MINISTERIO DE CIENCIA E INNOVACIÓN

CURRICULUM VITAE (maximum 4 pages)

CV date	26-06-2023

Part A. PERSONAL INFORMATION

First name	Cecilia Elisabet		
Family name	García Cena		
Gender (*)	Female	Birth date (dd/mm/yyyy)	
ID number			
e-mail	Cecilia.garcia@upm.es	URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-1067-0564	

A.1. Current position

Position	Associated Professor		
Initial date	03/10/2006		
Institution	Universidad Politécnica de Madrid		
Department/Center	ETSIDI - CAR	etsidi.upm.es	
Country	Spain	Teleph. number	34-605122476
Key words	Medical Robotics, Kinematics, Control, Dynamics		

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

Period	Position/Institution/Country/Interruption cause
2001 - 2003	Postdoctoral research position. UPM.
2004 - 2006	Visiting Professor at Universidad Carlos III de Madrid (interrupted once by pregnancy)

A.3. Education

Electromechanical Eng,	Universidad Nac. de La Pampa (Argentina)	1996
Industrial Engineer	Spanish Education and Science Minister	2004
Control System Program	Universidad Nacional de San Juan (Argentina)	2001
PhD Degree	Spanish Education and Science Minister	2005

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

I am an Associate Professor in the Department of Electrical, Electronic, Automatic and Applied Physics Engineering at Universidad Politecnica de Madrid (UPM), Spain (2006-present) and the Deputy Director of Research and Doctorate program at the Higher Technical School of Engineering and Industrial Design, UPM, Spain (2021-present), as well as visiting professor at Beihang University, China (2019-present).

I received my B.S. degree in Electromechanical Engineering with the specialty in Industrial Automation (1997) from the National University of La Pampa, Argentina, and my PhD in Control Systems with focus on robotic system (2001) from the National University of San Juan, Argentina. In 2001, I was a postdoctoral researcher in the Automation and Robotics Lab at UPM and in 2004 I was a Visiting Professor with the Robotics Laboratory at Universidad Carlos III of Madrid. I have the intellectual property of 5 patents (one of them licensed internationally), have published more than 35 articles in journals of high impact, 40 conference articles, 4 books and have participated in 20 competitive research projects, being the principal investigator in 2 of them. I have been the adviser of more than 30 graduate students at master and PhD level. Additionally, I have been an external evaluator for the European Commission in the Horizon 2020 and Horizon Europe programs, both in research and innovation projects in the areas of robotics and artificial intelligence (2016-present). My main research interests include telerobotics, assistant robots, control of multi-agent systems and medical devices. In 2014, I received a national award for the best innovation technology in medical area. I have been working on the development of medical technologies with the inclusion of artificial intelligence and machine learning techniques that can assist in the medical field to diagnose a cognitive impairment and other sensorimotor disorders. I was the founder and advisor of a spinoff company, Aura Innovative Robotics, and was used as a platform for the commercialization of the developments based on the research results. I have a strong international activity. Since 2016 she is working as expert evaluator for the European Union in Research and Innovation Projects as well as for Innovation Projects. Since 2020, I am visiting professor for Beihang University, Beijing, China.

Part C. RELEVANT MERITS

As summary. She has more than 45 JCR articles, more than 50 articles in conferences national and international, she has been edited 4 books with very prestigious editorial groups. and has participated

in 25 research projects. She advised 6 PhD thesis. She founded a company. Currently her H-Index is 12.

C.1. Publications (including books)

