLGER SPECKMANN</b> (Geschäftsführer Testia GmbH, Germany)  An Interpretation of SHM 4.0</p>	

**Monday - Day 1**

**Aule Polo Didattico - Building 19**

10:50 - 11:30				Coffee Break					
		Aula 3		Aula 4		Aula 5			
SESSION		Innovative Ideas for Monitoring Vibrations		SHM of engineering structures using smart multifunctional materials and systems		Population-level performance and health monitoring			
SESSION CHAIRS		Antonina Pirrotta (University of Palermo) and Carmelo Gentile (Politecnico di Milano)		Filippo Ubertini and Antonella D'Alessandro (University of Perugia)		Lawrence Bull (Alan Turing Institute) and Mark Girolami (university of Cambridge)			
11:30 - 11:50	16	Energy harvesting for structural health monitoring of railway bridges	J. Cámara, A. Romero, Emma Moliner, María Dolores Martínez-Rodrigo, P. Galvín	32	Structural health monitoring of FRP-reinforced concrete bridges using vibration responses	Nafiseh Kiani, Mohammad Abedin, Christian Steputat, Armin Mehrabi, A. Nanni	50	Bayesian domain-adapted Gaussian mixture models for population-level monitoring	P. Gardner, Keith Worden, Nikolaos Dervilis, Mark Girolami, L. Bull
11:50 - 12:10	64	A Hybrid Method for Damage Detection Using Acceleration Response of Bridges	Semih Gonen, Erduran Emrah	65	Strain monitoring of a structural adhesive bond by embedding a polymer optical fiber	Josef Weiland, M. Lubber, K. Rostan, A. Schiebahn, Rainer Engelbrecht, Uwe Reisinger	94	A generalised form for a homogeneous population of structures using an overlapping mixture of Gaussian processes	Tina Dardeno, L. Bull, Nikolaos Dervilis, Keith Worden
12:10 - 12:30	111	Stability Monitoring of Bridges via Dual Frequency Terrestrial Radar Measurements	R. Palamà, Guido Luzi, Brais Barros-González, Belén Riveiro-Rodríguez, M. Breschi	73	Electromechanical Testing of Smart Lime Mortars for Structural Health Monitoring	A. Drougkas, V. Sarhosis, Muhammed Basheer, A. D'Alessandro, Filippo Ubertini	103	When is a Bridge Not an Aeroplane? Part II: A Population of Real Structures	G. Delo, A. Bunce, E.J. Cross, J. Gosliga, D. Hester, C. Surace, K. Worden, D.S. Brennan
12:30 - 12:50	162	Best practices for vision-based vibration monitoring for civil structures	K.Hiemstra, Leon Bekken, Albert-Jan Sneathlage, Johannes Singer, Edo Noordermeer	77	On the numerical modeling of interlaminar sensors in a composite stiffener: optimization under fracture mechanical aspects	Max Linke, Rolf Lammering	202	Hierarchical upscaling of data-driven damage diagnostics for stiffened composite aircraft structures	Agnes Broer, Nan Yue, G. Galanopoulos, R. Benedictus, T. Loutas, D. Zarouchas
12:50 - 13:10	396	An extension of ASM for modal shapes identification	Salvatore Rusotto, A. Di Matteo., Antonina Pirrotta	92	Smart inlays for bondline surveillance in composites	Chresten von der Heide, Julian Steinmetz, A.S Dietzel	267	Modelling the Times-To-Failures using a Statistical Hierarchical Model	Maharshi Dhada, L. Bull, Mark Girolami, Ajith Parlikad
13:10 - 13:30				428	Improved Structural Health Monitoring Features Of 3D Printed Structures Using Piezoelectric Implants	Xiaopeng Cui, Olivier Bareille, Michelle Salvia, Bruno Berthel			
13:10 - 14:30				Lunch Break					

**Monday - Day 1**

**Aule Polo Didattico - Building 19**

10:50 - 11:30				Coffee Break					
		Aula 6		Aula 7		Aula 8			
SESSION		Machine learning and modelling in SHM		Robust Statistical and Probabilistic Methods for SHM		GENERAL SESSION			
SESSION CHAIRS		Antonina Pirrotta (University of Palermo) and Carmelo Gentile (Politecnico di Milano)		John Sakellariou (University of Patras, Greece) and Spilios Fassois (University of Patras, Greece)		Marco Lo Cascio and Vincenzo Gulizzi (University of Palermo)			
11:30 - 11:50	35	Optimized electromechanical impedance spectroscopy using minimal number of test frequencies	Teresa Slanina, J. Moll, Christian Kexel, John Barker	43	On the detection of thickness loss in ship hull structures through strain sensing	Nicholas Silonis, K.Anyfantis	28	Structural health monitoring of adhesively bonded skin-stiffener composite joints using distributed fibre optic sensor	Shashank Pant, Marc Genest, Lucy Li, Gang Li
11:50 - 12:10	44	A new unsupervised learning approach for CWRU bearing state distinction	Xiao Wei, Ting Sheng Lee, Dirk Soeffker	61	Statistical pattern recognition for optimal sensor placement in damage detection applications	Theodora Liangou, A. Katsoudas, Nicholas Silonis, K.Anyfantis	55	Durability and reliability of piezoelectric transducers bonded through a novel procedure for SHM of thermoplastic composite structures	Tasdeeq Sofi, M. Rodriguez Gude, M. Isabel Martin, Eduardo Lorenzo, Peter Wierach
12:10 - 12:30	48	Machine learning based predictive modelling of a steel railway bridge for damage modelling of train passages and different usage scenarios.	maximillian weil, Negin Sadeghi, N. Noppe, W. Weijtjens, C.Devriendt	95	Particle filter-based delamination shape prediction in composites	Tianzhi Li, F. Cadini, Manuel Chiachio, J. Chiachio, Claudio Sbaruffati	72	The capabilities of the Terahertz radiation in non invasive defect inspection in alumina ceramics	Waldemar Świdorski, Martyna Strag, Paweł Hłosta
12:30 - 12:50	74	Damage detection in composites by AI and high-order modelling surface-strain-displacement analysis	M. Enea, Alfonso Pagani, Erasmo Carrera	193	Vibration-based quality assessment of metallic turbine blades using measurement uncertainty	Liangliang Cheng, Wim VanPaepegem, Mathias Kersemans	84	Towards Video-Based System Identification and Finite Element Model Updating of Civil Structures and Infrastructures	M. Civera, Jafarali Parol
12:50 - 13:10	79	Towards realistic damage modelling using quadtree decomposition in the context of ultrasonic guided waves-based SHM	Daniel Lozano, Jannis Bulling, Jens Prager, Hauke Gravenkamp, Carolin Birk	250	A Kriging approach to model updating for damage detection	G. Dessena, Dmitry I. Ignatyev, James F. Whidborne, L. Zanotti Fragonara	91	Monitoring of Hydraulic Structure: Problem and Approach	Charly Kühne, Christoph Stephan
13:10 - 13:30	292	Experimental damage localization and quantification with a numerically trained convolutional neural network.	Hadrien Postorino, Eric Monteiro, Marc Rebillat, Nazih Mechbal	325	Real-Time Structural Health Monitoring of aero-nautical structures using PCA-Based statistics	Yoav Ofir, Iddo Kressel, Uri Ben-Simon, Jonathan Bohbot, Tur Moshe	240	An integrated Fiber Optic based SHM system for structural composite components: application to a racing motorbike fork	G. Sciamè, Daniela Rigamonti, P. Bettini, P. Tagliabue, G. Sala
13:10 - 14:30				Lunch Break					

**Monday - Day 1**

**Aule Polo Didattico - Building 19**

10:50 - 11:30				Coffee Break					
		Aula 9		Aula 10		Aula 11			
SESSION		Damage detectability and effects of environmental and operational variability in SHM		Unmanned vehicles for SHM		Guided Waves in Structures for SHM			
SESSION CHAIRS		D. García Cava (The University of Edinburgh, UK) and D. Avendaño Valencia (University of Southern Denmark)		Zhi Qiang Chen (University of Missouri-Kansas City)		Wieslaw Ostachowicz (Polish Academy of Sciences, Poland) and Annamaria Pau (Sapienza University of Rome, Italy)			
11:30 - 11:50	4	Stitching Effect on Impact Behavior of Composite Materials	Claudio Cigliano, F. Donadio, V. Lopresto, I. Papa, P. Russo, Vito Pagliarulo	19	Mixed Reality Human-in-the-loop Damage Inspection Towards Autonomous Robotic Operation	ZhiQiang Chen, Qingli zeng, Molan Zhang	26	Numerical Investigations on the influence of prestress on Lamb wave propagation	Tilmann Barth, Rolf Lammering
11:50 - 12:10	9	Pre-and post-fracture experimental vibration analysis for in-field damage and vulnerability measure in existing glass slabs	Chiara Bedon, Salvatore Noé	165	Measurement Accuracy Analysis using Drone for Structural Health Monitoring	Jongyun Han, Sechang Kim, Jihun Oh, Taewoo Kim, Minsu Kim, Hongjin Kim	27	Damage assessment in composite material using air-coupled transducers	Damian Mindykowski, T. Wandowski, P. Kudela, P. Fiborek, M. Radzienski
12:10 - 12:30	30	Operational modal analysis for scour detection in mono-pile offshore wind turbine	Kevin Qu, D. Garcia Cava, Stuart Killbourn, Alasdair Logan	182	Bridge Status Realization and Management Enhanced by UAV, SfM, and Deep Learning	Katrina Mae Montes, Ji Dang, Sal Saad Al Deen Taher, Jiaming Liu, Pang-jo Chun	36	The Global-Local approach for damage detection in composite structures and rails	Margherita Capriotti, F. Lanza di Scalea, Antonino Spada
12:30 - 12:50	31	Interpretable novelty index for robust damage detection	Artur Movsessian, D. Garcia Cava, Dmitri Tcherniak	593	A Virtual Reality Environment for Developing and Testing Autonomous UAV-based Structural Inspection	Xin Peng, Gaofeng Su, ZhiQiang Chen, Raja Sengupta	49	A numerical study on baseline-free damage detection using frequency steerable acoustic transducers	Octavio A. Márquez Reyes, Beata Zima, J. Moll, Masoud Mohammadgholiha, L. De Marchi
12:50 - 13:10	40	Addressing regressor selection with stepwise nonlinear regression for robust EOv mitigation	Callum Roberts, D. Garcia Cava, L. D. Avendaño-Valencia				71	The influence of temperature uncertainty in damage detection with guided waves	Feifei Ren, Ilias Giannakeas, Zahra Sharif Khodaei, Ferri Aliabadi
13:10 - 13:30	163	Damage localization through assignment of invariant eigenpairs	Martin Ulriksen, Esmaeil Memarzadeh, Dionisio Bernal, Jose Lopez				609	Experimental identification of damage in Single Lap Joint	F. Nicassio, Gennaro Scarselli
13:10 - 14:30				Lunch Break					

	Aula 3		Aula 4		Aula 5	
SESSION	Innovative Ideas for Monitoring Vibrations		SHM of engineering structures using smart multi-functional materials and systems		Population-level performance and health monitoring	
SESSION CHAIRS	Filippo Ubertini (University of Perugia)		Antonella D'Alessandro (University of Perugia)		Keith Worden and P. Gardner (University of Sheffield)	
14:30 - 14:50	404	Photomonitoring: an innovative remote sensing solution for the static and dynamic monitoring of structures and infrastructures  A. Brunetti, A. Cosentino, M. Fiorio, M. Gaeta, P. Mazzanti, Saverio Romeo	123	Metrological evaluation of new industrial SHM systems based on MEMS and microcontrollers  M. Brambilla, P. Chiariotti, F. Di Carlo, P. Isabella, A. Meda, P. Darò, A. Cigada	326	Population-Level Modelling for Truck Fleet Survival Analysis  L. Bull, Maharshi Dhada, Olof Steinert, Tony Lindgren, Ajith Parlikad, Mark Girolami
14:50 - 15:10	431	Estimating the tensile force in ancient metallic tie-rods from vibration tests  Antonello Ruccolo, Carmelo Gentile	145	Monitoring road infrastructures with self-sensing asphalt pavements  F. Gulisano, Thanyarat Buasiri, Andrzej Cwirzen, J. Gallego	344	On the use of graph kernels for assessing similarity of structures in population-based structural health monitoring  Chandula Wickramarachchi, Julian Gosliga, Elizabeth Cross, Keith Worden
15:10 - 15:30	443	Smartphone-based bridge monitoring using Vehicle-Bridge Interaction: an experimental study on a bridge in Dubai  A. Di Matteo, Dario Fiandaca, Antonina Pirrotta	164	Multifunctional super-fine stainless wires reinforced UHPC for smart prefabricated structures  Sufen Dong, Siqi Ding, Baoguo Han, Jinping Ou	415	A Physics-based Knowledge Transfer Approach for Modeling and Forecasting Building Energy via State Space Alignment  Zack Xuereb Conti, Ruchi Choudhary, L. Magri
15:30 - 15:50	497	High-speed 3D railroad tie deflection mapping in real-time using an array of air-coupled non-contact transducers  Diptojit Datta, Ali Zare Hosseinzadeh, Ranting Cui, F. Lanza di Scalea	195	Framework for strain measurements at cyclic loaded structures with planar elastoresistive sensors applying Electrical Impedance Tomography  Jonas Wagner, Christoph Kralovec, Daniel Kimpfbeck, Lukas Heinzlmeier, Martin Schagerl	626	Application of a SHM transfer learning strategy based on the use of speaker recognition x-vectors  Eleonora M. Tronci, Raimondo Betti, Homayoon Beigi, M. Q. Feng
15:50 - 16:10	621	Phenomenological-behavioral method for modelling of vibration signals  Tomasz Barszcz, A. Jablonski	206	Impedancemetry for cure monitoring and SHM of CFRP  Huikangyue BAO, P. Marguerès, P. Olivier		
16:10 - 16:30	Coffee Break					

