

Part A. PERSONAL INFORMATION

CV date

08/12/2020

First and Family name	JUAN CARLOS GARCIA PRADA		
Social Security, Passport, ID number	10054092X	Age	59
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0002-7793-8625	
	SCOPUS Author ID (*)	22234271800	
	WoS Researcher ID (*)	B-5225-2019	

(*) Optional

(**) Mandatory

A.1. Current position

Name of University/Institution	Universidad Nacional de Educación a Distancia		
Department	MECANICA / Escuela Técnica Superior de Ingenieros Industriales		
Address and Country	c./ Juan del Rosal, 12, Dpto. de Mecánica - ETSII - UNED, 28040, MADRID		
Phone number	(34) 629503029	E-mail	jcgprada@ind.uned.es
Current position	CATEDRATICO DE UNIVERSIDAD	From	15/05/2002 UC3M (excedencia) 27/09/2019 UNED
Key words	design, vibration and faults of machines. 331002 - Maquinaria industrial; 331003 - Procesos industriales; 331004 - Ingeniería de mantenimiento; 332305 - Material rodante		

A.2. Education

PhD, Licensed, Graduate	University	Year
Dr. en Prog. Oficial de Posgrado en Ing. mecánica	UNED-Escuela Técnica Superior de Ingenieros Industriales	1991
Ingeniero Industrial	UPM- Escuela Técnica Superior de Ingenieros Industriales	1985

A.3. General indicators of quality of scientific production (see instructions)

Chair Professor - mechanical engineering, Universidad Carlos III de Madrid

Chair Professor - mechanical engineering, Universidad Nacional de Educación a Distancia

PhD in the last ten years: 8 (6 co-directed).

Editor:

2013: New trends in mechanical engineering education
Editors: GARCIA-PRADA, J.C., Castejón, Cristina (Eds.).
ISBN 139783319018362

2017: New trends in educational activity in the field of mechanism and machine theory (2014-2017).
Editors: GARCIA-PRADA, J.C., Castejón, Cristina (Eds.).
ISBN 978-3-030-00107-0. International Standard Serial Number (ISSN). 2211-0984

2019 Editorial Coordinator of RIBIM Revista Iberoamericana de Ingeniería Mecánica. Editor UNED.

2016 3rd Students International Olympiad on MECHANISM AND MACHINE SCIENCE. Leganés – Madrid – España. Patroc. IFTOMM International Federation of Science of Machine and Mechanism.

2015 1º Olimpiada de máquinas y Mecanismos OTM². Leganés – Madrid – España. AEIM ASoc. Española de Ing. Mecánica.

Web of Science ResearcherID B-5225-2019

Patent.- 2 GARCIA PRADA, J. C.; CASTEJON, C.; MARIA JESUS GOMEZ GARCIA. ES2549652. : Método y sistema para detectar automáticamente fallos en un eje rotatorio España. 30/09/2016. Universidad Carlos III de Madrid.
Transf.: Alstom; SKF; Danobat.

2014-2019 (WOS – FECYT): Artículos : 8Q1, 10 Q2.

Publications 2005-2020: 104; Total times cited 528; H-index 14

Journals published in

(6) Mechanism and Machine Theory WOS;(4) Journal of Vibration and Control WOS; (4) Sensors WOS; (2) IEEE Transactions on Power Delivery WOS: (2) IFToMM World Congress Proceedings, IFToMM; (2) International Journal of Mechanics and Control.

Last six-year period granted in 2019 (3 six years granted). 2014-2019

Part B. CV SUMMARY (max. 3500 characters, including spaces)

In 2005, I founded the research group Maqlab - UC3M.

In 2019, I founded the research group Maqlab - UNED.

The Maqlab group, with almost 15 years of age, has maintained a constant line of research in the study of vibrations in machines applied to the study of the state of operation in industrial processes. This has resulted in, first of all, maintaining a group of researchers developing numerous theoretical and applied projects and obtaining competitive research projects both at the regional level in Madrid, nationally and Europeanly and with industry. This latest industrial commitment has been rewarded with a fruitful relationship with large companies that are committed to technological innovation and are tractors in their industrial line: ROCA, AMPER, RENFE, SKF, ALSTOM, DANOBAT, FCC, etc. Also, we have achieved main equipment and infrastructure to house our projects. Currently having a maintained productivity service to the industrial community in its research needs.

