Fecha del CVA	20/12/2023

Parte A. DATOS PERSONALES

Nombre	Antolín		
Apellidos	Lorenzana Ibán		
Sexo	Hombre	Fecha de Nacimiento	
DNI/NIE/Pasaporte	***617***		
URL Web	https://www.itap.uva.es/ali/		
Dirección Email	ali@eii.uva.es		
Open Researcher and Contributor ID (ORCID)	0000-0003-2562-0532		

A.1. Situación profesional actual

Puesto	Catedrático de Universidad		
Fecha inicio	2020		
Organismo / Institución	Universidad de Valladolid		
Departamento / Centro	Dpto. Construcciones Arquitectónicas, Ingeniería del Terreno y Mecánica de los Medios Continuos y Teoría de Estructuras / Escuela de Ingenierías Industriales		
País		Teléfono	
Palabras clave	Ingenieria mecanica; Tratamiento de datos; Control en variables de estado; Modelado de sistemas; Dispositivos electrónicos; Ingenieria civil; Ingeniería de construcción		

A.3. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Doctor Ingeniero Industrial	Universidad de Valladolid	1995
Ingeniero Industrial (esp. Mecánica)	Universidad de Valladolid	1992

Parte B. RESUMEN DEL CV

After his MSc (ranked #1 of his class) in 1992 in Mechanical Engineering (Ingeniería Industrial) by the University of Valladolid (Uva), Spain, Dr A Lorenzana began as an assistant lecturer, teaching Strength of Materials and Structures in the same University. He completed his PhD Thesis in 1995, in numerical methods for plasticity with large strains and large displacements. He got the position of Senior Lecturer (Profesor Titular de Universidad) in 1996, becoming the staff member responsible for Structures and Industrial Buildings (MSc-Industrial Engineering) and Structures (year 4 in BSc-Mechanical Engineering).

His research interest is in non-linear modelling and simulation using numerical techniques (Boundary and Finite Element Method), contact mechanics, limit behaviour for beam and plate structures, including plasticity and damage and, more recently, structural dynamics, vortex induced vibration, structural control using mitigation devices and SHM. Eleven PhD Thesis have been performed under his supervision: modelling of elastomeric materials using BEM in 1998, a new approach for plastic analysis of framed structures in 2002, and for plastic analysis including damage in 2009, numerical model for vortex induced vibrations in line-like structures also in 2009, non-linear vibrations in steel structures in 2010, collapse simulation of steel structures in 2013, serviceability in lively footbridges in 2014, reverse engineering in 2017, optimization for passive mitigation devices in 2018, active mass dampers modelling in 2019 and estimation of full-rank physical matrices from an incomplete modal models in 2020. Four of these PhD Thesis have “international mention” mark and three have been recognised with special awards. As result of his scientific activities, he is author of more than 50 indexed journal papers and more than 110 international conference papers.

He collaborates regularly in research activities with professor Iván Muñoz since 2008 (ETSICCP, UPM, Madrid), James Brownjohn since 2009 (VES group, University of Sheffield, now in the U. of Exeter, UK), Emiliano Pereira since 2010 (EPS, U. of Alcala de Henares) and

since 2018 with Tomislav Jarak, from the FSB, University of Zagreb, now at the UVa. These collaborations have resulted in several joint papers and conferences, as well as more than 10 research stays (of Spanish researchers abroad and foreigner researchers at UVa).

Together with his activities in the UVa, he has been the head of the Mechanical Engineering Division, CARTIF from 2003 to 2018, a technological centre focused on control and robotics. Since 2007 the main research line is in the analysis of vibrations of slender structures, mitigation devices and vulnerability, field where more than 10 competitive research projects and more than 80 contracts with companies were carried out.

As a member of the ITAP research institute of the UVa, aggrupation specialised in Industrial Tecnologies and their APplications, several projects have been successfully developed related with vibrations in industrial equipment and also with oscillations in civil slender structures as large viaduct piers, tower cranes, industrial chimneys, pedestrian bridges or grandstands. Some original applications (patented) for adaptive and passive devices have been proposed and several vibration serviceability problems in footbridges solved in cooperation with construction companies.

Main metrics:

Research 6-year evaluations: 5 sexenios (1994-1999, 2005-2010, 2011-2016, 2017-2022 and Transferencia 2000-2012).

More than 50 JCR journal papers and more than 110 conference papers.

PhD supervised: 11 (1998, 2002, 2009x2, 2010, 2013, 2014, 2017, 2018, 2019, 2020), four of them with “international mention” and three with special awards.

Over 2 years research stays at international institutions (visiting professor in CalTech/USA in 1998, Linkoping University/Sweden in 2002, and University of Sheffield/UK in 2009/2010)

Google Scholar: h index: 11; i10: 12; number of citations: 652

Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES

C.1. Publicaciones más importantes en libros y revistas con “peer review” y conferencias

AC: Autor de correspondencia; (nº x / nº y): posición firma solicitante / total autores. Si aplica, indique el número de citaciones

1 2022. Human-induced force reconstruction using a non-linear electrodynamic shaker applying an iterative neural network algorithm. BPASTS.