1. Puglisi L., Saltaren Pazmiño R., **Cecilia E. García Cena**, Cardenas P., Moreno H. "Implementation of a Generic Constraint Function to Solve the Direct Kinematics of Parallel Manipulators Using Newton-Raphson Approach". Journal of Control Engineering and Applied Informatics. Vol 19, Num 2. Mayo 2017. Factor de Impacto (2016): 0.449. Ranking: **Q4.**
2. S. Álvarez de Miguel, G. Mollocana Lara, **Cecilia E. García Ce**na, M. Romero, J.M. García de María and J. González-Aguilar. Identification Model and PI & PID-Controller Design for a Novel Electric Air Heater. Automatika Journal (2017). Factor de Impacto (2016): 0.311. Ranking: **Q4.**
3. E. Hernández, S. Hernández, D. Molina, R. Acebrón, and **Cecilia E. García Cena**. OSCANN: Technical Characterization of a Novel Gaze Tracking Analyzer. Sensors (2018), 18(2), 522. Factor de Impacto: 2.475. **Q2**.
4. M. A. Destarac, **Cecilia E. García Cena**, J. García, R. Espinoza and R. J. Saltarén. Orte: Upper Limb Rehabilitation Robot. Biomechanical Analysis of Human Movements. IEEE Latin American Transaction (2018). Factor de Impacto (2016): 0.436. Ranking: **Q4**
5. A. J. Larrazabal, **Cecilia E. García Cena** y C. E. Martinez Video-oculography eye tracking towards clinics applications: a review. Journal on Computer Biology and Medicine. Vol. 18. Pp. 57-66. https://doi.org/10.1016/j.compbiomed.2019.03.025. (2019). Factor de Impacto: 2.286. **Q2.**
6. M. Cardona, **Cecilia E. García Cena**. Biomechanical Analysis of the Lower Limb: A Full-Body Musculoskeletal Model for Muscle-Driven Simulation. IEEE Access (2019). Vol 7. Pp: 92709 – 92723. Factor de Impacto. 4.098. **Q1**
7. M. Cardona, **Cecilia E. García Cena**, F. Serrano and R. Saltaren. ALICE: Conceptual Development of a Lower Limb Exoskeleton Robot Driven by an On-Board Muscoloskeletal Simulator. Sensors. Special Issue on Mechanical Sensors. (2020). Factor de Impacto 3.031. **Q1**
8. **Cecilia E. García Cena**, David Gómez Andrés and Irene Pulido Valdeolivas. Measurement and Analysis of Eye Movements Performance to Predict Healthy Brain Aging. IEEE Access. Vol. 8, pp 1-13. 2020. Factor de Impacto: 4.098. **Q1**
9. C. Lage,….., **Cecilia E. García Cena**, P. Sanchez Juan, Oculomotor behaviour in the differential diagnosis of Alzheimer's disease and frontotemporal dementia. Frontier of Neurology. 04 February 2021. Factor de Impacto: 4,364. **Q1**
10. Oz Yakrangi, Roque J. Saltarén Pazmiño, Juan S. Cely, Alejandro Rodríguez, **Cecilia E. García Cena**, Pablo San Segundo Carrillo, Julio De La Cueva, and Amir Shapiro. An Intelligent Algorithm for Decision Making System and Control of the GEMMA Guide Paradigm Using the Fuzzy Petri Nets Approach. MDPI Electronics. (2021) Impact factor 2.412. **Q2**.
11. Guerrero-Molina MP, Rodriguez-López C, Panadés-de Oliveira L, Uriarte-Pérez de Urabayen D, Garzo-Caldas N, **García-Cena CE**, Saiz-Díaz RA, Benito-León J, Gonzalez de la Aleja J. Antisaccades and memory-guided saccades in genetic generalized epilepsy and temporal lobe epilepsy. Epilepsy Behav. 2021 Aug 19;123:108236. doi: 10.1016/j.yebeh.2021.108236. Epub ahead of print. PMID: 34419714. (2021) Impact factor 2.937. **Q2**
12. **Cecilia E. Garcia Cena**, et.al. Eye Movement Alterations in Post-COVID-19 Condition: A Proof-of-Concept Study. Sensors. Special Issue: Wearable Technologies and Applications for Eye Tracking. 22(4) 1481-1496. Feb. 2022, https://doi.org/10.3390/s22041481 Impact Factor: 3.576. **Q1**.
13. F. Casanova-Ferrer, **Cecilia E. García Cena**, et.al. Minimal hepatic encephalopathy is associated to alterations in eye movements. Scientific Reports. Accepted 22/09/2022. Factor de Impacto: 4,996. **Q2**.
14. **Cecilia E. Garcia Cena**, et.al., Toward an Automatic Assessment of Cognitive Dysfunction in Relapsing-Remitting Multiple Sclerosis Patients Using Eye Movement Analysis. DOI: 10.3390/s22218220. Monitoring Technologies in Healthcare Applications. Sensors. Factor de Impacto (2022) 3,847. Q2. CiteScore: 6.5 Q1
15. M. A. Perez Baya, J. S. Cely, **Cecilia E. Garcia Cena**, A. Sintov and R. Saltarén. Method to develop legs for underwater robots: from multibody dynamics with experimental data to mechatronic implementation. https://doi.org/10.3390/s22218462. Accepted to be published in Sensors Electronics. Impact factor.3.847 Q2.

