Juan S. Cely G.

Robotics Researcher
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Personal Profile

Robotics researcher with experience in design and construction of research prototypes, both in the mechanical, electrical and software areas, and good communication with his team. He has knowledge in design software and programming of mobile robots, contributing to new perspectives in design or construction. Looking for a new role in competitive teams in industrial areas or cutting-edge robotics research with the aim of being pioneers worldwide in the development and implementation of technology.

Career Summary

2022 Sep. – present **Faculty Member**
Universidad Europea de Madrid

Role outline

Faculty member at Department in Industrial and Aerospace Engineering, with responsibilities in teaching and researching. The main research topics are robotics control, autonomous systems and Non lineal dynamics control.

2017 Mar. – 2022 Sep. **Researcher**
Universidad Politécnica de Madrid

Role outline

Researcher at Robotics and Intelligent Machines research group, where it were carried out design, built, programming and control of underwater robotics prototypes.

Achievements

- Development of a modular robot with innate response behaviors DPI2014-57220-C2-1P
- Design, construction and control of equipment for modular underwater robots S2018 / NM7-4331 RoboCity 2030-III-CM
- UNDERWATER HYBRID LEGGED ROBOT FOR RESEARCH ON KINEMATICS, DYNAMICS AND CONTROL DURING THE LOCOMOTION ON THE SEABED – LEGSUB PGC2018-095939-B-I00

Responsibilities

- Design and implementation of an architecture for communication between robotic modular units through the internet.
- Construction of a quadrotor drone-shaped robot for underwater tasks. Identification of hydrodynamic parameters through experimental procedures.
- Depth and stabilization controllers of a quadrotor drone-shaped robot for teleoperation and grasping tasks in underwater environments

2021 Jun. – 2021 Nov. **Researcher**
Instituto de Ciencias Matemáticas – ICMAT

Role outline

Simulations and reporting about the control geometry proposed to carry on loads using elastic cables by quadrotors.

2015 Aug. – 2016 Jan. **Research Assistant**
Universidad Militar Nueva Granada

Role outline

Study of Human Integration through sensor integration (Force – EMG – Artificial Vision – Brain Interface Computer)

Responsibilities

- Implementation of the sensorial integration necessary for a gait test and its visualization.
- To design a graphical user interface for visualization about data caught by sensors into the prototype.
- To elaborate technical reports and documentation about the prototype proposed.

Education

2017 – 2022	**Ph.D. in Robotics and Automation** (UPM)	Cum Laude
2016 – 2017	**M.Sc. in Robotics and Automation** (UPM)	
2008 – 2015	**B.Eng. Mechatronics Engineering** (UMNG)	Meritorious Grade Work

Press Articles

- **What if robots will be the solution to the accumulation of garbage in the oceans?**
  Original title: ¿Y si los robots fueran la solución a la acumulación de basura de los océanos? Autodesk Spain.
  Online: `https://www.autodeskjournal.com/y-si-los-robots-fueran-la-solucion-a-la-acumulacion-de-basura-de-los-oceanos/`

Additional Courses and Interest

2018 2nd – 19th July	**Coursework in Quantum Computing** (UPM)	Madrid, Spain
2014 Feb. – Jun.	**Coursework in Free Software for Enterprise** (UDFJC)	Bogotá, Colombia.

Refereed Journal/Magazine Articles

|1| J. S. Cely, R. Saltaren, G. Portilla, O. Yakrangi, y A. Rodriguez-Barroso, «Experimental and Computational Methodology for the Determination of Hydrodynamic Coefficients Based on Free Decay Test: Application to Conception and Control of Underwater Robots», Sensors, vol. 19, n.o 17, p. 3631, ene. 2019, doi: 10.3390/s19173631.

|2| J. S. Cely, M. Á. Pérez Bayas, M. Carpio, C. E. García Cena, A. Sintov, y R. Saltaren, «Control Strategy of an Underactuated Underwater Drone-Shape Robot for Grasping Tasks», Sensors, vol. 22, n.o 22, Art. n.o 22, ene. 2022, doi: 10.3390/s22228828.

|3| M. Á. Pérez Bayas, J. Cely, A. Sintov, C. E. García Cena, y R. Saltaren, «Method to Develop Legs for Underwater Robots: From Multibody Dynamics with Experimental Data to Mechatronic Implementation», Sensors, vol. 22, n.o 21, Art. n.o 21, ene. 2022, doi: 10.3390/s22218462.