2 2021. A Common Framework for Tuned and Active Mass Dampers: Application to a Two-Storey Building Model. Experimental Techniques. Springer.https://link.springer.com/article/10.1007/s40799-020-00432-2.

3 2021. Design and Validation of a Scalable, Reconfigurable and Low-Cost Structural Health Monitoring System. Sensors. 10.3390/s21020648.

4 2021. Measurement of acceleration response functions with scalable low-cost devices. An application to the experimental modal analysis. Sensors. 10.3390/s21196637.

5 2021. On the Estimation of the Moving Mass of a TMD Installed on a Lively Structure. Applied Sciences. https://www.mdpi.com/2076-3417/11/10/4712.

6 2021. Performance of a TMD to Mitigate Wind-Induced Interference Effects between Two Industrial Chimneys. Actuators. 10.3390/act10010012.

7 2021. PhysEx: A novel procedure to estimate full-rank physical matrices of a structure from an incomplete modal model. Journal of Sound and Vibration. Elsevier. 10.1016/j.jsv.2021.116277.

8 2020. A pseudo-inverse approach to the physical model estimation problem. Capacities and limitations. EASD_EuroDyn Procedia. dx.doi.org/10.47964/1120.9079.20141.

9 2019. A transmissibility-based procedure to estimate the modal properties of an on-board tuned mass damper. Mechanical Systems and Signal Processing. doi.org/10.1016/j.ymssp.2019.106378.

10 2018. Ad-hoc vibration monitoring system for a stress-ribbon footbridge: from design to operation. Smart Structures and Systems. doi.org/10.12989/sss.2018.22.1.013.
11 2018. Modal and dynamic analysis of a footbridge in servicev. Rev. int. métodos numér. cálc. diseño ing. doi.org/10.23967/j.rimni.2017.8.004.
12 2018. Reverse engineering using photogrammetry and segmentation for industrial structures. DYNA. doi.org/10.6036/8549.
13 2017. Structures vibration control via Tuned Mass Dampers using a co-evolution Coral Reefs Optimization algorithm. J. Sound Vib.doi.org/10.1016/j.jsv.2017.01.019.
14 2017. Walking model to simulate interaction effects between pedestrians and lively structures. ASCE's Journal of Engineering Mechanics. doi.org/10.1061/(ASCE)EM.1943-7889.0001326.

C.2. Congresos

1 Design and characterization of an eddy current damper applied to vibration mitigation. CMMoST23. 2023.
2 Experimental approach for optimal design of a TMD in a lightweight footbridge. ICCSM2022. 2022.
3 Human-induced force reconstruction using a non-linear electrodynamic shaker applying ANN-based iterative learning controller. EACS2022. 2022.
4 Innovative large timber foodbridges and dynamic testing in Spain. ICTB 2021. 2022.
5 Innovative large timber foodbridges and dynamic testing in Spain. ICTB2022. 2022.
6 New low-cost sensor for timber structural health monitoring. SHATIS2022. 2022.
7 Obtaining a fem-less physical model of a structure. A case study. DINEST2021. 2021.
8 A methodology to estimate the properties of a tuned mass damper installed on a slender structure. CMMoST2021. 2021.
9 Damage detection in slender structures based on a hybrid system of supervised learning algorithms and model updating to analyze raw dynamic data. CMMoST2021. 2021.
10 Design, implementation and experimental validation of an active mass damper for vibration mitigation in slender structures using a low-cost processo. DINEST2021. 2021.
11 On the design of several tuned mass dampers for a multi-degree of freedom model of a shear building. CMMoST2021. 2021.
12 Modal identification of structures during static load testing: interaction effects. Eurodyn2020. 2020.
13 Mitigazione delle vibrazioni nelle costruzioni mediante dispositivo di protezione passiva del tipo magnetic flexural damper. AIMETA. 2019.

C.3. Proyectos o líneas de investigación

1 **Proyecto**. PID2022-140117NB-I00, (DAS)2 Development of an autonomous system for the dynamic assessment of slender structures: an hybrid approach from design to preservation. Ministerio de Ciencia, Innovación y Universidades. 2023-2026. 150.125 €. Investigador principal.
2 **Proyecto**. RED2022-134431-T, Monitorización e inspección para la evaluación de estructuras en servicio. 2023-2024. 18.100 €.
3 **Proyecto**. TSHMLowC4.0 Monitorización y diagnóstico de la salud de las estructuras de madera en el patrimonio cultural a partir de técnicas dinámicas de bajo coste. Junta de Castilla y León. 2020-31/10/2023. 264.000 €.
4 **Proyecto**. RTI2018-098425-B-C21, PA5S Proposal for an augmented and smart SHM system for slender structures.. Ministerio de Ciencia, Innovación y Universidades. A. Lorenzana. 2019-2022. 118.000 €. Investigador principal.
5 **Proyecto**. Zagreb_UKF21/19, SEAMLESS Development of SHM systems for slender structures. Zagreb_UKF21/19. Ministry of Science and Education, Republic of Croatia (HrZZ). T. Jarak. 2019-31/12/2019. 8.366 €.
6 **Proyecto**. BIA2015-71942-REDT, Red sobre técnicas experimentales en dinámica estructural, de actualizado y simulación computacional, dispositivos de mitigación de vibraciones y evaluación del estado límite de servicio. Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia. A. Lorenzana. 2016-2017. 21.000 €. Plan Estatal de Investigación Científica y Técnica y de Innovación 2013-2016