Monday - Day 1

Aule Polo Didattico - Building 19

	Aula 6			Aula 7			Aula 8		
SESSION	Machine learning and modelling in SHM			Robust Statistical and Probabilistic Methods for SHM			General Session		
SESSION CHAIRS	Abhishek Kundu and Carol Featherston (Cardiff University, UK)			John Sakellariou (University of Patras, Greece)			Marco Lo Cascio and Vincenzo Gulizzi (University of Palermo)		
14:30 - 14:50	96	Adding autonomy to robotic enabled sensing	Carmelo Mineo, Donatella Cerniglia	450	On Random Vibration Based Robust Damage Detection for a Population of Composite Aerostructures Under Variable and Non-Measurable Excitation	Ioannis Saramantas, John Sakellariou, Spiliotis Fassois	130	Evaluating Audible Acoustics as a Damage Detection Method in Large Composite Structures	Marwan Naaman, Matthew Pearson, Rhys Pullin, Faisal Almudaihesh, S. Grigg
14:50 - 15:10	124	Identification of Characteristic Parameters in Material Property Random Field of a Damaged Rectangular Plate by Bayesian Inference	Qi chen, D. Kennedy, Abhishek Kundu	481	On the detection of incipient faults in rotating machinery under different operating speeds using unsupervised vibration-based statistical time series methods	D. Bourdalos, Ilias Iliopoulos, John Sakellariou	132	Input Extraction in a Class of Nonlinear Systems	Dionisio Bernal, Martin Ulriksen
15:10 - 15:30	126	AI-based anomaly detection in vibration signals for structural health monitoring of an offshore wind turbine	Yacine Bel-Hadj, W. Weijtjens	489	A multi-stage machine learning methodology for health monitoring of largely unobserved structures under varying environmental conditions	Alireza Entezami, Stefano Mariani, Hashem Shariatmadar	150	Low-Power Actuation Methods for Highly Nonlinear Solitary Wave Transducers used to Assess Human Eyes	Madison Hodgson, Samuel Dickerson, Piervincenzo Rizzo
15:30 - 15:50	136	Dispersion Behaviour Analysis in Composite Structures using Semi-Analytical Finite Element Method	Taha Aburakhis, Shirsendu Sikdar, Abhishek Kundu	551	Gaussian Process strain pre-extrapolation and uncertainty estimation for inverse Finite Elements	Dario Poloni, D. Oboe, Claudio Sbarufatti, M. Giglio	157	Numerical and experimental study of acoustic emission source signal reconstruction in fibre reinforced composite panels	Arnaud Huijjer, Christos Kassapoglou, Pooria Pahlavan
15:50 - 16:10	172	Global Health Assessment of Structures Using NDT and Machine Learning	Sreevalli Yeliseti, Rakesh Katam, Prafulla Kalapatapu, Venkata Dilip Pasupuleti	623	Pre-posterior analysis of temperature-compensated structural health monitoring data	Valeria Caspani, Daniel Tonelli, F. Poli, Stefano Zorzi, D. Zonta	185	Damage detection and identification in composites by acoustic emission, ultrasonic inspection and computer tomography	M. Scheerer, Zoltan Simon, M. Marischler, Sascha Senck
16:10 - 16:30	Coffee Break								

	Aula 9		Aula 10		Aula 11	
SESSION	Damage detectability and effects of environmental and operational variability in SHM		Vehicle-based Indirect SHM for Infrastructure		Guided Waves in Structures for SHM	
SESSION CHAIRS	D. García Cava (The University of Edinburgh, UK) and D. Avendáno Valencia (University of Southern Denmark)		Chul-Woo Kim (Kyoto University) and Yongbin Yang (National Taiwan University)		Annamaria Pau (Sapienza University of Rome, Italy) and Margherita Capriotti (San Diego State University, USA)	
14:30 - 14:50	54	Model Assisted Probability of Detection using a Digital Clone Platform for Composite Structures  Ilias Giannakeas, Zahra Sharif Khodaei, Ferri Aliabadi	175	Damage detection and localization for indirect bridge monitoring exploiting adversarial autoencoder and wavelet transform  Kirandeep Kaur, Mehri Alamdari, Kai-Chun CHANG, Chul-Woo Kim, Elena Atroshchenko	75	Influence of operational and environmental conditions on Lamb wave signals  Ondrej Vích, Lenka Šedková
14:50 - 15:10	80	A Novel Approach for Preload Monitoring In Bolted Connections Using Electro-Mechanical Impedance Spectra  Anna-Lena Dreisbach, Claus-Peter Fritzen	248	A contribution to a better understanding of the variability of bridge deck vibrations due to traffic loading  Eliz-Mari Lourens, Floris Besseling	76	Use of deep learning techniques for damage localization in aeronautical composite structures  Guillermo Azuara, M.no Ruiz, Eduardo Barrera, Ranting Cui, F. Lanza di Scalea
15:10 - 15:30	81	Closed-loop damage-locating vectors  Martin Jepsen, Martin Ulriksen, Dionisio Bernal	334	Structural Health Monitoring of Bridges using Dynamic Vehicle Force  Souichirou Hasegawa, Yukihiro Yano, Chul-Woo Kim, Kai-Chun CHANG	85	Temperature and damage-affected Lamb wave signals in composite sandwich plate  Lenka Šedková, Ondrej Vích
15:30 - 15:50	100	Monitoring of Crack Growth in Advanced Adhesively Bonded Joints using Acoustic Emission  Thomas Wolfsgruber, Martin Schagerl, Stefan Sieberer	377	Fundamental study on extracting vibration of pole structures from a video footage  Daigo Kawabe, Chul-Woo Kim	88	Displacement field analysis of guided ultrasonic waves in fiber metal laminates by numerical 2D and 3D modeling  Andrey Mikhaylenko, Natalie Rauter, Rolf Lammering
15:50 - 16:10	105	Impedance-Based SHM with High Frequency Excitation Signals of Variable Amplitude and Duration  Danilo Budoya, Leandro Campeiro, Fabricio Baptista	381	The behavior analysis of Spatial Singular Mode Angle due to addition of noise to the data in an actual bridge experiment  Yuta Takahashi, Naoki Kaneko, Ryota Shin, Kyosuke Yamamoto	137	Embedded Surface Acoustic Wave-based Structural Health Monitoring for Additive Manufacturing  Michaël Hinderdael
16:10 - 16:30	Coffee Break					

		Aula12	
SESSION	Structural assessment and health monitoring of the built-up environment with satellite radar interferometry: methodologies and applications		
SESSION CHAIRS	A. Miano (University of Naples, Deferico II) and M. Bonano (CIRA-IREA, Italy)		
14:30 - 14:50	374	Land subsidence associated with illegal mining activities in Zaruma – Ecuador, a cultural heritage cite.	Chester Sellers, LORENZO AMMIRATI, Mohammad Amin Khalili, Sandra Bujan, Ricardo Rodas, Diego Di Martire
14:50 - 15:10	414	PS ToolBox: a new GIS suite for the post-processing of InSAR data	A. Brunetti, Niccolò Belcecchi, M. Gaeta, S. Giraldo Manrique
15:10 - 15:30	425	Titan4 Persistent Scatterer Interferometry for Structural Health Monitoring	Pia Addabbo, Francesco Cruciani, Stefano Cruciani, Giovanni Quacquarelli
15:30 - 15:50	441	Multi-temporal satellite interferometric SAR data processing for monitoring deformation phenomena over the built-up environment	M. Bonano, R. Lanari, Sabatino Buonanno, M. Manunta, Pasquale Striano, Muhammad Yasir, Ivana Zinno
15:50 - 16:10	446	Structural monitoring of a masonry hydraulic infrastructure in Rome: GIS integration of SAR data, geological investigation and historical surveys	A. Mele, I. Giannetti, M. Rompato, M. Bonano, F. Bozzano, F. Di Carlo, R. Lanari, P. Mazzanti, A. Meda, A. Miano, N. Nappo, A. Prota, G. Scarascia Mugnozza
16:10 - 16:30	Coffee Break		



	Aula 3		Aula 4		Aula 5
<b>SESSION</b>	<b>SHM and Digital Twins of historical structures.</b>		<b>SHM of engineering structures using smart multifunctional materials and systems</b>		
<b>SESSION CHAIRS</b>	<b>Carlo Rainieri (CNR- c/o Polo Tecnologico di San Giovanni a Teduccio, Napoli)</b>		<b>Filippo Ubertini (University of Perugia)</b>		
<b>16:30 - 16:50</b>	<b>3</b>	The decaying of the first natural frequencies of the Santa M. di Collemaggio basilica from three years of monitoring  Angelo Aloisio, R. Cirella, Elena Antonacci, Rocco Alaggio	<b>252</b>	Interface Engineering of Embedded Mechanoluminescence-Perovskite Self-Powered Pressure Sensor for Improved Performance  L.s Braga Carani, Vincent Obiozo Eze, Okenwa Okoli	
<b>16:50 - 17:10</b>	<b>151</b>	Hierarchical Gaussian Processes for digital twin implementation of maglev trains  Shuo Hao, Su-Mei Wang, Yi-Qing Ni	<b>272</b>	Strain sensors for biaxial loads. Comparative response of electrical strain gages, fiber bragg gratings and cnt doped resins  Alfredo Güemes, Xoan Xosé Fernández Sánchez-Romate	
<b>17:10 - 17:30</b>	<b>484</b>	Development of the digital twin of a historical structure for SHM and maintenance  Carlo Rainieri, Ilenia Rosati, Luigi Cieri, Giovanni Fabbrocino	<b>364</b>	Smart Bricks for Monitoring Strain in Full-Scale Masonry Structures: Recent Advances and First Field Application  A. Meoni, A. D'Alessandro, Giorgio Virgulto, N. Buratti, Filippo Ubertini	
<b>17:30 - 17:50</b>	<b>507</b>	Fatigue Performance Prediction of a Gusset-less Truss Connection in A Vertical Lift Bridge  Erin Bell	<b>388</b>	3D Electrical Resistance Tomography for Localizing Damage in Skin-covered Lattice Structures  Yening Shu, Saptarshi Mukherjee, Tammy Chang, Joseph Tringe, D. Stobbe, Kenneth Loh	
<b>17:50 - 18:10</b>					
<b>20:00 - 22:00</b>	Welcome cocktail: Orto Botanico				

	Aula 6			Aula 7			Aula 8		
<b>SESSION</b>	<b>Machine learning and modelling in SHM</b>						<b>General Session</b>		
<b>SESSION CHAIRS</b>	Abhishek Kundu (Cardiff School of Engineering, Cardiff University, UK) and Carol Featherston (Cardiff School of Engineering, Cardiff University, UK)						Marco Lo Cascio and Vincenzo Gulizzi (University of Palermo)		
<b>16:30 - 16:50</b>	<b>173</b>	A Review on Technological Advancements in the Field of Data Driven Structural Health Monitoring	Rakesh Katam, Prafulla Kalapatapu, Venkata Dilip Pasupuleti				<b>236</b>	Condition Assessment of Low-speed Slew Bearings in Offshore Applications Using Acoustic Emission Monitoring	Bart Scheeren, Poooria Pahlavan
<b>16:50 - 17:10</b>	<b>199</b>	Deep Learning Framework for Automatic Identification of Impact and Damage Sources in a Composite Structure	Shirsendu Sikdar, Abhishek Kundu				<b>237</b>	Influence of environmental conditions and damage on closely spaced modes	Clemens Jonscher, Benedikt Hofmeister, Tanja Griebmann, Raimund Rolfes
<b>17:10 - 17:30</b>	<b>251</b>	Physical covariance functions for dynamic systems with time-dependent parameters	Matthew Jones, Timothy Rogers, Elizabeth Cross				<b>238</b>	Thin membrane with Human touch" sensitivity: body pressure and temperature measurements with optical fiber sensors	F. Spini, Daniela Rigamonti, P. Bettini, P. Tagliabue, L. Di Landro
<b>17:30 - 17:50</b>	<b>276</b>	Damage Assessment of a UAV Wing Spar Using Gaussian Process Regressors	Adrielly Hokama Razzini, M. Todd, Iddo Kressel, Yoav Ofir, Tur Moshe, Tal Yehushua				<b>239</b>	Enabling FO-based HUMS applications through an innovative integration technique: application to a rotor blade mockup	Daniela Rigamonti, P. Bettini
<b>17:50 - 18:10</b>							<b>227</b>	Modelling of self-sensing hybrid composites for detection of barely visible impact damage	Sakineh Fotouhi, Mohammad Mahdi Ashrafiyan, Meisam Jalalvand, Amin Farrokhbadi, Mohammad Fotouhi, M. R Wisnom
<b>20:00 - 22:00</b>	Welcome cocktail: Orto Botanico								