We need to highlight the BOGLAB Laboratory located in RENFE's Integral Maintenance base in Madrid that in collaboration with RENFE-SKF-ALSTOM and DANOBAT allows for dynamic tests of great complexity on Bogies (Y21, and others). This Laboratory was founded in 2010 and began its work in 2011 with the RANKINE 21 project. Also, we have assembled a BOGMOV rolling laboratory on an AVE train, with the help of RENFE and ALSTOM which has allowed to generate a database of the vibration behavior of a sensorized shaft in the grease boxes. The exploitation and post-processing of such data is providing us with a very important source of data for research. This Laboratory was founded in 2010 and began its work in 2011 with the RANKINE 21 project.

The Maqlab research group has coordinated with other Ing. Mecánica groups and departments to more efficiently address research projects. We can highlight the competitive projects obtained, i.e. 3 coordinated projects financed in convocation of the Ministry, as well as participation in a European project such as IP in UC3M.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

1 Artículo científico. BUSTOS, A.; et al. (4/4). 2019. Condition monitoring of critical mechanical elements through Graphical Representation of State Configurations and Chromogram of Bands of Frequency MEASUREMENT. 135, pp.71-82. ISSN 0263-2241.

2 Artículo científico. ZOSER KALENGAYI TSHILUMBU; et al. (6/6). 2018. Desarrollo de una

- metodología de detección de grietas de fatiga en ruedas ferroviarias basada en el análisis de frecuencias naturales *Técnica Industrial*. 320, pp.46-53. ISSN 0040-1838.
- 3 Artículo científico. PABLO IZQUIERDO; et al. (5/5). 2018. Dynamics and Embedded Internet of Things Input Shaping Control for Overhead Cranes Transporting Multibody Payloads *SENSORS*. 18/6. ISSN 1424-8220.
- 4 Artículo científico. MARIA JESUS GOMEZ GARCIA; et al. (4/4). 2018. Effective Crack Detection in Railway Axles Using Vibration Signals and WPT Energy *SENSORS*. 18/5. ISSN 1424-8220.
- 5 Artículo científico. BUSTOS, A.; et al. (4/4). 2018. EMD-Based Methodology for the Identification of a High-Speed Train Running in a Gear Operating State *SENSORS*. 18/3. ISSN 1424-8220.
- 6 Artículo científico. MENESES, J.; et al. (5/2). 2017. The Kinematics of the Rotary into Helical Gear Transmission *MECHANISM AND MACHINE THEORY*. 108, pp.110-122. ISSN 0094-114X.
- 8 Artículo científico. MARIA JESUS GOMEZ GARCIA; et al. (4/4). 2016. Analysis of the influence of crack location for diagnosis in rotating shafts based on 3 x energy *MECHANISM AND MACHINE THEORY*. 103, pp.167-173. ISSN 0094-114X.
- 9 Artículo científico. MARIA JESUS GOMEZ GARCIA; CASTEJON, C.; GARCIA PRADA, J. C.(3/3). 2016. Automatic condition monitoring system for crack detection in rotating machinery *RELIABILITY ENGINEERING & SYSTEM SAFETY*. 152, pp.239-247. ISSN 0951-8320.
- 10 Artículo científico. MARIA JESUS GOMEZ GARCIA; CASTEJON, C.; GARCIA PRADA, J. C.(3/3). 2016. Review of recent advances in the application of the wavelet transform to diagnose cracked rotors Algorithms. 9/1, pp.1-13. ISSN 1999-4893.
- 11 Artículo científico. MARIA JESUS GOMEZ GARCIA; CASTEJON, C.; GARCIA PRADA, J. C.(3/3). 2016. Crack detection in rotating shafts based on the 3x energy. Analytical and experimental analysis *MECHANISM AND MACHINE THEORY*. 96/1, pp.94-106. ISSN 0094-114X.
- 12 Artículo científico. CASTEJON, C.; et al. (4/2). 2015. Automatic detection of cracked rotors combining multiresolution analysis and artificial neural networks *JOURNAL OF VIBRATION AND CONTROL*. 21/15, pp.3047-3060. ISSN 1077-5463.
- 13 Artículo científico. MARIA JESUS GOMEZ GARCIA; CASTEJON, C.; GARCIA PRADA, J. C.(3/3). 2015. New stopping criteria for crack detection during fatigue tests of railway axles *ENGINEERING FAILURE ANALYSIS*. 56, pp.530-537. ISSN 1350-6307.
- 14 Artículo científico. CASTEJON, C.; et al. (5/3). 2015. Automatic selection of the WPT decomposition level for condition monitoring of rotor elements based on the sensitivity analysis of the wavelet energy *International Journal of Acoustics and Vibration*. 20/2, pp.95-100. ISSN 1027-5851.
- 15 Artículo científico. J. M. MARIN; et al. (4/3). 2014. Modeling and simulation of 5 and 11 DOF ball bearing system with localized defect *JOURNAL OF TESTING AND EVALUATION*. 42/1. ISSN 0090-3973.
- 16 Artículo científico. G. N. MARICHAL; et al. (4/3). 2011. Extraction of rules for faulty bearing classification by a Neuro-Fuzzy approach *MECHANICAL SYSTEMS AND SIGNAL PROCESSING*. 25/6, pp.2073-2082. ISSN 0888-3270.
- 17 Artículo científico. CARLOS MARICHAL SALINAS; M. ARTES; GARCIA PRADA, J. C.(3/3). 2011. An intelligent system for faulty-bearing detection based on vibration spectra *JOURNAL OF VIBRATION AND CONTROL*. 17/6, pp.931-942. ISSN 1077-5463.
- 18 Artículo científico. DAVID MAURICIO ALBA LUCERO; et al. (4/2). 2010. Center of Percussion and Gait Design of Biped Robots *MECHANISM AND MACHINE THEORY*. 45/11, pp.1681-1693. ISSN 0094-114X.
- 19 Artículo científico. EDWIN RIVAS TRUJILLO; BURGOS, J. C.; GARCIA PRADA, J. C.(3/3). 2010. Vibration Analysis using Envelope Wavelet for detecting Faults in the OLTC Tap Selector *IEEE TRANSACTIONS ON POWER DELIVERY*. 25/3, pp.1629-1636. ISSN 0885-8977.
- 21 Artículo científico. CASTEJON, C.; OMAR JOSE LARA CASTRO; GARCIA PRADA,