7 **Proyecto**. BIA2014-59321-C2-2-R, Prognosis y análisis integrado de las vibraciones inducidas por el hombre en estructuras . BIA2014-59321-C2-2-R. Ministerio de Ciencia e Innovación. A. Lorenzana. 2015-2017. 54.000 €. Coordinador.

8 **Proyecto**. DPI-2011-14607-E,, Red de Investigación Cooperativa en Monitorización, Control de Vibraciones y Detección de Daños en Estructuras Inteligentes. DPI-2011-14607-E,. Ministerio de Ciencia e Innovación. Subprograma de Acciones complementarias a los proyectos de investigación fundamental no orientada. (€9.000). J. Rodellar. 2012-2014. 9.000 €.

9 **Proyecto**. BIA2011-28493-C02-02, Técnicas experimentales y numéricas para la valoración del comportamiento vibratorio de pasarelas peatonales BIA2011-28493-C02-02.. Ministerio de Ciencia e Innovación. A. Lorenzana. 2012-2014. 61.000 €. Coordinador.

10 **Proyecto**. EP/G061130/1, "Dynamic Performance of Large Civil Engineering Structures: An Integrated Approach to Management, Design and Assessment" (EP/G061130/1). EPSRC Platform Grant. UK. A. Pavic. Desde 2009.

11 **Proyecto**. PCT-380000-2007-4, Diseño de Sistemas de Control Avanzados de Amortiguación de Vibraciones en Estructuras Civiles basados en Dispositivos de Control Semiactivos Proyecto de Investigación Industrial. Profit de Parques. A. V. Poncela. Desde 2008.

12 **Proyecto**. VA019A07_EDU/14642006, Diseño de amortiguadores de masa pasivos y semiactivos para la reducción de vibraciones en pasarelas peatonales.. Programa de Apoyo a Proyectos de Investigación. Junta de Castilla y León (€15.000). A. V. Poncela. Desde 2007.

13 **Proyecto**. C16/2006, Desarrollo de sistemas avanzados de amortiguación de vibraciones basados en dispositivos de control semiactivos: Aplicación a pasarelas peatonales y grúas torre.. Ministerio de Fomento. A.V. Poncela. Desde 2006.

14 **Contrato**. Proyecto integral de intervención especializada del rescate y Salvaguarda de los murales elaborados con la técnica del Mosaico mexicano localizados en el centro SCOP CAV_Méjico. 2023-01/09/2023. 52.000 €.

15 **Contrato**. Diseño y desarrollo de un módulo de monitorización mediante AIVC UpIntelligence. Desde 2022.

16 **Contrato**. Incremento del amortiguamiento estructural en columna Nobelson B1 SETGA SLU. Desde 2022.

17 **Contrato**. Transferencia de conocimiento para la implementación de sensores inerciales en seguridad y emergencia UpIntelligence. Desde 2022.

18 **Contrato**. Estudio de silenciadores tipo SCv18 y SCV92. Iberacústica. Desde 2020.

19 **Contrato**. Knowledge transfer for the development of sensoring IoT networks for real time MAYBE SA. Desde 2020.

20 **Contrato**. Auscultación dinámica y evaluación del estado límite de servicio respecto a vibraciones en pasarelas de madera FUNDACION CENTRO TECNOLOGICO FORESTAL Y DE LA MADERA (CETEMAS). Desde 2019.

21 **Contrato**. Control inercial de estructuras flexibles. Cartif. Desde 2018.

C.4. Actividades de transferencia de tecnología/conocimiento y explotación de resultados

1 A. Lorenzana; Á. Magdaleno; A. Poncela; O.Hernández. P201730988. Amortiguador de masa sintonizable. España. 28/07/2018. Universidad de Valladolid.

2 A. Lorenzana; Á. Magdaleno; N. Ibán; M. Rodríguez. P201730925. Dispositivo para mitigación de oscilaciones. España. 12/07/2018. Cartif.

3 A.Lorenzana; J. Sebastian; A. Poncela; C. Casado. P201032004. Amortiguador de masa magnético de rigidez variable. España. 30/12/2010. Cartif.

4 Antolín Lorenzana Ibán; Alfonso Poncela Méndez. U200602515. Supresor de vibraciones en grúas torre. España. 01/05/2007. Dragados S.A..