	Aula 9		Aula 10		Aula 11	
SESSION	Damage detectability and effects of environmental and operational variability in SHM		Vehicle-based Indirect SHM for Infrastructure		Guided Waves in Structures for SHM	
SESSION CHAIRS	D. Garcia Cava (The University of Edinburgh, UK) and D. Avendãno Valencia (University of Southern Denmark)		Hae Young Noh (Stanford University, USA) and Abdollah Malekjafarian (University College Dublin)		Dimitris Saravanos (University of Patras, Greece) and Fabrizio Ricci (University of Naples, Italy)	
16:30 - 16:50	135	Thermal cycling durability of bonded PZT transducers used for the SHM of reusable launch vehicles  Loïc MastroM., Ludovic Gaverina, Florian Lavelle, Jean-Michel Roche, François-Xavier Irisarri	421	A data-driven approach for railway track monitoring using vehicle-based measurements  Abdollah Malekjafarian, C.-Antoine Sarrabezolles, Fatemeh Golpayegani	192	A Large-scale and Lightweight Piezoelectric Sensor Network with Shared Signal Transmission Wires for Aircraft Structural Health Monitoring Smart Skin  Yu Wang, lei qiu, Shuguang Hu, Chongqi Wang
16:50 - 17:10	210	Influence of Intermediate Hinge Damage on Bridge Response and Modal Parameters of Cantilever-Suspended Girder Bridge  Aoi Hiraoka, Gen Hayashi, Takashi Yamaguchi	454	Effects of operational traffic variability on iSHM  Richard May	155	Guided Waves benchmark dataset and classifier comparison  Ziemowit Dworakowski, Mateusz Heesch, Michal Dziendzikowski, Jakub Gorski
17:10 - 17:30	259	Estimation of Inputs in Systems with Localized Nonlinearities of Unknown Position  Jiarong Chen, Dionisio Bernal	468	Weld condition monitoring using expert informed Extreme Value Analysis  Cyprien Hoelzl, V. Dertimanis, Lucian Ancu, Aurelia Kollros, Eleni Chatzi	174	Dual Mode Inspection Using Guided Waves and Phased Array Ultrasonics from a Single Transducer  K.Tzaferis, M. Tabatabaeipour, G. Dobie, S. Pierce, D. Lines, C. N. MacLeod, A.Gachagan
17:30 - 17:50	268	Damage Detection Using Refined Time Reversal Method of Lamb Waves Under Varying Temperatures  Bhabhagrahi Natha Sharma, Santosh Kapuria, A. Arockiarajan	487	Vehicle-based Indirect SHM of an Austrian Railway Bridge: Simulation and In-situ Test  M. Reiterer, Lara Bettinelli, A.S Stollwitzer, Janez Schellander, Josef Fink	176	Enhanced simulation of guided waves and damage localization in composite strips using the Multi-resolution finite wavelet domain method  Dimitris Dimitriou, Christos Nastos, Dimitris Saravanos
17:50 - 18:10	320	Data driven damage detection strategy under uncontrolled environment  F. Lucà, Stefano Manzoni, Alfredo Cigada	614	Bridge Damage Detection Using Inertial Readings from a Fleet of Vehicles  Eugene OBrien, Yifei Ren, Jennifer Keenahan		
20:00 - 22:00	Welcome cocktail: Orto Botanico					

		Aula12	
SESSION	Space-borne health monitoring for civil infrastructure		
SESSION CHAIRS	Giorgia Giardina (Delft University of Technology, The Netherland) and P. Miliilo (University of Houston, USA)		
16:30 - 16:50	313	Early warning system for the detection of unexpected bridge displacements from InSAR data	Cristian Rossi, Daniel Cusson
16:50 - 17:10	330	A new tool for road network deformations monitoring through space-born SAR data and in-situ instruments	P. Miele, Gerardo Di Martino, M. Rella Riccardi, Alfonso Montella, Diego Di Martire
17:10 - 17:30	361	Integrated use of Space-Born Data for SHM of an Ancient Infrastructure	Stefania Coccimiglio, Giorgia Coletta, Erica Lenticchia, Gaetano Miraglia, Rosario Ceravolo
17:30 - 17:50	366	Remote sensing satellite data and progressive collapse analysis for structural monitoring of multispan bridges	Elisabetta Farneti, N. Cavalagli, Mario Costantini, F. Trillo, F. Minati, I. Venanzi, Filippo Ubertini
17:50 - 18:10			
20:00 - 22.00	Welcome cocktail: Orto Botanico		

**Aula Magna - Plenary Auditorium - Building 7**  
**Chair: Dr. A. Milazzo**

<p><b>09:00 - 09:50</b></p>	<p>Keynote 2:  <b>DR. ELIZABETH CROSS</b>                  (University of Sheffield, UK), Physics-informed machine learning for SHM</p>	
<p><b>09:50 - 10:20</b></p>	<p>Invited 3:  <b>DR. MARCO PROTTI</b>                  (VP of Advanced Research of Leonardo Aircraft Division and Sustainability Coordinator, Italy),                  Structural Health Monitoring – perspective for the future generation of aircraft</p>	
<p><b>10:20 - 10:50</b></p>	<p>Invited 4:  <b>DR. DANILO PAU</b>                  (Technical Director, IEEE &amp; ST Fellow – System Research and Applications, STMicroelectronics S.r.l., Italy),                  On device machine learning computing for constrained monitoring</p>	

**Tuesday - Day 2**

**Aule Polo Didattico - Building 19**

10:50 - 11:30		Coffee Break							
		Aula 3		Aula 4		Aula 5			
SESSION	Civil SHM Based on Data Science Techniques		Verification & Validation approaches for Demonstrating the Value of SHM		Integrated approaches for SHM: models, data and experiments				
SESSION CHAIRS	Filippo Ubertini and Ilaria Venanzi (University of Perugia)		Eleni Chatzi and Yves Reuland (ETH)		Dr. Alice Cicirello (Delft University, The Netherlands)				
11:30 - 11:50	23	Long-term dynamic strain monitoring of the Nieuwebrugstraat railway bridge: influence of damage vs. temperature	D. Anastasopoulos, Guido De Roeck, Edwin Reynders	117	Damage diagnostics on post-buckled stiffened panels utilizing the digital-twin concept	D. Milanoski, G. Galanopoulos, D. Zarouchas, T. Loutas	11	SHM/NDE Research at Laboratory of Active Materials and Smart Structures	Victor Giurgiutiu
11:50 - 12:10	93	Data-based Prognosis and Monitoring of Civil Infrastructures	Mohammad Shamim Miah, Werner Lienhart	146	Train-track-bridge interaction analytical model with non-proportional damping: sensitivity analysis and experimental validation	M. Martino Rosso, Angelo Aloisio, Raffaele Cucuzza, G. Carlo Marano, Rocco Alaggio	89	Integration of Fatigue Estimation into Experimentable Digital Twins for Structural Applications	Sebastian Schmid, Rebecca Richstein, Kai-Uwe Schröder
12:10 - 12:30	159	Damage detection using supervised machine learning algorithms for real-world engineering structures	Simone Turrisi, Emanuele Zappa, Alfredo Cigada, Songshitobrota Kumar	217	An SHM data-driven methodology for the Remaining Useful Life prognosis of aeronautical subcomponents	G. Galanopoulos, Nick Eleftheroglou, D. Milanoski, Agnes Broer, D. Zarouchas, T. Loutas	90	Using SHM for the representation of structural components over their service life within Digital Twins	Rebecca Richstein, Sebastian Schmid, Kai-Uwe Schröder
12:30 - 12:50	170	Classification and Detection of Various Structural Cracks Using Deep Learning Approach	Narasimha Reddy Vundekode, Prafulla Kalapatapu, Venkata Dilip Pasupuleti	257	Improving decision-making via risk-based active learning: Probabilistic discriminative classifiers	Aidan Hughes, P. Gardner, L. Bull, Nikolaos Dervilis, Keith Worden	99	Crack size estimation with an inverse Finite Element Model	D. Oboe, Dario Poloni, Claudio Sbaruffati, M. Giglio
12:50 - 13:10	184	Long-term structural monitoring of an offshore jacket steel platform. Validation of meteo-marine parameters and implications for maintenance	M. Betti, P. Castelli, Luciano Galano, Ostilio Spadaccini, Giacomo Zini	284	Cross-Correlation Based Algorithm for SHM De-Bonding Analysis of Typical Aeronautical Structures via OFDR	Monica Ciminello	104	Implementation of SHM systems in automotive components: monitoring of adhesive joints with dissimilar materials	A. Calvo-Echenique, Said El Kadmiri, Emmanuel Duvivier, Antoine Latour, Onur Sinak, Clara Valero, Agustín Chiminelli
13:10 - 13:30									
13:10 - 14:30	Lunch Break								

10:50 - 11:30				Coffee Break					
		Aula 6		Aula 7		Aula 8			
SESSION		Machine learning and modelling in SHM		Real time monitoring of built infrastructure		General Session			
SESSION CHAIRS		Wieslaw Ostachowicz (Polish Academy of Sciences, Poland)		Vikram Pakrashi and Basuraj Bhowmik (University College Dublin, Ireland)		Ivano Benedetti and Marco Lo Cascio (University of Palermo)			
11:30 - 11:50	315	Mitigating sampling bias in risk-based active learning via an EM algorithm	Aidan Hughes, L. Bull, P. Gardner, Nikolaos Dervilis, Keith Worden	56	Application of the Instantaneous Rényi Entropy for Real-time Damage Detection.	M. Civera, Erica Lenticchia, Gaetano Miraglia, Rosario Ceravolo, Cecilia Surace	285	Estimation of local failure in large tensegrity structures via substructuring using Interacting Particle-Ensemble Kalman Filter	Neha Aswal, Subhamoy Sen, Laurent Mevel
11:50 - 12:10	307	Intelligent health indicators based on semi-supervised learning utilizing acoustic emission data	M. Moradi, Agnes Broer, J. Chiachio, R. Benedictus, D. Zarouchas	62	A Critical Look at use of Wavelets in Damage Detection	Mohammadreza Salehi, Semih Gonen, Erduran Emrah	295	Optical fiber sensor integration in structures exploiting additive manufacturing technologies	A. Airoidi, P. Bettini, Lorenzo Cartabia, Sara Zabizadeh, Felix Reinert, Sara Ghiasvand, Daniela Rigamonti, Massoud Dadras, Olha Sereda
12:10 - 12:30	308	Merging modelling and data-driven learning for identification of damages in composites	Abhishek Kundu	106	Development of Limits and Long-term Monitoring of Highly Sensitive Equipment	Elisabetta Pistone, Hanno Töll, Günther Achs	316	Spherical inclusions based defect modes in a phononic crystal for piezoelectric energy harvesting	Subrahmanyam Gantasala, Tiju Thomas, Prabhu Rajagopal
12:30 - 12:50	294	On the Application of Partial Domain Adaptation for PBSHM	Jack Poole, P. Gardner, Nikolaos Dervilis, L. Bull, Keith Worden	118	Dynamic Monitoring of a Cable-Stayed Bridge: Monitoring System and First Results	Sérgio Pereira, Filipe Magalhães, Elsa Caetano, Álvaro Cunha, Thibaud Toulhier, Jean Dumoulin	358	Low Flow Rate Measurement and Leak Detection for Health Monitoring of Water Equipment	Armin Yazdi, Li-Chih Tsai, Maysam Rezaee, Sarang Gore, Nathan Salowitz
12:50 - 13:10	324	Supervised deep learning algorithms for delaminations detection on composites panels by wave propagation signals analysis	Ernesto Monaco, Natalino D. Boffa, Fabrizio Ricci	122	The Genoa San Giorgio Bridge Fiber-optic Structural Monitoring System	F. Piastra, Giovanni Cusano, Giulio Ventura, Bruno Griffoni, Justin Stay, D. Costantini	389	Frequency Domain System Identification of Error-in-Variates Systems for Vibration-based Monitoring	F. Zonzini, P. Castaldi, L. De Marchi
13:10 - 13:30									
13:10 - 14:30				Lunch Break					

