CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

CV date	11/01/2022

Part A. PERSONAL INFORMATION

First name	CRISTINA
Family name	CASTEJÓN SISAMÓN

e-mail	castejon@ing.uc3m.es	URL Web	https://www.maglab.org/es/
Open Research and Contributor ID (ORCID)(*)		0000-0002-5823-7372	

(*) Mandatory

A.1. Current position

Position	tenured professor		
Initial date	24/11/2009		
Institution	UNIVERSIDAD CARLOS III DE MADRID (UC3M)		
Departament/Center	Mechanical Engineering Departament / School of Engineering		
Country	Spain	Teleph. number	916245929
Key words	Vibrations and noise in machines, prognosis, Mechatronics. Maintenance 4.0, rolling stock modelling, dynamic model, predictive maintenance.		

A.2. Previous positions (research activity interruptions, art. 45.2.c))

Period	Position/Institution/Country/Interruption cause
01/03/2006-23/11/2009	Profesor Contratado Doctor / Contracted Lecturer, holder of a PhD/ UC3M / Spain
21/12/2001-28/02/2006	Profesor Ayudante Doctor / assistant lecturer / UC3M / Spain
16/10/1998-20/12/2001	Profesor ayudante / assistant / UC3M / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
phD in Industrial Engineering	UC3M / Spain	2002
Bsc. Industrial Engineering	UC3M / Spain	1998

Part B. CV SUMMARY *(max. 5000 characters, including spaces)*

Cristina Castejón achieve her degree in Industrial Engineer in 1998 and her doctorate within the Industrial Technologies program in 2002 both at Carlos III University of Madrid (UC3M). Her pre-doctoral research career focused on the design of environment models for outdoor robot navigation, working in the field of sensor fusion and artificial intelligence. After defending

her doctoral thesis, she joined the mechanical engineering department (UC3M) and started her participation in the research lines of fault detection in rotating mechanical elements, where she contributes with the application of intelligent classification systems to different models and systems. The first results were achieved with the supervising of a doctoral thesis (2007) and their respective publications in the field. On the other hand, she is also involved in the department's line of research related to the design of robotic structures for service tasks, participating in two research projects financed by the Spanish government in coordination with the robotics group of the same university. In The emergence of the industry 4.0 paradigm has allowed this researcher to pose a new challenge to her lines of research, focusing her experience in modeling and signal processing for evaluating the state of a mechanical system in a single line called Maintenance 4.0. It is a novel and highly interesting line on which few researchers are focusing. Since October 96, she has been involved in teaching and research activities financed by different types of scholarships and contracts. She teaches in degrees and Master courses as an expert in machine theory, maintenance and connected industry 4.0. She is a founding member and current director of the MAQLAB research group, member of the 'Pedro Juan de Lastanosa' research institute and a member of the 'Technologies for the Digital World' Academic Unit, all belonging to UC3M. She is a member of the World Federation of Machines and Mechanisms (IFToMM), being the current president of the permanent commission of Education since 2017. She has been the secretary of the Higher Polytechnic School (2016-2020) and currently she is Deputy Vice Rector for Scientific Policy since December 2020.
PhD. Castejón has 2 six-year research periods, the last one granted in 2017. She has supervised 2 doctoral theses in the field of predictive maintenance and the modeling of faulty mechanical systems, both with publications in JCR impact journals and awarded one of them as the best doctoral thesis by the Spanish association of mechanical engineering. She currently supervises two theses in the maintenance and design 4.0 topics. She has published more than 40 articles, 36 indexed in JCR, 6 book chapters, and has participated with her publications in numerous conferences. She has participated in more than 30 research and development projects, 2 financed by CAM (being IP in one of them), 8 with state funding (being IP in two of them) and 2 with European funding. The results of her research have been transferred as 8 patents and a software registration. She has done postdoctoral stays at the Universities of Cassino, City University of London and Pontificia de Peru. She is associate editor of the journal Shock and Vibration and participates as a regular reviewer of the journals registered in JCR Mechanism and Machine Theory, Mechanical System and Signal Processing and the Journal of Vibration and Control. She has participated as a member of the evaluation committee of MINECO projects in the transportation area for two years.
Other data from SCOPUS: Total citations – 527, Average citations/year for the last 5 years (2017-2021), 73, Total publications in the first quartile (JCR - Q1), 17, Index h. 15

Part C. RELEVANT MERITS *(sorted by typology)*

C.1. Publications *(see instructions)*

1. Bustos, A., Rubio, H., Castejon, C., Garcia-Prada, J.C., Enhancement of chromatographic spectral technique applied to a high-speed train. Structural Control and Health Monitoring, 2021, 28(12), (Q1)
2. Corral, E., Moreno, R.G., García, M.J.G., Castejón, C., Nonlinear phenomena of contact in multibody systems dynamics: a review, Nonlinear Dynamics, 2021, 104(2), pp. 1269–1295 (Q1)
3. Soriano-Heras, E., Rubio, H., Bustos, A., Castejon, C. Mathematical analysis of the process forces effect on collet chuck holders, Mathematics, 2021, 9(5), pp. 1–21, 492 (Q1)
4. Gómez, M.J., Marklund, P., Strombergsson, D., Castejón, C., García-Prada, J.C., Analysis of Vibration Signals of Drivetrain Failures in Wind Turbines for Condition Monitoring, Experimental Techniques, 2021, 45(1), pp. 1–12 (Q3-T2)