|4| M. Carpio et al., «A Simulation Study of a Planar Cable-Driven Parallel Robot to Transport Supplies for Patients with Contagious Diseases in Health Care Centers», Robotics, vol. 10, n.o 4, Art. n.o 4, dic. 2021, doi: 10.3390/robotics10040111.

|5| G. Portilla, R. Saltarén, A. R. Barroso, J. Cely, y O. Yakrangi, «A Sensor Based on a Spherical Parallel Mechanism for the Measurement of Fluid Velocity: Experimental Development», IEEE Access, vol. 7, pp. 16145-16154, 2019, doi: 10.1109/ACCESS.2019.2892819.

|6| G. Portilla, R. Saltarén, F. Montero de Espinosa, A. R. Barroso, J. Cely, y O. Yakrangi, «Dynamic Walking of a Legged Robot in Underwater Environments», Sensors, vol. 19, n.o 16, p. 3588, ene. 2019, doi: 10.3390/s19163588.

|7| A. Rodriguez-Barroso, R. Saltaren, G. A. Portilla, J. S. Cely, y O. Yakrangi, «Potential Energy Distribution of Redundant Cable-Driven Robot Applied to Compliant Grippers: Method and Computational Analysis», Sensors, vol. 19, n.o 15, p. 3403, ene. 2019, doi: 10.3390/s19153403.

|8| A. Rodriguez-Barroso, R. Saltaren, G. A. Portilla, J. S. Cely, y M. Carpio, «Cable-Driven Parallel Robot with Reconfigurable End Effector Controlled with a Compliant Actuator», Sensors, vol. 18, n.o 9, p. 2765, sep. 2018, doi: 10.3390/s18092765.

|9| R. Saltarén, G. Portilla, A. R. Barroso, y J. Cely, «A Sensor Based on a Spherical Parallel Mechanism for the Measurement of Fluid Velocity: Physical Modelling and Computational Analysis», Sensors, vol. 18, n.o 9, p. 2867, sep. 2018, doi: 10.3390/s18092867.

|10| O. Yakrangi et al., «An Intelligent Algorithm for Decision Making System and Control of the GEMMA Guide Paradigm Using the Fuzzy Petri Nets Approach», Electronics, vol. 10, n.o 4, Art. n.o 4, ene. 2021, doi: 10.3390/electronics10040489.

Refereed Conference Articles

|1| M. A. Carpio-Alemán et al., «Collision and Tension Analysis of Cable-Driven Parallel Robot for Positioning and Orientation», en 2018 IEEE International Autumn Meeting on Power, Electronics and Computing (ROPEC), nov. 2018, pp. 1-6. doi: 10.1109/ROPEC.2018.8661464.

|2| A. R. Barroso, R. Saltaren, G. Portilla, J. S. Cely, y M. Carpio, «Smooth Path Planner for Dynamic Simulators Based on Cable-Driven Parallel Robots», en 2018 International Conference on Smart Systems and Technologies (SST), oct. 2018, pp. 145-150. doi: 10.1109/SST.2018.8564635.

|3| J. S. Cely G. y O. Rubiano, «Identificación, modelado y control de un motor DC sensado con un tacogenerador», presentado en Second International Conference on Advanced Mechatronics, Design, and Manufacturing Technology - AMDM 2014, 2014, pp. 289-294.

|4| O. Rubiano, R. Castillo, C. Hurtado, y J. Cely, «Estrategia para la auto reconfiguración para el sistema robótico modular - MECABOT», presentado en Second International Conference on Advanced Mechatronics, Design, and Manufacturing Technology - AMDM 2014, 2014, pp. 109-114.

Patents

|1| P. R. J. Saltaren, C. C. E. Garcia, S. C. G. Juan, y F. J. M. Angosto, «Sistema de generación y transmisión de potencia mecánica para accionamiento de actuadores hidráulicos remotos», ES2884499A1, 10 de diciembre de 2021 Accedido: 13 de mayo de 2022. [En línea]. Disponible en: `https://patents.google.com/patent/ES2884499A1/en?inventor=Sebasti%C3%A1n+Cely+Guti%C3%A9rrez+Juan`

|2| P. R. J. Saltaren, G. J. S. Cely, B. A. Rodriguez, T. G. A. Portilla, y O. Yakrangi, «Sistema subacuatico para labores de acuicultura», ES2729816B2, 25 de junio de 2021 Accedido: 13 de mayo de 2022. [En línea]. Disponible en: https://patents.google.com/patent/ES2729816B2/en?q=gutierrez&inventor=cely&oq=inventor:+cely+gutierrez