**Tuesday - Day 2**

**Aule Polo Didattico - Building 19**

10:50 - 11:30				Coffee Break					
		Aula 9		Aula 10		Aula 11			
SESSION		Damage detectability and effects of environmental and operational variability in SHM		Optical and computer-vision techniques for SHM & NDT		Guided Waves in Structures for SHM			
SESSION CHAIRS		D. García Cava (The University of Edinburgh, UK) and D. Avendaño Valencia (University of Southern Denmark)		Alessandro Sabato (University of Massachusetts, Lowell, USA)		Annamaria Pau (Sapienza University of Rome, Italy) and Ralf Lammering (Helmut-Schmidt-Universität, Germany)			
11:30 - 11:50	363	Simulation of an SHM system based on piezoelectric sensors for loaded and damaged composite component	Donato Perfetto, A. De L., G. Lamanna, Aldo Minardo, Raffaele Vallifuoco, F. Caputo	47	Advancements in Structural Health Monitoring Using Combined Computer-Vision and Unmanned Aerial Vehicles Approaches	A. Sabato, C. Niezrecki, Shweta Dabetwar, Nitin Nagesh Kulkarni, F. Bottalico, Tymon Nieduzak	203	Fully Integrated Hybrid "Piezoelectric/Fiber Optic" Acousto-Ultrasound Sensor Network (FAULSense™) SHM System	Edgar Mendoza
11:50 - 12:10	393	Fatigue crack monitoring of metal aircraft structures with the use of the integrated eddy current sensors	Kamil Kowalczyk, Michal Dziendzikowski, Patryk Niedbala, Krzysztof Dragan	120	Totalite: a novel optical sensing system for contactless deformation monitoring	Edo Noordermeer, Dennis van Weeren, Arnoud Jongsma, N.s Buggenhout, Mario de Bijl	233	Damage size quantification using Lamb waves by analytical model identification	William Briand, Marc Rebillat, Mikhail Guskov, Nazih Mechbal
12:10 - 12:30	423	Towards a meaningful definition of damage detectability for SHM	L. D. Avendaño-Valencia	148	Vibration Frequency-Based Optimal Baseline Selection for Damage Detection in SHM	A. Machynia, Jakub Spytek, Kajetan Dziedzic, Krzysztof Holak, Ziemowit Dworakowski	247	Damage detection on a curved composite stiffened panel based on ultrasonic guided waves	F. de Sá Rodrigues, Zahra Sharif Khodaei, Ferri Aliabadi
12:30 - 12:50	482	SHM for assets like pressure vessels and pipes for oil and gas applications regarding corrosion under insulation	Robert Neubeck, Mareike Stephan, T. Gaul, Bianca Weinhacht, Lars Schubert, Arne Ulrik Bindingsbø, Jan-Magnus Østvik	153	Aligned Marker Space for vision-based detection of damage in structures with one fixed end	Ziemowit Dworakowski, Pawel Zdziebko, Kajetan Dziedzic, Krzysztof Holak	269	Efficient layerwise time-domain spectral finite element for guided wave propagation analysis of multi-layered panels	Mayank Jain, Santosh Kapuria
12:50 - 13:10	505	Structural Damage Identification from Video Footage using Artificial Intelligence	Sree Keerthe Beeram, Sushmita Kadarla, Prafulla Kalapatapu, Venkata Dilip Pasupuleti	196	Durability in alkaline environment of a fiber optic sensor bonded at the surface of reinforcing bars and intended for distributed strain measurements in concrete structures	Noemie Delaplanque, Sylvain Chataigner, Laurent Gaillet, Marc Quiertant, karim benzarti, Arnoud Rolland, Xavier Chapeleau, Alvaro Saravia Flores	270	A Bayesian Approach to Lamb-Wave Dispersion Curve Material Identification in Composite Plates	Marcus Haywood-A., Nikolaos Dervilis, Keith Worden, Timothy Rogers
13:10 - 13:30									
13:10 - 14:30								Lunch Break	



		Aula12	
SESSION	Space-borne health monitoring for civil infrastructure		
SESSION CHAIRS	Giorgia Giardina (Delft University of Technology, The Netherland) and Pietro Milillo (University of Houston, USA)		
11:30 - 11:50	340	Automated satellite monitoring of roadways and bridges over a regional scale	V. Macchiarulo, P. Milillo, Giorgia Giardina
11:50 - 12:10	398	Multi-resolution/multi-frequency Satellite In-SAR for Structural Health Monitoring	Stefano Scancelli, P. Mazzanti, Niccolò Belcecchi
12:10 - 12:30	536	The use of MT-DInSAR data for the safety assessment and monitoring of structures and infrastructures: the case study of "Torri Stellari" in Rome	A. Miano, A. Mele, M. Bonano, F. Di Carlo, R. Lanari, M. Manunta, A. Meda, A. Prota, Anna Saetta, A. Stella, Diego Talledo
12:30 - 12:50	558	Monitoring of a metal bridge using DInSAR data	Pier F. Giordano, Mattia Previtali, M. Pina Limongelli
12:50 - 13:10			
13:10 - 14:30	Lunch Break		

	Aula 3		Aula 4		Aula 5	
SESSION	Civil SHM Based on Data Science Techniques		Verification & Validation approaches for Demonstrating the Value of SHM		Integrated approaches for SHM: models, data and experiments	
SESSION CHAIRS	Filippo Ubertini and Ilaria Venanzi (University of Perugia)		Antonis Kamariotis (Technical University of Munich) and Eleni Chatzi (ETH, Switzerland)		Dr. Cecilia Surace (Politecnico of Turin, Italy)	
14:30 - 14:50	219	Deep autoencoders for unsupervised damage detection with application to the Z24 benchmark bridge  V. Giglioni, I. Venanzi, Alina Elena Baia, V. Poggioni, Alfredo Milani, Filippo Ubertini	305	Experimental demonstration of Structural Health Monitoring design map for an airborne primary structure  Iddo Kressel, Yoav Ofir, Uri Ben-Simon, Shay Shoham, Jonathan Bohbot, Moshe Tur	612	Composite and monolithic DFOS sensors for load tests and long-term structural monitoring of road infrastructure  Rafał Siefiko, Łukasz Bednarski, Tomasz Howiacki, Katarzyna Zuziak
14:50 - 15:10	260	Exploiting sparseness in damage characterization: A close look at the regularization techniques  Esmaeil Memarzadeh, Dionisio Bernal, Martin Ulriksen	322	Adaptive multi-category train scheduling validation based on fatigue reliability of a long-span suspension bridge  Zhen Sun, Elsa Caetano, João Santos	141	Shape sensing of stiffened plates using inverse FEM aided by virtual strain measurements  Rinto Roy, M. Esposito, Cecilia Surace, M. Gherlone, A. Tessler
15:10 - 15:30	262	Bayesian-based fusion of monitoring data and visual inspections in monumental structures  L. Ierimonti, I. Venanzi, N. Cavalagli, Enrique García Macías, Filippo Ubertini	328	SHM data-driven prognostics: the ultimate level of SHM  T. Loutas, D. Zarouchas	144	Concrete bridges continuous SHM using MEMS sensors: anomaly detection for preventive maintenance  F. Basone, Alfredo Cigada, P. Darò, G. Lastrico, Monica Longo, G. Mancini
15:30 - 15:50	291	A deep neural network, multi-fidelity surrogate model approach for Bayesian model updating in SHM  M. Torzoni, A. Manzoni, Stefano Mariani	353	Quantifying the value of vibration-based structural health monitoring considering environmental variability  A.s Kamariotis, Eleni Chatzi, Daniel Straub	177	Mechanics informed approach to online prognosis of composite airframe element: stiffness monitoring with SHM data and data-driven RUL prediction  Nan Yue, G. Galanopoulos, T. Loutas, D. Zarouchas
15:50 - 16:10	304	Structural condition identification using roaming damage method  Ricardo Perera, A. Carnicero, Sean Sandercock	426	Measuring dynamic response of the Wilford suspension bridge with a vision-based measurement system: a case study  Rolands Kromanis, Said Elias Rahimi	186	A performance metric to evaluate frequency-based damage indicators  Josep Font-Moré, M. A. Pérez
16:10 - 16:30	Coffee Break					

	Aula 6		Aula 7		Aula 8	
SESSION	Machine learning and modelling in SHM		Real time monitoring of built infrastructure		General Session	
SESSION CHAIRS	Abhishek Kundu (Cardiff University, UK) and Wieslaw Ostachowicz (Polish Academy of Sciences, Poland)		Vikram Pakrashi (University College Dublin, Ireland)		Ivano Benedetti and Donatella Cerniglia (University of Palermo)	
14:30 - 14:50	336	Deep Learning using Solitary Waves for Defect Detection in Composite  Tae-Yeon Kim, Sangyoung Yoon, Chan Yeob Yeun, Wesley Cantwell, Chung Suk Cho	129	Combination of total station and GNSS for the monitoring of civil infrastructures in dense urban areas  Gauthier Magnaval, Thibault Colette, Mouaad Boumeshal	418	Development of computationally efficient health benchmarking approach for a bridge structure by coupling substructuring technique within interacting filtering approach  Eshwar Kuncham, Subhamoy Sen
14:50 - 15:10	354	Nonlinear reduced order modelling of Soil Structure Interaction Effects via LSTM and Autoencoder Neural Networks  Thomas Simpson, Nikolaos Dervilis, P,pe Couturier, Nico Maljaars, Eleni Chatzi	147	Bridge monitoring using vehicle-induced vibration  Said Quqa, Othmane Lasri, L. Landi	435	Real-Time Remote Monitoring of Steam Turbine Blades based on High Cycle Fatigue Module and Cloud Computing  Jindrich Liska, Jan Jaki, Vojtech Vasicek, Tomas Misek, Vaclav Polreich
15:10 - 15:30	392	Machine learning based classification of guided wave signals in the context of inter-specimen variabilities  Vivek Nerlikar, Olivier Mesnil, R. Miorelli, O. D'Almeida	169	A semi-supervised framework for robust detection and characterization of structural damage  Panagiotis Martakis, Yves Reuland, Eleni Chatzi	466	Numerical Modeling of a Pyroshock Test Plate for Qualification of Space Equipment  L. Viale, A. Daga, Luigi Garibaldi, A. Fasana
15:30 - 15:50	412	Bayesian Change-point Modelling for Reference-Free Damage Detection with Acoustic Emission Data  Ru Scott, Matthew Jones, Timothy Rogers	171	Combined Bridge Weigh-In-Motion and Structural Health Monitoring on Road Bridges: Case Study on the Salso Viaduct (Italy)  François-B. Cartiaux, Valeria Fort, Patrice Pelletier, Bernard Jacob, Alexandre Brouste	471	A Novel Smart Sensor Node with Embedded Signal Processing Functionalities Addressing Vibration-based Monitoring  M. Zauli, F. Zonzini, Valerio Coppola, V. Dertimanis, Eleni Chatzi, N. Testoni, L. De Marchi
15:50 - 16:10	430	A Physics-guided Deep Learning Approach to Modeling Nonlinear Dynamics: a case study of a Bouc-Wen System  Wei Liu, Zhilu Lai, Eleni Chatzi	188	Fibre optic monitoring systems in the Cambridge University Civil Engineering Building  Nicholas de Battista, Miguel Bravo-Haro, Cedric Kechavarzi	478	Defects identification in a train wheel by wavelet analysis of laser ultrasonic signals: a preliminary study  Gabriella Epasto, N. Montinaro, Donatella Cerniglia, Eugenio Guglielmino
16:10 - 16:30	Coffee Break					