5. Zamorano, M., Gómez Garcia, M.J., Castejón, C , Selection of a mother wavelet as identification pattern for the detection of cracks in shafts, JVC/Journal of Vibration and Control, 2021, Article in Press (Q1)
6. Sánchez, R.-V., Lucero, P., Macancela, J.-C., ...Cabrera, D., Castejón, C., Evaluation of time and frequency condition indicators from vibration signals for crack detection in railway axles, Applied Sciences (Switzerland)this link is disabled, 2020, 10(12), 4367 (Q1)
7. Gómez, M.J., Castejón, C., Corral, E., García-Prada, J.C., Railway axle condition monitoring technique based on wavelet packet transform features and support vector machines, Sensors (Switzerland), 2020, 20(12), pp. 1-18, 3575 (Q1)
8. Marichal, G.N., Ávila, D., Hernández, Á., Padrón, I., Castejón, C. Feature extraction from indirect monitoring in marine oil separation systems (2018) Sensors (Switzerland), 18 (9), art. no. 3159 (Q1)
9. Gómez García M.J.; Castejón, C.; García-Prada, J. C., Automatic condition monitoring system for crack detection in rotating machinery, Reliability Engineering and System Safety, 152, 239- 247, 0951-8320. 2016, (Q1)
10. Castejón, C.; García-Prada, J. C., Gómez García M.J.; Meneses, J., Automatic detection of cracked rotors combining multiresolution analysis and artificial neural networks, Journal of Vibration and Control, 21/15, 3047- 3060, 1077-5463. 2015, (Q2)

C.2. Congress (all contributions presented in this item correspond to oral presentations with publication)

1. Zamorano, M.; Gomez Garcia, M.J.; Castejon, C.; Corral E., *Analysis in the time-frequency domain of different depths of a crack located in a change of section of a shaft*, The 15th IFToMM World Congress, KRAKOW, POLONIA Date: 30/06-04/07, 2019
2. Bustos, A.; Rubio, H.; Meneses, J.; Castejon, C.; Garcia Prada, J. C., *Crack detection in freight railway axles using Power Spectral Density and Empirical Mode Decomposition Techniques*, The 15th IFToMM World Congress, KRAKOW,POLONIA Date:30/06-04/07, 2019
3. Bustos, A.; Rubio, H. ; Castejon, C. ; Garcia Prada, J. C., *Study of the vibratory behaviour of a High Speed Train bogie using the EMD technique*. Fourth International Conference on Railway Technology Railways 2018, SITGES, BARCELONA Date: 03-07 /09/2018
4. Bustos, A.; Rubio, H. ; Castejon, C. ; Garcia Prada, J. C., *Monitoring of a High-Speed Train Bogie Using the EMD Technique*, Condition Monitoring of Machinery in Non-stationary Operations (CMMNO 2018), SANTANDER, CANTABRIA Date: 20-22 /06/2018
5. Bustos, A.; Rubio, H. ; Castejon, C. ; Garcia Prada, J. C., *Operating state identification of a high-speed train with analysis of the vibration signal*, 1ª Conferencia de Dinámica Estructural DinEst 2018. UPM, Madrid Spain, Date: 20-21 /06/2018
6. Gomez Garcia M.J.; Corral E.; Castejon, C. ; Garcia Prada, J. C., *Incipient bearing fault diagnosis using WPT and ANN including parameter optimization*, 13th International Conference Mechatronic Systems and Materials, Vilnius, LITUANIA Date: 03-05 /07/2017
7. Garcia Prada, J. C. ; Castejon, C. ; Rubio, H. ; Bustos, A. *Methodology to characterize the Von Misses stress in the contact between wheel and rail(Test-Rig)*, 18th International Wheelset Congress, (IEEE IWC 2016), Chengdu, China Date: 07-11 /11/2016
8. Gomez Garcia M.J.; Castejon, C. ; Garcia Prada, J. C., Lopez Lopez J., *Experimental analysis and validation of a vibration-based technique for crack detection in a shaft*, 9Th IFTOMM International Conference on Rotor Dynamics, MILAN, ITALIA Date: 22-25 /09/2014
9. Kalengayi, Z.; Garcia Prada, J. C. ; Castejon, C. ; Gomez Garcia M.J., *Predicting the fatigue life of mechanical components using continuum damage mechanics (CDM): application to a railway axle*, 2nd International Conference of the International Journal of Structural Integrity, Madeira, Portugal Date: 01-04 /09/2014
10. Gomez Garcia M.J.; Castejon, C.; Garcia Prada, J. C., *New stopping criteria for crack detection during fatigue tests of railway axles.* Sixth International Conference On Engineering Failure Analysis. Lisboa, PORTUGAL Date: 06-09 /07/2014

