

Part A. PERSONAL INFORMATION

CV date

03-10-2022

First name	Joaquín		
Family name	Ojeda Granja		

(*) Mandatory

A.1. Current position

Position	Profesor Titular de Universidad		
Initial date	24/05/2021		
Institution	Universidad de Sevilla		
Department/Center	Mechanical Engineering and Manufacturing	Escuela Técnica Superior de Ingeniería	
Country	Spain		
Key words	Biomechanics, Motion Analysis, Multibody System Dynamics		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
2009-2010	Becario FPI/Universidad de Sevilla/Spain
2010-2013	Profesor Ayudante/Universidad de Sevilla/Spain
2013-2018	Profesor Ayudante Doctor/Universidad de Sevilla/Spain
2018-2019	Profesor Contratado Doctor Interino/Universidad de Sevilla/Spain
2019-2021	Profesor Contratado Doctor/Universidad de Sevilla/Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Industrial Engineer	Universidad de Sevilla	2007
Master Degree	Universidad de Sevilla	2008
PhD Degree	Universidad de Sevilla	2012

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

I started my research career in the field of Biomechanics by doing my final year project on internal bone remodelling. As a result of this work, I was awarded the first prize for the best end of degree project by the Association of Industrial Engineers of Western Andalusia in 2007. That same year, I obtained a FPI grant to do my doctoral thesis with Professor Juana Mayo also in the field of Biomechanics but with a different topic: the application of multi-body systems techniques to the analysis of human gait. I carried out two pre-doctoral stays. The first was at the University of Stuttgart under the direction of Peter Heberhard in 2008 for a duration of 6 months. This world-famous researcher directed me to work on the biomechanics of the middle

ear in guinea pigs. The result of this research was an in-depth knowledge of multi-body systems techniques applied to Biomechanics. The second research stay was at the Human Performance Lab of the University of Calgary under the supervision of Dr. Benno Nigg in 2010 for a duration of 5 months working on experimental techniques of motion capture and principal component analysis applied to human walking. In 2012 I completed my doctoral thesis with mention of international and won second prize for the best doctoral thesis awarded by the National Association of Mechanical Engineering. In 2014 I obtained a scholarship to carry out a research stay at the University of Trujillo, Peru, to develop models of contact between the foot and the ground. Because of this stay I was published in an international congress. In the year 2015 a new line of research was initiated that tried to apply the techniques of movement analysis to cycling. The result of this work was the obtaining of state funding to develop a research project in this field, of which I was the main researcher. In November 2015 I was elected as a member of the governing committee of the Spanish Chapter of the European Society for Biomechanics, a position I have held until 2019; the last two years as president.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

Martín-Sosa, E., Chaves, V., Soler-Vizán, E., Mayo, J., Ojeda, J. Methodology to analyse three-dimensional asymmetries in the forces applied to the pedals in cycling. *Annals of Biomedical Engineering*. September 2022. <https://doi.org/10.1007/s10439-022-03076-y>. BIOMEDICAL ENGINEERING Q2. N° Cites: 0.

Calvo-Gallego, J.L., Gutiérrez-Millán, F., Ojeda, J., Pérez, M.A., Reina, J.M. The correlation between bone density and mechanical variables in bone remodelling models: Insights from a case study corresponding to the femur of a healthy adult. *Mathematics*. September 2022. <https://doi.org/10.3390/math10183367>. MATHEMATICS D1. N° Cites: 0.

Martín-Sosa, E., Chaves, V., Alvarado, I., Mayo, J., Ojeda, J. 2021. Design and validation of a device attached to a conventional bicycle to measure the three-dimensional forces applied to a pedal. *Sensors*. 21: 4590. <https://doi.org/10.3390/s21134590>. INSTRUMENTS & INSTRUMENTATION Q1. N° Cites: 1.

Mayo, J., Ojeda, J. 2020. Influence of the kinematic constraints on dynamic residuals in inverse dynamic analysis during human gait without using force plates. *Multibody System Dynamics*. 50: 305-321. DOI: 10.1007/s11044-020-09739-9. MECHANICS Q2. N° Cites: 1.

Martín-Sosa, E., Martínez-Reina, J., Mayo, J., Ojeda, J. 2019. Influence of musculotendon geometry variability in muscle forces and hip bone-on-bone forces during walking. *PLoS ONE*. 14(9): e0222491. <https://doi.org/10.1371/journal.pone.0222491>. MULTIDISCIPLINARY SCIENCE Q2. N° Cites: 2.

Ojeda, J., Mayo, J. 2019. A procedure to estimate normal and friction contact parameters in the stance phase of the human gait. *Computer Methods in Biomechanics and Biomedical Engineering*. 22(8): 840-852. DOI: 10.1080/10255842.2019.1599363. COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS Q3. N° Cites: 2.

Ridao-Fernández, C., Ojeda, J., Chamorro-Moriana, G. 2018. Analysis of Spatial and Temporal Step Parameters during Crutch-Assisted Gait as a Dual-Task: A Pilot Study. *Journal of Biomechanical Engineering*. 140(10):101006. DOI: 10.1115/1.4040020. ENGINEERING, BIOMEDICAL Q3. N° Cites: 2.

Ridao-Fernández, C., Chamorro-Moriana, G., Ojeda, J. 2018. Influence of the load exerted over a forearm crutch in spatiotemporal step parameters during assisted gait: Pilot study. *Biomedical Engineering Online*. 17: 98. <https://doi.org/10.1186/s12938-018-0527-z> ENGINEERING, BIOMEDICAL Q3. Nº Cites: 2.