	Aula 9		Aula 10		Aula 11	
<b>SESSION</b>	Damage detectability and effects of environmental and operational variability in SHM		Optical and computer-vision techniques for SHM & NDT		Guided Waves in Structures for SHM	
<b>SESSION CHAIRS</b>	D. García Cava (The University of Edinburgh, UK) and D. Avendaño Valencia (University of Southern Denmark)		Alessandro Sabato (University of Massachusetts, Lowell, USA)		Francesco Lanza di Scalea (UC San Diego, USA) and Guillermo Azuara de Pablo (Universiada Politecnica de Madrid, Spain)	
14:30 - 14:50	562	Structure-bonded flexible eddy current coils for in-situ crack monitoring  Catalin Mandache	329	Experimental approach for the detection of defects employing high-resolution Digital image correlation.  L. Felipe-Sesé, Ángel Jesús Molina-Viedma, Manuel Pastor-Cintas, A. Carrasco-Morillas, Elías López-Alba, F. Díaz-Garrido	283	Damage Detection Based on Voltage Transfer Ratio Approach and Bayesian Classifier  Michał Dziendzikowski, Mateusz Heesch, Jakub Gorski, Krzysztof Dragan, Ziemowit Dworakowski
14:50 - 15:10	573	Detecting bending and impact events in a fiber optic cable using Distributed Acoustic Sensing to assess potential offshore power cable damages  Jasper Ryvers, Manly Callewaert, Mia Loccufier, Wim De Waele	333	Camera-based Displacement Measurements using Optimal Complex Gabor Filter and Phase-based Optical Flow  SeungSeok Lee, Yinan Miao, Jun Young Jeon, Gyuhae Park	286	Automated Structural Health Monitoring of Timber Poles using Guided Wave-based Techniques  Sahan Bandara, Hendrik Wijaya, Pathmanathan Rajeev, Emad Gad
15:10 - 15:30	613	Application of nullspace-based fault detection to an aircraft structural part under changing excitation  T. Adam, Peter Kraemer	356	Damage detection in composite materials using hyperspectral imaging  Jan Długosz, Phong B. Dao, Wiesław Jerzy Staszewski, Tadeusz Uhl	297	NDE data fusion for ultrasonic guided waves-based health monitoring of impact damage in aerospace composite structures  Margherita Capriotti, Andrew Ellison, Hyungsuk E. Kim, F. Lanza di Scalea, Hyonny Kim
15:30 - 15:50	616	Simulation of Guided Waves in a CFRP Plate at a Specific Temperature  A. De Luca, Donato Peretto, F. Caputo, Zahra Sharif Khodaei, Ferri Aliabadi	410	An efficient computer vision-based method for estimation of dynamic displacements in spatial truss structures  Bartłomiej Błachowski, Mariusz Ostrowski, Mateusz Zarski, Bartosz Wojcik, Piotr Tazowski, Łukasz Jankowski	321	Structural Health Monitoring of Smart Composite Fuselage: A Building Block Approach  Nan Yue, Florian Lambinet, D. Bekas, Zahra Sharif Khodaei, Ferri Aliabadi
15:50 - 16:10	634	A Bayesian Approach to determine the Minimum Detectable Damage  Francesca Marsili, Filippo Landi, Alexander Mandler, Sylvia Keßler	527	Surface Crack Detection for Metal Panel using 2D Wavelet Transform and Local Amplitude Mapping  Seungpyo Jo, Penghua Zhang, Yinan Miao, Jun Young Jeon, Gyuhae Park	337	Detection, localization, and quantification of corrosion damage using Lamb waves for the SHM for aluminum aeronautics structures  Julie Liegey, William Briand, Marc Rebillat, Mohamed El May, Olivier Devos, Nazih Mechbal
16:10 - 16:30	Coffee Break					

	Aula 3			Aula 4			Aula 5		
SESSION	SHM and Digital Twins of historical structures.			SHM of engineering structures using smart multifunctional materials and systems			Structural assessment and health monitoring of the built-up environment with satellite radar interferometry: methodologies and applications		
SESSION CHAIRS	Carlo Rainieri (CNR- c/o Polo Tecnologico di San Giovanni a Teduccio, Napoli)			Filippo Ubertini (University of Perugia)			A. Miano (University of Naples, Deferico II) and M. Bonano (CIRA-IREA, Italy)		
16:30 - 16:50	319	A topological analysis of cointegrated data: a Z24 Bridge case study	Tristan Gowdrige, Nikolaos Dervilis, Elizabeth Cross, Keith Worden	442	In situ interfacial damage detection of flax fiber-reinforced epoxy composite-concrete bonding interface for civil engineering use	Mingfa Zhang, Xiaopeng Cui, Michelle Salvia, Bruno Berthel, Olivier Bareille	189	An influence of temperature on fiber Bragg grating sensor embedded into additive manufactured structure	Magdalena Mieloszyk, Artur A.rczyk, Katarzyna Majewska
16:50 - 17:10	342	Extraction of Single-Mode Free Responses by the Constrained Mode Decomposition Method	Jilin Hou, Dengzheng Xu, Qingxia Zhang, YaJ. Liu, Łukasz Jankowski	542	Multifunctional, smart, non-Newtonian polymer matrix with improved anti-impact properties enabling structural health monitoring in composite laminates	K. Myronidis, M. Boccaccio, M. Meo, Fulvio Pinto	225	Use of continuous optical fibres to monitor the crack propagation of adhesively bonded joints during fracture mechanic tests.	Quentin Sourisseau, Emilie Lepretre, Xavier Chapeleau, Sylvain Chataigner, Maxime Deydier, Stephane Paboeuf
17:10 - 17:30	385	Bridge health monitoring using data-driven algorithms: LSTM regression and classification approaches	Smriti Sharma, Subhamoy Sen	543	Smart fiber-based sensor systems for hydraulic engineering	Gözdem Dittel, Martin Scheurer, Thomas Gries	229	Electromagnetic-based structural health monitoring approach for tracking damage in thermoplastic welded joints	Mattia Mazzeschi, J. Carlos Merino, Esteban Cañibano, Maite Fernandez
17:30 - 17:50	545	Improved detection with impulse-response test using Time Series Modeling	Sikandar Sajid, Luc Chouinard	577	Broadband micro-gyroscope signal amplification for enhanced measurement sensitivity	Ahmed Barakat, Peter Hagedorn	232	Model-based remote health monitoring of ballast conditions in railway crossing panels	Marko Milosevic, Björn Pålsson, Arne Nissen, Håkan Johansson, Jens Nielsen
17:50 - 18:10	51	The sensitivity enhancement of the distributed fiber optical sensors	Yingwu Li, Zahra Sharif Khodaei	622	A Sensitivity Study of Different Actuators for the Electromechanical Impedance Method in 3D-Printed Material	Shishir Kumar Singh, Mohammad Ali Fakh, Pawel Malinowski	274	Experimental and numerical study of Lamb waves generation efficiency by lead zirconate titanate transducers embedded in a composite laminate	Nina Kergosien, Guillemette Ribay, Ludovic Gaverina, Florence Saffar, Pierre Beauchêne, Olivier Mesnil, Olivier Bareille
18:10 - 18:30	610	OFDR-based integral Process Monitoring and SHM system for Composites manufactured by Resin Infusion under Flexible Tooling	Valentin Buchinger, Zahra Sharif Khodaei				457	An optical fiber based track-side system for train wheels defect identification and classification	Antonio Iele, Martino Giaquinto, Armando Laudati, Roald Lengu, Luigi Carassale, Andrea Cusano
20:30 - 23:00	Street Food Festivities: Villa Filipina								

	Aula 6		Aula 7			Aula 8		
SESSION	Structural assessment and SHM of the built-up environment with satellite radar interferometry		Real time monitoring of built infrastructure			General Session		
SESSION CHAIRS	Fabio Di Carlo (Univ. of Rome Tor Vergata, Italy) and Diego Talledo (University IUAV of Venice, Italy)		Vikram Pakrashi (University College Dublin, Ireland) and Eleni Chatzi (ETH, Switzerland)			Ivano Benedetti and Donatella Cerniglia (University of Palermo)		
16:30 - 16:50	452	Satellite Interferometric Data and Perturbation Characteristics for Civil Structures at Nanohertz	Gaetano Miraglia, Erica Lenticchia, Mohamad Dabdoub, Rosario Ceravolo	350	Near-real time evaluation method of seismic damage based on structural health monitoring data	Hanqing Zhang, Yves Reuland, Eleni Chatzi, Jiazeng Shan	479	Assessment criteria for optimal sensor placement for a structural health monitoring system Tingna Wang, D. Wagg, Keith Worden, Robert Barthorpe
16:50 - 17:10	453	Integration of multi-source data to infer effects of gradual natural phenomena on structures	Erica Lenticchia, Gaetano Miraglia, Rosario Ceravolo	234	Damage Detection in Concrete slab using Smart Sounding	Deepak Kumar, Dr. Anil K. Agrawal, Dr. Ran Cao, ihan Zhan, Dr. Jie Wei	480	On robustness of optimal sensor placement to environmental variation for SHM Tingna Wang, D. Wagg, Robert Barthorpe, Keith Worden
17:10 - 17:30	463	An application of the DInSAR technique for the structural monitoring of the "Vittorino da Feltre" school building in Rome	F. Di Carlo, A. Mele, A. Miano, M. Bonano, M. Felice Pasqualina Esposito, R. Lanari, A. meda, R. Porti, A. Prota	265	Field Validation of a Tainter gate SHM system	Brian Eick, Travis Fillmore, Matthew Smith	501	Flexible Quantum Dot Solar Cell with nanostructure TiO2 photoanode with modified counter electrode. Haimanti Majumder, J. Soliz, Rigobert Ybarra, Julia Salas, Muhtasim Ul Karim Sadaf, Mohammed J Uddin
17:30 - 17:50	524	Philological building information modelling and 3D GIS for the DInSAR data-based Structural Monitoring	I. Giannetti, F. Di Carlo, A. Miano, A. Mele, A. meda, A. Prota	323	The contribution of Terrestrial SAR Interferometry for Structural Health Monitoring	Saverio Romeo, A. Brunetti, M. Baleani, P. Mazzanti	506	Ultrasonic Characterization of Biomaterials N.s Alderete, Maroun Abi Ghanem, Nicholas Boechler, Espinosa Horacio
17:50 - 18:10	535	Techniques for structural assessment based on MT-DInSAR data, applied to the San M. complex in Rome	Diego Alejandro Talledo, A. Stella, M. Bonano, F. Di Carlo, R. Lanari, M. Manunta, A. Meda, A. Mele, A. Miano, A. Prota, Anna Saetta				341	Simultaneous monitoring of component thickness and internal temperature gradient using ultrasound Yifeng Zhang, Frederic Cegla
18:10 - 18:30	598	Satellite Interferometric Data and Perturbation Characteristics for Civil Structures at Nanohertz	Gaetano Miraglia, Erica Lenticchia, Mohamad Dabdoub, Rosario Ceravolo					
20:00 - 23:00	Street Food Festivities: Villa Filippina							

	Aula 9	Aula 10		Aula 11	
SESSION		Optical and computer-vision techniques for SHM & NDT		Guided Waves in Structures for SHM	
SESSION CHAIRS		Alessandro Sabato (University of Massachusetts, Lowell, USA)		Bastien Chapuis (Université Paris-Saclay, France) and Anna Castellano (University of Bari, Italy)	
16:30 - 16:50		572	Digital twins as testbeds for vision-based post-earthquake inspections of buildings  Vedhus Hoskere, Yasutaka Narazaki, Billie F. Spencer Jr.	346	Advanced Integrated Platform for Ultrasonic Guided Waves Based Structural Health Monitoring  Guillermo Azuara, Jose Carlos Ocaña, A. Alcaide, M. Ruiz, A. Carpeño, Eduardo Barrera, Jose L. Arcas
16:50 - 17:10		591	Measuring Thermal Response of Bridges using Vision-Based Technologies and LVDTs  Sushmita Borah, Amin Al-Habaibeh, Rolands Kromanis	348	Development of GUI based tool for the visualization of the FBG spectrum subjected to Guided waves  Kaleeswaran Balasubramaniam, Rohan Soman, Pawel Malinowski
17:10 - 17:30		611	Vision-based force identification in the time domain  Krzysztof Mendrok	78	Determination of a notch depth using ultrasonic guided waves  Blaz Brence, Jannis Bulling, Y.Lugovtsova, Peter Kraemer, Jens Prager
17:30 - 17:50		625	Computer Vision for Non-Destructive Testing of Bridges Based on Influence Lines  A. Martini, Eleonora M. Tronci, Ryan Leung, M. Q. Feng	355	The Effect of the Infill Density in 3D-Printed PLA on Lamb Waves' Propagation Characteristics and their Sensitivity to the Presence of Damage  Mohammad Ali Fakhri, Shishir Kumar Singh, Samir Mustapha, Pawel Malinowski
17:50 - 18:10				359	Polar Coordinate-based Guided Wave Beamforming Imaging using a Scanning LDV  Hyeonwoo Nam, Jun Young Jeon, Chan-Yik Park, Gyuhae Park
18:10 - 18:30					
20:00 - 23:00	Street Food Festivities: Villa Filippina				

**Aula Magna - Plenary Auditorium - Building 7**  
**Chair: DR. FABRIZIO RICCI (University of Naples, Italy)**

<p><b>09:00 - 09:50</b></p>	<p>Keynote 3:  <b>DR. FRANCESCO LANZA DI SCALEA</b> (University of California, San Diego, USA),                  Various applications of ultrasonic waves for material and structural testing</p>	
<p><b>09:50 - 10:20</b></p>	<p>Invited 5:  <b>DR. JOHANNES VRANA</b> (Vrana GmbH, Rimsting, Germany),                  Welcome to the World of NDE 4.0</p>	
<p><b>10:20 - 10:50</b></p>	<p>Invited 6:  <b>DR. ALFREDO CIGADA</b> (Politecnico di Milano, Italy),                  Metrology meets Structural Health Monitoring: a long journey through sensors,                  measurement systems and structures</p>	