C.3. Research projects

1. PID2020-116984RB-C22, Modelado y análisis del material rodante ferroviario orientado al mantenimiento conectado. AGENCIA ESTATAL DE INVESTIGACION (AEI), IP: Castejón C. y Meneses J., 01/09/2021 - 31/08/2024, 54.450 euros. IP (investigator-in-charge),
2. DPI2015-69325-C2-1-R, Sistema de monitorización integral de conjuntos mecánicos críticos para la mejora del mantenimiento en el transporte, MINISTERIO DE ASUNTOS ECONOMICOS Y TRANSFORMACION DIGITAL, Castejón, C., Garcia Prada, J. C., 01/01/2016- 31/12/2018, 117.128€, IP
3. CCG10-UC3M/DPI-4854, Metodología de diseño óptima para robots de servicio, COMUNIDAD DE MADRID-UC3M, 01/01/2011- 31/12/2011, 5.800€, IP
4. DPI2010-10693-E, EURAXLES: Minimizing the risk of fatigue failure of railway axles, MINISTERIO DE CIENCIA E INNOVACION, convocatoria AYUDA petición de proyectos europeos, GARCIA PRADA, J. C., 01/01/2011- 31/12/2011, 1.000€, researcher.
5. UE-FP7-TRANSPORT 265706, EURAXLES: Minimizing the risk of fatigue failure of railway axles, European Commission, Garcia Prada, J. C., 01/11/2010- 30/04/2014, 101.663,30€, researcher.

C.4. Contracts, technological or transfer merits

1. Art.83 LOU. Desarrollo de un modelo de rodamiento orientado al gemelo digital para la. monitorización en vehículos agrarios, John Deere Iberica, S.A. Castejón, C. Rubio H. 07/06/2021- 07/06/2022, 40.736,24 €
2. Art.83 LOU. Análisis y reconocimiento de patrones para la detección de defectos en ejes ferroviarios, SKF ESPAÑOLA S.A. Castejón C. 24/08/2020-24/02/2021, 8,099,17€
3. Art.83 LOU Sistema robotizado de actuación externa sobre elementos urbanos con accesibilidad reducida, FCC INDUSTRIAL E INFRAESTRUCTURAS ENERGETICAS, S.A.U., GARCIA PRADA, J. C. , CASTEJON, C. 05/2017-05/2018, 32.375,44€ - transfer of this research to a patent ES2759519A1 Sistema robótico y métodos para tareas de mantenimiento en farolas y estructuras verticales de forma cónica, (transferred to FCC IND E INFRAESTRUCTURAS ENERGETICAS S A U) participating as inventor
4. Art.83 LOU Simulación y Análisis por ordenador de Sistema Mecánicos: Aplicación a sistemas de elevación y transporte vertical, ZARDOYA OTIS, GARCIA PRADA, J. C. , CASTEJON, C., 28/04/2015- 27/04/2017, 43.387,50€.
5. Art.83 LOU Laboratorio de procesado avanzado de señales de vibración para ejes ferroviarios en operación , ALSTOM TRANSPORTE S.A., GARCIA PRADA, J. C. , CASTEJON, C. , 23/03/2015- 22/10/2015, 25.540€.
6. Art.83 LOU Laboratorio de técnicas avanzadas de análisis por vibraciones del estado de sistemas mecánicos rotativos de aplicación ferroviaria, SKF ESPAÑOLA, S.A., CASTEJON, C. , GARCIA PRADA, J. C. , 01/07/2012- 30/09/2015, 94.514,80€.
7. Project CDTI - Desarrollo de nuevas técnicas y metodologías para la mejora del mantenimiento de los ejes de ferrocarril ante el fallo por fatiga - RANKINE 21, DANOBAT RAILWAY SYSTEMS S.COOP., SKF ESPAÑOLA, S.A., IP: GARCIA PRADA, J. C., 01/11/2010- 31/08/2014, 246.530€. - transfer of this research to two patents: P201431966, Método para la detección de defectos de ejes ferroviarios en ensayos a fatiga, 30/12/2014 y P201430606, Método y sistema para detectar automáticamente fallos en un eje rotatorio, 24/04/2014, UNIVERSIDAD CARLOS III DE MADRID (transferred to ALSTOM TRANSPORTE S.A., SKF ESPAÑOLA S.A. y DANOBAT S. Coop.). participating as inventor
8. Patent. García-Prada, J. C.; Castejón, C., Meneses, J.; Álvarez M., P201630551, Rectoscopio, 29/04/2016, UC3M-IDIPAZ. (PCT/ES2017070249, WO2017186994, US16/096,462 EP17788865.8)
9. Patent. Castejón, C.; Meneses, J.; García-Prada, J. C.; Rubio, H.; Grillo E.; Vaño S.; Jaén P., P201331644, Dispositivo automático para biopsias cutáneas, 12/11/2013, UC3M-IRICYS (US20160354065-12/08/2016)