J. C.(3/3). 2010. Automated Diagnosis of Rolling Bearings using MRA and Neural Networks MECHANICAL SYSTEMS AND SIGNAL PROCESSING. 24/1, pp.289-299. ISSN 0888-3270.

22 Artículo científico. EDWIN RIVAS TRUJILLO; BURGOS, J. C.; GARCIA PRADA, J. C.(3/3). 2009. Condition Assessment of Power OLTC by Vibration Analysis Using Wavelet Transform IEEE TRANSACTIONS ON POWER DELIVERY. 24/2, pp.687-694. ISSN 0885-8977.

23 Capítulo de libro. BUSTOS, A.; et al. (4/4). 2017. Railway linkage mechanism analysis through parallel computing 13º Congresso Ibero-americano de Engenharia Mecânica / Ingeniería Mecánica. Livro de actas. ISBN 978-989-95683-4-1.

24 Capítulo de libro. MARIA JESUS GOMEZ GARCIA; CASTEJON, C.; GARCIA PRADA, J. C.(3/3). 2014. Incipient Fault Detection in Bearings Through the use of WPT Energy and Neural Networks Advances in Condition Monitoring of Machinery in Non-Stationary Operations, Lecture Notes in Mechanical Engineering. SPRINGER. pp.63-72. ISBN 978-3-642-39348.

C.2. Research projects

1 DPI2015-69325-C2-1-R, Sistema de monitorización integral de conjuntos mecánicos críticos para la mejora del mantenimiento en el transporte MINISTERIO DE ECONOMIA Y EMPRESA. CASTEJON, C.(Universidad Carlos III de Madrid). 01/01/2016-31/12/2019. 117.128 €.