**Wednesday - Day 3**

**Aule Polo Didattico - Building 19**

10:50 - 11:30		Coffee Break							
		Aula 3		Aula 4		Aula 5			
SESSION	Nonlinear Ultrasonic Guided Wave Methods for SHM		Wireless Sensing Systems for Structural Health Monitoring		Integrated approaches for SHM: models, data and experiments				
SESSION CHAIRS	Fabrizio Ricci (University of Naples, Italy)		Zahra Sharif Khodaei (Imperial College, UK)		Alice Cicirello (Delft University) and Elizabeth Cross (University of Sheffield)				
11:30 - 11:50	45	Nonlinear Guided Waves-based Localization of Out-of-sight Damage through Local Wave-Direction Estimation	Saeid Hedayatrasa, Joost Segers, Mathias Kersemans	46	A new concept for sensitive capacitive sensing: parallels capacitors with cracked electrodes	Gilles Lubineau, Hussein Nesser	309	Numerical modelling framework of structural cables with complex support conditions	Abdulmagid Bendalla, Guido Morgenthal
11:50 - 12:10	52	Broadband Nonlinear Elastic Wave Modulation Spectroscopy for Inspection of Stiffened Aerospace CFRP panels	Joost Segers, Saeid Hedayatrasa, Wim VanPaepegem, Mathias Kersemans	101	Structural health monitoring system for micro hydraulic power stations through water level monitoring with a wireless network of optical sensors	Danel Bargiela, Ander Zornoza, Igor Ayesta, Amaia Berganza, Gaizka Durana, Joseba zubia	379	Numerical Analysis and Experimental Validation of a contactless SHM method to Measure Stress	Alireza Enshaeian, Lele Luan, Matthew Belding, Hao Sun, Piervincenzo Rizzo
12:10 - 12:30	68	Sparse Array (Nonlinear) Guided Wave Imaging for Localization of Damage in Composites	Yusheng Ma, Saeid Hedayatrasa, K.Van Den Abeele, Mathias Kersemans	134	System identification of MDOF structure using versatility devices	Guyoun Kim, Hongjin Kim, Kyung-Jae Shin	403	Hierarchical model verification and validation for structural health monitoring using dynamic substructuring	James Wilson, P. Gardner, Graeme Manson, Robert Barthorpe
12:30 - 12:50	311	Proof of Concept of Second Harmonics Suppression Using Waveguide Metamaterial Rod	Sandeep Kumar S R, Krishnadas V K, K. Balasubramaniam, P. Rajagopal	160	Structural Health Assessment of a Masonry Bridge using Wireless Sensors - A Case Study	Govardhan Polepally, Venkata Dilip Pasupuleti, Prafulla Kalapatapu	451	Comparison between model prediction and measured response of a prestressed concrete bridge tested to failure	F. Rossi, F. Brighenti, A. Verzobio, Daniel Tonelli, D. Zonta, Placido Migliorino
12:50 - 13:10	464	Experimental investigation of modulation transfer phenomenon due to shear horizontal ultrasonic wave interaction with local nonlinearity	Mariusz Osika, Aleksandra Ziaja-Sujdak, Rafal Radecki, Wieslaw Jerzy Staszewski				456	Damage monitoring in open-hole composites with acoustic emission, validated by complementary NDE techniques	Neha Chandarana, O. Helps, C. Thornton, P. Fromme, A. Doherty, D. Shoukroun, T. Laux, P. Withers
13:10 - 14:30		Lunch Break							

**Wednesday - Day 3**

**Aule Polo Didattico - Building 19**

10:50 - 11:30				Coffee Break					
		Aula 6		Aula 7		Aula 8			
SESSION		Machine learning and modelling in SHM		Real time monitoring of built infrastructure		General Session			
SESSION CHAIRS		Abhishek Kundu and Carol Featherston (Cardiff University, UK)		Vikram Pakrashi and Basuraj Bhowmik (University College Dublin, Ireland)		Marco Lo Cascio and Vincenzo Gulizzi (University of Palermo)			
11:30 - 11:50	455	Integrating physical knowledge into Gaussian process regression models for probabilistic fatigue assessment	Samuel Gibson, Timothy Rogers, Elizabeth Cross	369	Piezoresistive sensors for monitoring actions on structures	Henrieke Fritz, Christian Walther, Matthias Kraus	514	Inferring the size of stochastic systems from partial measurements	Alain Boldini, Maurizio Porfiri
11:50 - 12:10	491	Hybrid Training of Supervised Machine Learning Algorithms for Damage Identification in Bridges	Mihai Adrian Bud, Dragos I. Moldovan, Mihai Nedelcu, Eloi Figueiredo	376	Modelling a damaged multi-span RC bridge based on structural monitoring data	Thorunn Jonasdottir, Jonas Thor Snaebjoernsson, Rune Brincker	541	Wire break detection in bridge tendons using low-frequency acoustic emissions	A. Lange, Max Käding, Reemt Hinrichs, Jörn Ostermann, S. Marx
12:10 - 12:30	499	Imbalanced multi-class classification of Structural Damage in a Wind Turbine Foundation	Jersson Xavier Leon Medina, Núria Parés, Maribel Anaya, Diego Tibađuiza, Francesc Pozo	382	The detecting technology for modular assemblage error by image analysis in deformable modular system	Woo-Geun Lee, Hee-Du Lee, Kyung-Jae Shin, Woo-Sung Jung	552	App4SHM - Smartphone application for structural health monitoring	Eloi Figueiredo, P. Alves, I. Moldovan, H. Rebelo, L. Silva, L. Souza, R. Lopes, P.o Oliveira, N. Penim
12:30 - 12:50	575	Wave propagation modelling via Neural Networks for emulating a wave response signal	Jitendra Kumar Sharma, Rohan Soman, Pawel Kudela, Eleni Chatzi, Wieslaw Ostachowicz	394	Optimal Sensor Placement for Virtual Sensing using Augmented Kalman Filter	Tulay Ercan, Omid Sedehi, Costas Papadimitriou, Lambros Katfygiotis	586	Structural damage detection of offshore structures using Kalman Filtering	Luigi Caglio, Evangelos Katsanos, Henrik Stang, Rune Brincker
12:50 - 13:10				424	Low-cost load monitoring system for the force redistribution assessment in civil structures by means of fiber optic-based transducers	Andrés Herrera, Esteban Paniagua, Carlos Blandón, Carlos Riveros, J. Aristizabal, Julián Sierra	630	Simultaneous estimation of submerged floating tunnel displacement and mooring cable tension using accelerometer and strain gauge measurements	Zhanxiong Ma, Jaemook Choi, Hoon Sohn
13:10 - 14:30				Lunch Break					

**Wednesday - Day 3**

**Aule Polo Didattico - Building 19**

10:50 - 11:30		Coffee Break							
		Aula 9		Aula 10		Aula 11			
SESSION	Seismic structural health monitoring for civil structures		Acoustic Emission for Structural Health Monitoring of Civil Infrastructure			Guided Waves in Structures for SHM			
SESSION CHAIRS	Maria Pina Limongelli (Politecnico di Milano, Italy)		Dr. Didem Ozevin (University of Illinois at Chicago)			Fedreric Cegla (Imperial College, UK) and Aguinardo Fraddosio (University of Bari, Italy)			
11:30 - 11:50	67	Structural Health Monitoring for Architectural Heritage: case studies in Northern and Central Italy.	R. Mario Azzara, M. Girardi, M. Occhipinti, C. Padovani, D. Pellegrini, M. Tanganelli	5	Performance Comparison Between Fiber-Optic and Piezoelectric Acoustic Emission Sensors	Mario Sorgente, Aydin Zadeh, Abdelkrim Saidoun	362	Ultrasonic node synchronized by GPS for rail monitoring	Bastien Chapuis, J. Albertini, C. Fisher, A. Bouché, V. Le Cam, M. Darbois, S. Clément
11:50 - 12:10	139	Structural Monitoring of a Tall Building under Ambient Conditions and Earthquake	Emre Aytulun, Serdar Soyoz	10	Investigation of crack formation during long-term acoustic emission monitoring on a reinforced concrete railroad switch sleeper in the context of structural health monitoring	Gerd Manthei, Marcel Walter, Jens Minnert	386	Fatigue Crack Damage Evaluation by using the Convolutional Neural Network and Guided Wave Features	Jian Chen, Wenyang Wu, Shenfang Yuan
12:10 - 12:30	142	Impact of decision scenarios on the Value of Seismic Structural Health Monitoring	Pier F. Giordano, Said Quqa, M. Pina limongelli	108	Acoustic emission-based detection in restricted-access areas using multiple PZT disc sensors	Lu Cheng, Ali Nokhbatolfighahai, Roger Groves, Milan Veljkovic	400	Monitoring dendrite formation in aqueous zinc batteries with SHO guided waves	Yifeng Zhang, Haobo Dong, Tianlei Wang, Guanjie He, Ivan Parkin, Frederic Cegla
12:30 - 12:50	183	Dynamic identification of the Sant'A. pulpit in Pistoia (Italy): some preliminary notes	Giacomo Zini, M. Betti, Gianni Bartoli	149	Entropy-based technique for denoising of acoustic emission signals	D. Bogomolov, Evgeny Burda, N. Testoni, Irina Kudryavtseva, L. De Marchi, Alexandr Naumenko, A. Marzani	433	Passive Guided Waves Tomography for Monitoring of Corrosion in Pipes	Tom Druet, Bastien Chapuis
12:50 - 13:10	194	Piezo sensors based operational strain modal analysis for shm	Dattar Singh Aulakh, Suresh Bhalla	280	Piezoelectric MEMS Acoustic Sensor Array for Wideband Acoustic Emission Sensing	Talha Khan, Mohammad Merei, Didem Ozevin	477	Assessment of stringer debonding by guided wave inspection in composite structures	V. Memmolo, Leandro Maio, Ernesto Monaco, Fabrizio Ricci
13:10 - 14:30		Lunch Break							

		Aula12	
SESSION	Smart self-sensory concrete based structures and infrastructures		
SESSION CHAIRS	Dr. Yiska Goldfeld (Technion – Israel Institute of Technology)		
11:30 - 11:50	53	A Review on Structural Health Monitoring of Civil Structures Using Magnetic Sensors	Armin Dadras Eslamlou, Aliakbar Ghaderiaram, Mohammad Fotouhi, Erik Schlangen
11:50 - 12:10	83	Realization and testing of hybrid Textile Reinforced Concrete prototype modules sensorized with distributed Fiber Optic Sensors	P. A. Corvaglia, Vincent Lanticq, M. Nucci, Giacomo Iobbi
12:10 - 12:30	287	Preliminary Concept Realization of Intelligent Textile Reinforced Concrete Pipes	Gali Perry, Yiska Goldfeld
12:30 - 12:50	288	Enhanced AC Measurements for Self-Sensory Carbon-based Textile Reinforced Concrete	Mahdi Gaben, Yiska Goldfeld
12:50 - 13:10			
13:10 - 14:30	Lunch Break		

	Aula 3		Aula 4		Aula 5				
SESSION	Infrared Thermography for SHM		SHM in Wind Turbine Technology		Integrated approaches for SHM: models, data and experiments				
SESSION CHAIRS	Giuseppe Pitarresi (University of Palermo) and Rosa de Finis (Politecnico di Bari)		Wieslaw Ostachowicz (Polish Academy of Sciences, Poland) and Jersson X. Leon-Medina (Universitat Politècnica de Catalunya, Spain)		Alice Cicirello (Delft University) and Elizabeth Cross (University of Sheffield)				
14:30 - 14:50	490	Before and after refurbishment: A Thermography Analysis for the Monitoring of an Electric Furnace' Refractory Walls.	M. Méndez, G. Sierra-Vargas, J. Chavez, R. Montes, L. Bonilla, B. Rueda, J. Romero, O. Piamba, J. M. Mantilla	57	Rapid assessment of offshore monopile fatigue using machine learning	Robert C. Houseago, Agota Mockute, Elizabeth Cross, Nina Dethlefs	461	Study of nanocomposite sensors integration into CFRP materials	Pierre Beauchêne, Anne Mavel, Goulven Paradis, Sarah Laudenschach, Jean-Michel Roche, Jean-Claude Lenain
14:50 - 15:10	556	An experimental procedure to estimate surface crack density using thermography and acoustic emissions	Rosa De Finis, D. Palumbo, U. Masone, Marilena Doriana D'addona, R. Teti, U. Galietti	59	Offshore Wind Turbine Jacket Damage Detection via a Siamese Neural Network	Christian Tutivén, Joseph Baquerizo, Yolanda Vidal, Bryan Puruncajas, José SamP.	483	Design Criteria for Structural Health Monitoring Systems. Application to the construction of arches using the cantilevered cable-stayed technique. Tajo Bridge experience	Álvaro Gaute-Alonso, D. Garcia-Sanchez, Felipe Collazos-Arias
15:10 - 15:30	557	Corrosion thickness characterization in steels by means of active thermography	F. curà, Raffaella Sesana, Marie Marguerite Dugand	87	Detection of initiation and propagation of shear web crack in wind turbine blade	Mads Fremmelev, P. Ladpli, E. Orlowitz, Lars Bernhammer, M. McGugan, Kim Branner	510	A self-supervised classification algorithm for sensor fault identification for robust Structural Health Monitoring	Andreea-M. Oncescu, Alice Cicirello
15:30 - 15:50	559	Full-field thermographic analysis for fatiguedamage detection of composite specimens	Alessandra Pirinu, F. Panella	116	Towards a fleetwide data-driven lifetime assessment methodology of offshore wind support structures based on SCADA and SHM data	F. de Nolasco Santos, K.Robbelein, P. D'Antuono, N. Noppe, W. Weijtjens, C.Devriendt	529	An approach to automated characterization of Local Defect Resonances	Andrzej Klepka, Mateusz Krzemiński, Gabriela Loi, Maciej Okoń, Łukasz Pieczonka
15:50 - 16:10	563	Rapid Determination of the Fatigue Behavior at different Stress Ratios of steels by measuring the Energy Release	Danilo D'A., Eugenio Guglielmino, Giacomo Risitano, Dario Santonocito	125	On the minimum required sampling frequency for reliable fatigue lifetime estimation in structural health monitoring. How much is enough?	P. D'Antuono, W. Weijtjens, C.Devriendt	578	The application of the SVD-FDD hybrid method to bridge mode shape estimation	Masaki Sakai, Naoki Kaneko, Ryota Shin, Kiyosuke Yamamoto
16:10 - 16:30	564	Estimating the specific heat loss from temperature measurements in tension-tension fatigue: theory and experiments	Mauro Ricotta, M. Veronese, Giovanni Meneghetti	152	Analysis of icing on wind turbines by combined wireless and wired acceleration sensor monitoring	Bernhard Wondra, Johannes Rupfle, Altug Emiroglu, Christian U. Große	603	Impact Damage Identification on Composite Structures	Richard Loendersloot, Natália Ribeiro Marinho, Frank Grooteman
16:30 - 16:50	569	Frequency Modulated Thermography-NDT of polymer composites by means of human-controlled heat modulation	G. Pitarresi, R. cappello, Alessio Capraro, V. Pinto, Dionisio Badagliacco, Antonino Valenza	310	Periodic System Approximation for Operational Modal Analysis of Operating Wind Turbine	Ambroise Cadoret, E. Denimal, Jean-Marc Leroy, Jean-Lou Pfister, L. Mevel	409	Variational Bayesian Monte Carlo for inference of expensive-to-evaluate models	Felipe Igea, Alice Cicirello
16:50 - 17:10	Boarding Buses to Segesta								
18:00 - 23:00	Visit to Segesta Old Temple & Award Gala Dinner								