M.S.Commisso, J.Ojeda, J.Mayo, J.Martínez-Reina. 2018. Influence of the Temporomandibular Joint in the Estimation of Bone Density in the Mandible through a Bone Remodelling Model. *Mathematical Problems in Engineering*: 7243696 DOI: 10.1155/2018/7243696. ENGINEERING, MULTIDISCIPLINARY Q3. Nº Cites: 1.

Chamorro-Moriana, G., Ridao-Fernández, C., Ojeda, J., Benítez-Lugo, M., Sevillano, J.L. 2016. Reliability and validity study of the Chamorro Assisted gait Scale for people with sprained ankles, walking with forearm crutches. *PLoS ONE*. 11(5): e0155225. MULTIDISCIPLINARY SCIENCE Q1. Nº Cites: 17.

Ojeda, J., Martínez-Reina, J.M., Mayo, J. 2016. The effect of kinematic constraints in the inverse dynamics problema in biomechanics. *Multibody System Dynamics*. 37:291–309. MECHANICS Q1. Nº Cites: 22.

Martínez-Reina, J.M., Ojeda, J., Mayo, J. 2016. On the use of bone remodelling models to estimate the density distribution of bones. Uniqueness of the solution. *PLOS ONE* 11(2): e0148603. MULTIDISCIPLINARY SCIENCE Q1. Nº Cites: 17.

Commisso, MS, Martinez-reina, J, Ojeda, J, Mayo, J. 2015. Finite element analysis of the human mastication cycle. *Journal of the Mechanical Behavior of Biomedical Materials*. 41: 23-35. ENGINEERING, BIOMEDICAL Q1. Nº Cites: 50.

C.2. Congress

Martín-Sosa, E., Mayo, J., Ojeda, J. Oral presentation. Metodología para la resolución del problema dinámico inverso tridimensional en la práctica del ciclismo. X Reunión del Capítulo Español de la Sociedad Europea de Biomecánica (ESB), 25 - 26 de octubre 2021, Granada, Spain.

Martín-Sosa, E., Soler-Vizán, E., Mayo, J., Ojeda, J. Oral presentation. Optimization of the cycling kinematic analysis. Methodology comparative. 26th Congress of the European Society of Biomechanics, July 11-14, 2021, Milan, Italy.

Martín-Sosa, E., Chaves, V., Alvarado, A., Mayo, J., Ojeda, J. Oral presentation. Análisis de simetrías en las fuerzas 3D de pedaleo mediante un dispositivo de bajo coste. XXIII Congreso Nacional de Ingeniería Mecánica, 2-4 de junio, 2021, Jaén, Spain.

Ojeda, J., Morales, J., Mayo, J. Oral presentation. Influence of different body pose reconstruction methods in the solution of the inverse dynamic problem during human gait without force plates. The 5th Joint International Conference on Multibody System Dynamics, June 24 – 28, 2018, Lisboa, Portugal.

Chamorro-Moriana, G., Ojeda, J., Ridao-Fernandez, C. Oral presentation. Influence of the loads applied to forearm crutches in the biomechanics of unilateral assisted gait: Pilot study. XXIII Congress of the European Society of Biomechanics, July 2-5, 2017, Sevilla, Spain.

Ojeda, J., Mayo, J. Oral presentation. Analysis of the foot-ground contact problem during human gait using the multi-segment oxford foot model. The 4th Joint International Conference on Multibody System Dynamics, May 5 - June 2, 2016, Montreal, Canada.

Ojeda, J., Infantes, D., Mayo, J. Oral presentation. Analysis of friction models applied to the ground reaction forces during human gait. ECCOMAS Thematic Conference on Multibody Dynamics, June 29 - July 2, 2015, Barcelona, Spain.

C.3. Research projects

Title: Design of a test bench for the optimisation of kinematics and kinetics in cycling (DPI2016-80796-P). Funding entity: Ministry of Science and Innovation. Universidad de Sevilla. Principal Investigator 1: Joaquín Ojeda Granja. Principal Investigator 2: Juana Mayo Núñez. Duration: 4 years. Amount: 151.855

Title: Spanish Network of Research in Biomechanics (DPI2017-90572-REDT). Funding entity: Ministry of Economy and Competitiveness. Principal Investigator: Josep Maria Font Llagunes. Duration: 2 years. Amount: 8.000. Role developed: researcher. Dedication: complete

Title: Predictive gait analysis including a multi-segment model of the foot for clinical application (DPI2013-44371-P). Funding entity: Ministry of Science and Innovation. Universidad de Sevilla. Principal Investigator: Juana Mayo Núñez. Duration: 4 years. Amount: 60000 euros. Role developed: collaborating researcher. Dedication: complete.

C.4. Contracts, technological or transfer merits

C.4.1. Contracts.

Title: Analysis of the mechanical design, elaboration of the structural design, dynamic analysis and advice in the construction and testing of the bioethanol processing system. Funding entity: Abengoa Hidrógeno. Participants: Association for Research and Industrial Cooperation of Andalusia (AICIA). Duration: 10-2013, 12-2016. Principal Investigator: Jaime Domínguez Abascal. Role developed: collaborating researcher. Dedication: partial.

Title: Análisis de posibles causas de fallo del convertidor nº 2. Funding entity: Atlantic Copper. Participants: Association for Research and Industrial Cooperation of Andalusia (AICIA). Duration: 04-2019, 05-2021. Principal Investigator: Jaime Domínguez Abascal. Role developed: collaborating researcher. Dedication: full.

C.4.2. Technological merits

Duran Granado, A., Alvarado Aldea, I., Chaves Repiso, V., Mayo Núñez, J., Ojeda Granja, J. (2021). Dispositivo para la medición de fuerza tridimensional aplicada en pedales. (España, nº de modelo de utilidad: ES1278679). Oficina Española de Patentes y Marcas.