16. J. S. Cely, M. A. Perez Baya, M. Carpio, **Cecilia E. Garcia Cena**, A. Sintov and R. Saltarén. Control Strategy of an Underactuated Underwater Drone-Shape Robot for Grasping Tasks. https://doi.org/10.3390/s22228828. Accepted to be published in Sensors Electronics. Impact factor.3.847 Q2.
17. D. Sosa Mendez and **Cecilia E. García Cena**. Robotic digital twin as a training platform for rehabilitation health personnel. Enfoque UTE. e-ISSN: 1390-6542. Aceptado. 2023. Factor de Impacto: 0.13. Q4
18. **Cecilia E. Garcia Cena**, et al., Internet of medical things. Measurement of respiratory dynamics using wearable sensors in post-COVID-19 patients. Enfoque UTE. e-ISSN: 1390-6542. Aceptado. 2023. Factor de Impacto: 0.13. Q4

C.2. Congress

1. Marie André Destarac, **Cecilia E. García Cena**, Roque Saltarén Pazmiño and Rafael Aracil. "Kinematic and Kinetic simulation of Upper Brachial Plexus Injury in the Arm Rotation". Proc. Open Conference on Future Trends in Robotics. ISBN: 978-84-608-8452-1. Pp. 11-18. Madrid, Spain. Fecha: 09/16.
2. Luis J. Monge, Marie André Destarac, **Cecilia E. García Cena** and Santiago Hernández. "Modelling and Simulation of servomotors for a Rehabilitation Exoskeleton". Proc. of Open Conference on Future Trends in Robotics. ISBN: 978-84-608-8452-1. Pp. 29-36. Madrid, Spain. Fecha: 09/16.
3. Marie André Destarac, **Cecilia E. García Cena**, Adrián Mérida Martínez, Luis J. Monge Chamorro and Roque Saltarén Pazmiño. "Analysis of the Influence of External Actuators on the Glenohumeral Joint movements". LACAR, Latin American Congress on Robotics and Automation. Ciudad de Panamá, Panamá. Fecha: 02/17. Ed. Springer International Publishing.
4. Jorge García Montaño, **Cecilia E. García Cena**, Luis J. Monge Chamorro, Marie André Destarac and Roque Saltarén Pazmiño. "Mechanical Design of a Robotic Exoskeleton for Upper Limb Rehabilitation". LACAR, Advances in Automation and Robotics Research in Latin American. Ciudad de Panamá, Panamá. Fecha: 02/17. Ed. Springer International Publishing.
5. Experimental Identification of Lu-Gre Friction Model in an Hydraulic Actuator. L Puglisi, R. Saltarén and **Cecilia E. García Cena**. LACAR, Advances in Automation and Robotics Research in Latin American. Ciudad de Panamá, Panamá. Fecha: 02/17. Ed. Springer International Publishing.
6. Eye corners tracking for head movement estimation. A. Larrazabal**, Cecilia E. García Cena** y Cesar E. Martinez. IEEE International Work Conference on Bioinspired Intelligence. Budapest. Hungría. (2019). Julio 3-5 pp. 53-58.
7. Musculoskeletal Modeling as a Tool for Biomechanical Analysis of Normal and Pathological Gait. M. Cardona y **Cecilia E. Garcia Cena** (2019). VIII Congreso Latinoamericano de Ingeniería Biomédica. Mexico. Pp. 955-963. **Award to the best paper**.
8. Direct Kinematics and Jacobian Analysis of Exoskeleton Robots using Screw Theory and Simscape Multibody.M. Cardona and **Cecilia E. García Cena** (2019). IEEE CONCAPAN 2019.
9. Eye corner tracker for head movement estimation. Larrazabal A., **Cecilia E García Cena** and C. Martinez. 14th Women in Machine Learning Workshop WiML, Vancouver Canada (2019).