2 265706, EURAXLES: Minimizing the risk of fatigue failure of railway axles EUROPEAN COMMISSION RESEARCH EXECUTIVE AGENCY. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 01/11/2010-30/04/2014. 101.663,3 €.

3 DPI2010-10693-E, EURAXLES: Minimizing the risk of fatigue failure of railway axles MINISTERIO DE CIENCIA E INNOVACION. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 01/01/2011-31/12/2011. 1.000 €.

4 SISTEMA DE MONITORIZACION INTEGRAL DE CONJUNTOS MECANICOS CRÍTICOS PARA LA MEJORA DEL MANTENIMIENTO EN EL TRANSPORTE

C.3. Contracts, technological or transfer merits

0 LABORATORIO DE TÉCNICAS AVANZADAS DE ANÁLISIS DEL ESTADO DE SISTEMAS MECÁNICOS: ANÁLISIS Y PROCESADO DE SEÑALES DE VIBRACIÓN DEL BANCO DE ENSAYOS DE EJES FERROVIARIOS BU300- LUCCHINI-RS. GARCIA PRADA, J. C. **UNED**. 09/01/2019-31/12/2020. 60.000 €.

3 Simulación comportamiento dinámico Bogie reducido PR1-4600086180 ALSTOM TRANSPORTE S.A.. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 19/12/2016-P3M. 1.833,69 €.

4 Laboratorio de procesamiento avanzado de señales de vibración para ejes ferroviarios en operación ALSTOM TRANSPORTE S.A.. CASTEJON, C.(Universidad Carlos III de Madrid). 23/03/2015-P7M. 25.540 €.

5 Laboratorio de técnicas avanzadas de análisis por vibraciones del estado de sistemas mecánicos rotativos de aplicación ferroviaria SKF ESPAÑOLA, S.A.. CASTEJON, C.(Universidad Carlos III de Madrid). 01/07/2012-P3Y3M. 94.514,8 €.

6 Cátedra LGN Tech Design BULTACO MOTOR, S.L.. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 04/11/2010-P2Y4M28D. 2.000 €.

7 Desarrollo de nuevas técnicas y metodologías para la mejora del mantenimiento de los ejes de ferrocarril ante el fallo por fatiga - RANKINE 21 ALSTOM TRANSPORTE S.A.. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 01/11/2010-P3Y10M. 111.530 €.

8 Desarrollo de nuevas técnicas y metodologías para la mejora del mantenimiento de los ejes de ferrocarril ante el fallo por fatiga - RANKINE 21 SKF ESPAÑOLA, S.A.. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 01/11/2010-P3Y10M. 50.700 €.

9 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. GARCIA PRADA, J. C.(Universidad Carlos III de Madrid). 01/11/2010-
P3Y10M. 84.300 €.

C.4. Patents

2 GARCIA PRADA, J. C.; CASTEJON, C.; MARIA JESUS GOMEZ

GARCIA. ES2549652. : Método y sistema para detectar automáticamente fallos en un eje
rotatorio España. 30/09/2016. Universidad Carlos III de Madrid.

Transf.: Alstom; SKF; Danobat.

GARCIA PRADA, J. C.; CASTEJON, C.; MARIA JESUS GOMEZ . 2 759 519: Sistema robótico y métodos
para tareas de mantenimiento en farolas y estructuras verticales de forma cónica. 09/10/2020.
UC3M.

Transf.:FCC INDUSTRIAL E INFRAESTRUCTURAS ENERGÉTICAS.

6 ENRIQUE SORIANO HERAS; RUBIO, H.; GARCIA PRADA, J. C.; JOSE LUIS PEREZ

DIAZ. P201131324. Sistema neumático de detección de presencia y posicionado de pieza
para procesos automáticos. España. 28/07/2014. Universidad Carlos III de Madrid.

Transf.: Elementos Mecánicos Europeos.

7 JOSE GERMAN PEREZ ALONSO; GARCIA PRADA, J. C.; JOSE LUIS PEREZ

DIAZ. P201000264. Método y dispositivo para evitar el bloqueo de la rueda
trasera motriz en motocicletas o vehículos similares con transmisión de tipo cardan.

España. 15/11/2012. Universidad Carlos III de Madrid. Transf.: Bultaco Electric ; Lgn Tech Design.