		Aula 6		Aula 7		Aula 8	
SESSION	Ultrasonic Monitoring of Concrete Constructions		Real time monitoring of built infrastructure		Human Performance Monitoring		
SESSION CHAIRS	Ernst Niederleithinger (Bundesanstalt für Materialforschung (BAM), Germany)		Vikram Pakrashi and Basuraj Bhowmik (University College Dublin, Ireland)		Ken Loh (Univ. of California, San Diego, USA) and Liming Salvino (University of Michigan, USA)		
14:30 - 14:50	70	Investigation of temperature effects on ultrasonic velocity in a prestressed concrete bridge model  Chun-Man Liao, Daniel Fontoura Barroso	432	Rail Structure Interaction Study using Wireless Sensors- A Case Study  Neridu, Venkata Dilip Pasupuleti, Prafulla Kalapatapu	242	Integrated Vision-Body Sensing System for Tracking People in Intelligent Environments  Gabriel Draughon, Liming Salvino, Jerome Lynch	
14:50 - 15:10	271	From the Lab to the Structure: Monitoring of a German Road Bridge Using Embedded Ultrasonic Transducers and Coda Waves  Niklas Epple, Daniel Fontoura Barroso, Ernst Niederleithinger, Iris Hinderstmann, Cristian Sodeikat, Robin Groschup	437	Technological Advances in Pipeline Health Monitoring and Assessment - A State-of-the-Art  Vibudh Gourishetty, Venkata Dilip Pasupuleti, Prafulla Kalapatapu	253	Kirigami Elastic Fabric Motion Tape Sensors for Large Movement and Human Performance Monitoring  Yun-An Lin, Kenneth Loh	
15:10 - 15:30	427	Monitoring of axial stress of concrete columns using resonance vibration  Agustin Spalvier, Gonzalo Cetrangolo	439	Continuous dynamic monitoring and automated modal identification of an arch bridge  P. Borlenghi, Carmelo Gentile, M. Pirrò	258	Wearable Sensor Platform to Monitor Physical Exertion using Graphene Motion Tape  Aaron Appelle, Yun-An Lin, Emerson Noble, Liming Salvino, Kenneth Loh, Jerome Lynch	
15:30 - 15:50	429	Monitoring Early Cement Hydration with Coda Wave Interferometry  Fabian Diewald, Linda Irbe, Thomas Kränkel, Alisa Machner, Christoph Gehlen	445	Deep Convolutional Neural Network for Segmentation and Classification of Structural Multi-Branch Cracks  Himavanth Kandula, Hrushith Koduri, Prafulla Kalapatapu, Venkata Dilip Pasupuleti	999	Sensing and Data Analytics in Human Balancing Assessments  Song Wang, Ning Xi	
15:50 - 16:10	583	Post-Earthquake Damage Assessment of Reinforced Concrete Members using Combined Passive and Active Ultrasonic Stress Wave Monitoring  Thomas Schumacher, A K M Golam Murtuz, Ali Hafiz, Peter Dusicka, Ernst Niederleithinger	512	Time reliability of empirical models for the prediction of modal parameters: the case of Palazzo Lombardia  F. Lucà, Stefano Pavoni, Stefano Manzoni, Marcello Vanali	407	Fractional calculus as a new perspective in the viscoelastic behaviour of the intervertebral disc  Vincenza Sciortino, Donatella Cerniglia, Salvatore Pasta, Tommaso Ingrassia	
16:10 - 16:30	604	Automated and Continuous Monitoring of Freeze-Thaw Damage in Concrete Using Embedded Piezoelectric Transducers  ARUN NARAYANAN, Ali Sheikh Ali, Brice Delsaute, Christian Pierre, Arnaud Deraemaeker	519	Proposed Cloud Architecture for Real Time Bridge Monitoring using IOT  Visvesh Naraharisetty, Venkat Surendar Talari, Neridu, Prafulla Kalapatapu, Venkata Dilip Kumar Pasupuleti	999	Sensing and Data Analytics in Human Balancing Assessments  Song Wang, Ning Xi	
16:30 - 16:50							
16:50 - 17:10	Boarding Buses to Segesta						
18:00 - 23:00	Visit to Segesta Old Temple & Award Gala Dinner						

		Aula 9		Aula 10		Aula 11		
SESSION	Reliability and quality assessment of SHM systems			Acoustic Emission for Structural Health Monitoring of Civil Infrastructure			Guided Waves in Structures for SHM	
SESSION CHAIRS	Vittorio Memmolo (University of Naples, Italy)			Dr. Didem Ozevin (University of Illinois at Chicago)			Fabrizio Ricci (University of Naples, Italy) and Annamaria Pau (Sapienza University of Rome, Italy)	
14:30 - 14:50	58	A Decision-Supportive Structured Light Monitoring System for Additive Manufacturing Part Surface Profiling	M. Todd, Niall O'Dowd, A. Wachtor	397	Structure Monitoring: Technical Solutions and Application Examples	M. Häuserer	458	Using LiDAR to Identify Planar Measurement Regions in Ultrasonic Inspections of Complex Structures  Ian Cummings, Elena Reinisch, Erica Jacobson, D. Fraser, A. Wachtor, Eric Flynn
14:50 - 15:10	119	Probability of Delamination Detection for CFRP DCB specimens using Rayleigh Distributed Optical Fiber Sensors	F. Falcetelli, Demetrio Cristiani, Nan Yue, Claudio Sbaruffati, Raffaella Di Sante, D. Zarouchas	515	An Improved Shear-Horizontal Wave AE Sensor and an Explanation of SH Wave Mechanics	Cody Borigo, Joseph Rose, Ronnie Miller	473	Assessment of the environmental impacts and benefits of two prospective guided wave based SHM applications  Olivier Mesnil, Clarisse Aujoux
15:10 - 15:30	191	Cross-spectrum-based synchronization of structural health monitoring data	Kosmas Dragos, Filipe Magalhães, George Manolis, Kay Smarsly	21	Damage mode shift on masonry strengthened by textile reinforced mortar as detected by Acoustic Emission, Ultrasounds and Digital Image Correlation	D. Linn, Gilles Vandereecken, Nick Ndemou, Eleni Tsangouri	474	Stress monitoring of plates by means of nonlinear guided waves  Meng Wang, A. Pau
15:30 - 15:50	338	A model-assisted case study using data from Open Guided Waves to evaluate the performance of guided wave-based Structural Health Monitoring systems	Kilian Tschöke, Inka Mueller, V. Memmolo, R.Sridaran Venkat, Mikhail Golub, A. Eremin, M. Moix-Bonet, K. Möllenhoff, Y.Lugovtsova, J. Moll, S. Freitag				492	Computational Lamb Wave Analysis of a CFRP Shortened Curing Cycle  Elie Mahfoud, Mohammad Harb
15:50 - 16:10	476	A Model-Assisted Approach to Sensor Network Design in Guided Wave Based SHM Systems	Enes Savli, Kilian Tschöke, Robert Neubeck, Lars Schubert				540	Non-Linear Ultrasonic Study of Adhesion Defects Between FRCC Reinforcements and Masonry  Anna Castellano, Aguinardo Fraddosio, Tribikram Kundu, Mario D. Piccioni
16:10 - 16:30	495	Performance assessment for artificial intelligence-based data analysis in ultrasonic guided wave-based inspection: a comparison to classic path-based probability of detection	Inka Mueller, S. Freitag, V. Memmolo, M. Moix-Bonet, Kathrin Möllenhoff, Mikhail Golub, R.Sridaran Venkat, Y.Lugovtsova, Artem Eremin, J. Moll, Kilian Tschöke				607	Modeling Magnetostrictive Transducers for SH Guided Wave Generation and Reception for Structural Health Monitoring  Gaofeng Sha, Cliff Lissenden
16:30 - 16:50								
16:50 - 17:10								
18:00 - 23:00								

Boarding Buses to Segesta

Visit to Segesta Old Temple & Awards Gala Dinner

**Aula Magna - Plenary Auditorium - Building 7**  
**Chair: Ivano Benedetti**

**09:20 - 10:10**

Keynote 4:  
**DR. JOSEPH ROSE**, (Professor Emeritus, Pennsylvania State University, USA),  
Ultrasonic Guided Waves for Enhanced Acoustic Emission Analysis

**10:10 - 11:00**

Keynote 5:  
**DR. HOON SOHN**, (KAIST, South Korea)  
Online monitoring and process control during metal additive manufacturing



**Thursday - Day 4**

**Aule Polo Didattico - Building 19**

11:00 - 11:30		Coffee Break							
		Aula 3		Aula 4		Aula 5			
SESSION	Condition monitoring of ageing bridges and infrastructure		SHM in Wind Turbine Technology				Wireless Sensing Systems for Structural Health Monitoring		
SESSION CHAIRS	Matt DeJong (UC Berkeley, USA) and Haris Alexakis (Aston University)		Wieslaw Ostachowicz (Polish Academy of Sciences, Poland) and Christian Tutivén (Universitat Politècnica de Catalunya, Spain)				Zahra Sharif Khodaei (Imperial College, UK)		
11:30 - 11:50	25	Fatigue analysis of a steel railway bridge using long term strain data: Event detection and train features' effect on fatigue damage	Negin Sadeghi, Maximillian Weil, N. Noppe, W. Weijtjens, C.devriendt	332	Structural Health Monitoring of Offshore Jacket Platforms via Transformers	Christian Tutivén, Héctor Triviño, Yolanda Vidal, José SamP.	187	A New Real-time SHM System Embedded on Raspberry Pi	Mario de Oliveira, Raul Nascimento, Douglas Brandão
11:50 - 12:10	63	Effect of Aging of Bearings on the Behavior of Single-Span Railway Bridges	Erduran Emrah, Christian Nordli, Mohammadreza Salehi, Semih Gonen	339	Executable Digital Twin: real-time hybrid testing of wind turbine blades	Emilio Di Lorenzo, Silvia Vettori, Filippo Capurso, Pavel Jiranek, Tommaso Tamarozzi, Peter Berring, Kim Branner	197	In-service wireless monitoring of high-temperature pipes using ultrasonic sensors and the LoRaWAN protocol	Sevan Bouchy, Pierre Belanger, Ricardo Zednik
12:10 - 12:30	97	Enhancing condition assessment of ageing bridges based on complementary sensing techniques	Haris Alexakis, Nikolaos Tziavos, Jennifer Schooling, Matthew DeJong	420	Modelling of damping contributions on a fleet of full-scale operating offshore wind turbines with Gaussian Process regression	L. D. Avendaño-Valencia, Silas Sverre Christensen, E. Orlowitz	395	Structural Health Monitoring Using Wireless Sensor Networks with Nonsimultaneous Sampling	Jyrki Kullaa
12:30 - 12:50	127	Long-term structural monitoring of a skewed masonry arch railway bridge using Fibre Bragg Gratings	Sam Cocking, Matthew DeJong	589	Machine Learning techniques for damage detection in wind turbine blades	André Tavares, B. Lopes, Emilio Di Lorenzo, Bram Cornelis, Bart Peeters, Wim Desmet, K. Gryllias	632	Ultrasonic monitoring of a hydrogen pressure vessel in operation	Olivier Bardoux, Valentin Perret, Natalia Marcial, Sophie Wastiaux, Daniel Gary
12:50 - 13:10	156	A novel procedure for damping ratio identification from free vibration tests with application to existing bridge decks	M. Mazzeo, Dario De Domenico, G. Quaranta, Roberta Santoro	617	Onshore farm-wide fatigue evaluation based on instrumented wind turbine and SCADA data	João Pacheco, F. Pimenta, Sérgio Pereira, Álvaro Cunha, Filipe Magalhães			
13:10 - 13:30				631	Monitoring of thermoplastic composites with an FBG inscribed in highly-birefringent optic fiber	Karol Wachtarczyk, N. Yadav, P. Gasiór, R. Schledjewski, J. Kaleta			
13:10 - 14:30	Lunch Break								