C.2. Research projects and grants

Título del proyecto: Robot actuado por cables para investigar y desarrollar control cinemático y dinámico de sistemas robotizados en baja gravedad. Aplicación a robots humanoides submarinos.
Entidad financiadora: MINECO. DPI2014-57220-C2-1-P.
Entidades participantes: Centro de Automática y Robótica UPM.
Duración: desde: 01/12/2015 hasta: 31/12/2018
Investigador responsable: Prof. Dr. Roque Saltarén Pazmiño por la Univ. Politécnica de Madrid
Número de investigadores participantes: 6

Título del proyecto: Desarrollo práctico y experimental de un modelo de control basado en comportamientos innatos aplicados a robots.
Entidad financiadora: MINECO. "Explora la Ciencia".DPI2013-49527-EXP
Entidades participantes: Centro de Automática y Robótica UPM.
Duración, desde: 01/12/2015 hasta: 31/12/2017

Investigador responsable: Prof. Dr. Roque Saltarén Pazmiño por la Univ. Politécnica de Madrid
Número de investigadores participantes: 6

Título del proyecto: Desarrollo de una plataforma para movilidad del miembro superior basada en la excitación de los puntos motores.
Entidad financiadora: Universidad Politécnica de Madrid
Duración, desde: 01/01/2016 hasta: 31/12/2016
Investigador responsable: **Prof. Dra. Cecilia E. García Cena**
Número de investigadores participantes: 7

Título del proyecto: MASTERPLAN FOR OPS IN SPANISH PORTS.
Entidad financiadora: EUROPEAN COMISSION. 2015-EU-TM-0417-S
Duración, desde: 01/11/2016 hasta: 31/12/2019
Investigador responsable: **Prof. Roque Saltarén**
Número de socios participantes: 15

Título del proyecto: Underwater Hybrid Legged Robot for research on kinematics, dynamics and control during the locomotion on the seabed.
Entidad financiadora: Min. de Ciencia, Innovación y Universidades. Ref. Nº PGC2018-095939-B-I00
Duración: desde: 06/05/2019 hasta: 31/12/2022
Investigador responsable: **Cecilia García Cena y Roque Saltarén.**
Número de socios participantes: 15

Título del proyecto: SAUSS. SELF-AWARE UNDERGROUND SENSORY SYSTEM SAUSS
Entidad financiadora: Min. de Ciencia, Innovación y Universidades. EIN2020-112482
Duración: desde: 01/02/2021 hasta: 31/12/2021
Investigador responsable: **Cecilia García Cena.**
Número de socios participantes: 3

C.4. Contracts, technological or transfer merits

Researchers (p.o. de firma): Maria Urdaneta Lima, **Cecilia García Cena** y Roque Saltarén Pazmiño
Title: Aparato para la inspección de tuberías
Ref. Numbet: P201131691 Priority: España Data: 29/03/2013
Owner: Universidad Politécnica de Madrid

Researchers (p.o. de firma): Roque Saltarén Pazmiño, **Cecilia García Cena** y Rafael Aracil Santonja
Title: Sistema Paralelo de 4 DoF para apuntar y guiar Dispositivos hacia Dianas Distales
Ref. Numbet: P 6988/2013 Priority: España Data: 11/11/2013
Owner: Universidad Politécnica de Madrid

Researchers (p.o. de firma): Antonio Martín González, **Cecilia García Cena** y Basil M. Al Hadithi
Title: Mecanismo electrónico localizador de lesiones no palpables en mamografía
Ref. Numbet: P 5159/2014 Priority: España Data de solicitud: 2014
Owners: Universidad Politécnica de Madrid y Hospital Universitario 12 de Octubre
Extended to: PCT
Exploited by: Hospital Universitario 12 de Octubre

Researchers: (p.o. de firma) **Cecilia E. García Cena**, David Gómez Andrés, Irene Pulido Valdeoliva, Rafel Acebrón López, Ricardo Espinoza Gómez, Sara Ramos Vázquez.
Title: Device for synchronized measuring of eye and head movement.
Núm. de solicitud: EP16382202.6 Data de prioridad: 29/11/2016
Owner: Aura Innovative Robotics SL y Universidad Politécnica de Madrid.
Extended to: PCT
Exploited by: Aura Innovative Robotics SL

Researchers: (p.o. de firma) Roque Saltarén Pazmiño, **Cecilia E. García Cena,** Juan Cely y José Manuel Angosto.
Title: Sistema de generación y transmisión de potencia mecánica para accionamiento de actuadores hidráulicos remotos.
Núm. de solicitud: ES2884499 A1 Data de prioridad: 10/12/2021
Owner: Universidad Politécnica de Madrid.