**Thursday - Day 4**

**Aule Polo Didattico - Building 19**

11:00 - 11:30		Coffee Break							
		Aula 6		Aula 7		Aula 8			
SESSION	Machine learning and modelling in structural health monitoring		Standardization and guidelines on SHM and NDT: needs and ongoing activities			Nonlinear SHM methods for high sensitivity			
SESSION CHAIRS	Abhishek Kundu and Carol Featherston (Cardiff University, UK)		Maria Pina Limongelli (Politecnico di Milano, Italy) and Daniele Zonta (University of Trento, Italy)			Cliff Lissenden (Pennsylvania State University)			
11:30 - 11:50	600	Delamination identification using global convolution networks	Abdalraheem Ijeh, Pawel Kudela	167	Offline Algorithm Selection of CMA-ES Variants in Bayesian Optimal Sensor Placement: Application to Buildings and Recommendations to the Ppi- ne Instrumentation Practice	Ammiel Mac Barros, Jaime Hernandez, Jr.	314	Identification of contact acoustic nonlinearities of subsurface cracks located at free-edges	Christoph Kralovec, Martin Schagerl
11:50 - 12:10	601	An Adaptive Data-Driven Prognostic Methodology for Composite Structures	Nick Eleftheroglou, D. Zarouchas, R. Benedictus	296	Defect or not a defect? That is the question!	Sylvia KeBler, Fabian Dethof, Daniel Kanzler, Marija Bertovic, Thomas Heckel, Anne Jüngert, Johannes Vrana	419	Some exceptional features of flexural wave scattering by a cluster of nonlinear scatterers on a beam	Angelis Karlos, Pawel Packo
12:10 - 12:30	602	A spatial autoregressive approach for wake field prediction across a wind farm	Weijiang Lin, Keith Worden, Elizabeth Cross	372	Small Punch Test method for SHM	Maciej Kaliciak, Tadeusz Uhl, Marek Nowak	459	Investigation of thermoelastic modulation phenomenon due to frictional dissipation on crack interfaces.	Aleksandra Ziaja-Sujdak, Mariusz Osika, Rafal Radecki, Wieslaw Jerzy Staszewski
12:30 - 12:50	620	ConvLSTM based approach for delamination identification using sequences of Lamb waves	Pawel Kudela, Saeed Ullah	402	A preliminary qualification approach for structural health monitoring systems	Paolino Cassese, Carlo Rainieri, Giuseppina De L., A. Bonati, A. Occhiazzi	465	Investigation of the vibro-modulation effect in the pressure changing nonlinear surface contact	Rafal Radecki, Aleksandra Ziaja-Sujdak, Mariusz Osika, Wieslaw Jerzy Staszewski
12:50 - 13:10				525	Condition-states and maintenance of transport infrastructures and SHM	Alfred Strauss	566	Sensing devices with highly non-linear sensing characteristics to simplify data interpretation and enhance robustness in Structural Health Monitoring – The use of carbon black in epoxy-based composites for moisture detection	Helge Pfeiffer, Rémy Fauche, Martine Wevers
13:10 - 14:30		Lunch Break							

**Thursday - Day 4**

**Aule Polo Didattico - Building 19**

11:00 - 11:30		Coffee Break							
		Aula 9		Aula 10		Aula 11			
SESSION	Seismic structural health monitoring for civil structures		Ultrasonic and electromagnetic waves for diagnosis, monitoring and control			Guided Waves in Structures for SHM			
SESSION CHAIRS	Maria Pina Limongelli (Politecnico di Milano, Italy)		Leandro Maio (Università degli Studi di Napoli "Federico II", Italy) and Jochen Moll (Goethe University of Frankfurt am Main, Germany)			Annamaria Pau (Sapienza University of Rome, Italy) and Fabrizio Ricci (University of Naples, Italy)			
11:30 - 11:50	228	Application of innovative High Accuracy GNSS based system to the monitoring of civil structures	D. Cinque, D. Spina, R. Capua, D. Antonetti, Stefano Gabriele	39	Monitoring of Pipelines using Microwave Structural Health Monitoring	Lennart Fox, J. Moll, Viktor Krozer	41	The use of circumferential guided waves to monitor axial cracks in pipes	Euan Rodgers, Stefano Mariani, Peter Cawley
11:50 - 12:10	231	Monitoring-driven safety tagging for earthquake-damaged residential buildings	Yves Reuland, Panagiotis Martakis, Eleni Chatzi	107	Analysis and compensation of relative humidity and ice formation effects for radar-based SHM systems embedded in wind turbine blades	Jonas Simon, J. Moll, Viktor Krozer, Thomas Kurin, Fabian Lurz, O. Bagemiel, Stefan Krause	615	Damage detection in rods via use of a genetic algorithm and a deep-learning based surrogate	Jitendra Kumar Sharma, R. Soman, P. Kudela, E. Chatzi, W. Ostachowicz
12:10 - 12:30	365	Seismic Monitoring of Masonry Structures using Smart Bricks: Experimental Application to Masonry Walls subjected to In-Plane Shear Loading	A. Meoni, A. D'A., Felice Saviano, Gian Piero Lignola, Fulvio Parisi, Filippo Ubertini	158	Adaptive Nonlinear Suspension Control of Maglev Trains by Deep Reinforcement Learning	Qi Zhu, Su-mei Wang, Yi-qing Ni	619	Ultrasonic Damage Assessment using Virtual Time Reversal Indices and the RAPID method	Bruno Castro, Fabricio Baptista, F. Ciampa
12:30 - 12:50	448	Sensitivity analysis of the environmental effect on the dynamics of concrete historical architectures with structural joints	Linda Scussolini, Giorgia Coletta, Valerio Oliva, Gaetano Miraglia, Erica Lenticchia, Rosario Ceravolo	179	In-process monitoring of surface roughness of internal channels using ultrasound	Zeqing Sun, Peng Zuo, Mato Pavlovic, Yi Feng Ang, Zheng Fan	486	High-order accurate free-vibration and transient analysis of multilayered plates and shells	Vincenzo Gulizzi, A. Milazzo, Ivano Benedetti
12:50 - 13:10	215	Seismic Assessment of the Carillon Tower in the P.pines using a Finite Element Model Updated with Operational Modal Analysis	Ammiel Mac Barros, Helli-mar Trilles, Jaime Hernandez, Jr.	264	Reconstruction of Elastic Constants of Isotropic and Anisotropic Materials using Ultrasonic Guided Waves	Y.Lugovtsova, Jannis Bulling, Jens Prager			
13:10 - 14:30		Lunch Break							

	Aula 3		Aula 4		Aula 5
<b>SESSION</b>	Condition monitoring of ageing bridges and infrastructure		New opportunities for structural health monitoring and artificial intelligence		
<b>SESSION CHAIRS</b>	Matt DeJong (UC Berkeley, USA) and Sam Cocking (Aston University)		Aswin Haridas (Airbus, Germany) and Chia-Ming Chang (National University of Taiwan)		
14:30 - 14:50	255	Assessing the reliability of efficient sampling methods for Gaussian processes from a probabilistic fatigue analysis perspective  Samuel Gibson, Elizabeth Cross	34	Tunnel Asset Management at CERN  Roddy Cunningham, John Osborne, Eliseo Perez-Duenas, Zili Li, Darragh O'brien	
14:50 - 15:10	460	How to make a self-sensing house with distributed fiber optic sensing  Werner Lienhart, Christoph Monsberger, Fabian Buchmayer	246	Condition Monitoring of cold stamping presses based on Fiber Optic Sensors.  Tania Grandal, Rubén Ruiz	
15:10 - 15:30	516	Automation in documentation of ageing masonry infrastructure through image-based techniques and machine learning  D. Loverdos, V. Sarhosis	279	Application of Pixel-wise Component Recognition and Change Detection to In-Situ Bridge Inspection  Ting-Yan Wu, Shun-Hsiang Hsu, Chia-Ming Chang	
15:30 - 15:50			384	Autonomous Early Warning System for Monitoring Critical Infrastructure Elements using Smart Multi-Sensors  Aswin Haridas, P. D. Okulov, Mert Altindag, Stefan Neumann, Holger Speckmann	
16:00 - 16:30	Closing Ceremony - Aula 3				

		Aula 6	Aula 7	Aula 8
SESSION		Verification & Validation approaches for Demonstrating the Value of SHM	Health Monitoring methodologies and technologies for aerospace actuation and drive systems	
SESSION CHAIRS		Ivano Benedetti (University of Palermo, Italy)	Ernesto Monaco (Università degli Studi di Napoli "Federico II", Italy)	
14:30 - 14:50	498	Gaussian process latent force models for virtual sensing in a monopile-based offshore wind turbine  Joanna Zou, Alice Cicirello, Alexandros Iliopoulos, Eliz-Mari Lourens	33 Condition monitoring of a gear box by acoustic camera and machine learning techniques  M. Rosaria Milo, G. Petrone, A. Casaburo, Sergio De Rosa, Renato Brancati, Ernesto Rocca	
14:50 - 15:10	523	Predictive maintenance of aircraft primary structures based on load monitoring  Fabrizio Ricci, Ernesto Monaco, U. Mercurio, Lorenzo Pellone, Ignazio Dimino, M. Oliva, Vincenzo Capuano	436 Health Monitoring methodologies for aerospace electromechanical actuation systems  V. Memmolo, Ernesto Monaco, Fabrizio Ricci	
15:10 - 15:30	553	Retrofitting Potentials in Aircraft Structural Health Monitoring – A Value of Information analysis  Lily Koops, Kai-Daniel Buechter	576 Development of a specific solution for monitoring tension in bolts for aerospace structures  David Barnoncel	
15:30 - 15:50	181	On the Probability of Localizing Damages Based on Mode Shape Changes  Alexander Mandler, Szymon Gres, Michael Döhler, Sylvia Keßler		
16:00 - 16:30	Closing Ceremony - Aula 3			

	Aula 9			Aula 10			Aula 11		
SESSION	Seismic structural health monitoring for civil structures			Ultrasonic and electromagnetic waves for diagnosis, monitoring and control			General Session		
SESSION CHAIRS	Maria Pina Limongelli (Politecnico di Milano, Italy)			Kilian Tschöke (Fraunhofer-Institut für Keramische Technologien und Systeme (IKTS))			Marco Lo Cascio and Vincenzo Gulizzi (University of Palermo)		
14:30 - 14:50	530	Damage Detection in Truss Structures Using Modal Expansion and Flexibility Matrix	M. Modesti, C. Gentilini, A. Palermo	531	The use of a magnetic probe coupler to aid the reliability of Manual ultrasonic testing (MUT) on Carbon Steel components	Jonathan Francis	520	5 <sup>th</sup> Generation Video Capturing Low-cost Efficient Wireless Intelligent Sensors (LEWIS 5: Video) to Measure Live Loads	Joshua Murillo, Fernando Moreu
14:50 - 15:10	605	Structural health monitoring systems operating in a 5G-based network	F. Franchi, Vincenzo Gattulli, F. Graziosi, F. Potenza	560	An adaptive impedance matching network for ultrasonic ice removal	Raffaele Piscopo, Leandro Maio, Fabrizio Ricci	211	Towards Super-resolution Ultrasonic Array Imaging via Hierarchical Multi-scale Deep Learning	Yongchao Yang, Homin Song
15:10 - 15:30	629	Automating the Frequency Domain Decomposition Technique Using Modal Assurance Criterion	Amir Reza Elahi, A. Cardoni, M. Domaneschi, Gian P. Cimellaro	585	Practical experiences to know making Acoustic Emission-based SHM successful	Jonathan Liebeton, Dirk Soeffker	699	SHM-based detection of predefined damage scenarios on a test bridge	Yogi Jaelani, A. Klemm, J. Wimmer, F. Seitz, M. Köhncke, F. Marsili, A. Mendler, M. Von Danwitz, S. Keßler, S. Henke, Max Gündel, T. Braml, A. Popp
16:00 - 16:30	Closing Ceremony - Aula 3								