Manuel Napoleón Cardona Gutiérrez

Education

2017–2020 **PhD in Automation and Robotics**, *Universidad Politécnica de Madrid*, Madrid, Spain.

2012 **Postgraduate in Scientific Research**, *Universidad Evangélica de El Salvador*, San Salvador, El Salvador.

2009 **Postgraduate in Innovation Management**, *Leipzig University - ISEADE, FEPADE*, San Salvador, El Salvador.

2007 – 2008 **Master in Automation and Robotics**, *Universidad Politécnica de Madrid*, Madrid, España.

1998 – 2004 **Electrical Engineer**, *Universidad de Sonsonate*, Sonsonate, El Salvador.

Other Courses Attended

2011 **Robotics Research**, *Universidad Politécnica de Madrid*, Madrid, Spain..

2011 **Best Practices in Management of Higher Education Institutions**, *Universidad Centroamericana "José Simeón Cañas"*, San Salvador, El Salvador..

2008 **EUROHAPTICS**, *Universidad Politécnica de Madrid*, Madrid, Spain.

2004–2007 **Certificate of proficiency in English, CPE**, *Centro Cultural Salvadoreño Americano, CCSA*, San Salvador, El Salvador.

Experience

2019–Present **Research Director**, Universidad Don Bosco, San Salvador.

2016–Present **Consultant**, Specialist, Fourth Industrial Revolution, Internet of Things, Digital Transformation, Robotics Systems, Computer Vision, Control Systems, Disruptive Technologies, Electronic Signature, Research and Innovation..

2014–Present **Professor & Researcher**, Universidad Don Bosco, San Salvador.
Research Areas: Robotics, Automation, Control, Computer Vision and Artificial Intelligence.
Courses: Robotics, Digital Control, Mobile Robots, Flexible Manufacturing Systems, Production Lines, Industrial Instrumentation, MATLAB, Computer Vision.

2014–Present **Master Courses Professor**, Universidad Don Bosco University, San Salvador.
Courses: Application of Robotics in Manufacturing, Vision Systems in Manufacturing, Research Seminar.

2008–2014 **Professor & Research**, Universidad de Sonsonate, Sonsonate.
Courses: Digital Systems, Electronics, Automation Control, Microcontrollers, Estatics, Dinamycs

2004 **Summer Intern**, AES CLESA & CIA, Sonsonate.
Power Meter Programmer, Measurement Systems Installation in Subestations

Awards

2020 PhD Cum Laude.

2016 Doctorate Degree Scholarship.

2015 IEEE Senior Member Elevation.

2008 Highest Grade on Master Thesis – MSc (Hons), Laudatur.

2007 Master Degree Scholarship.

2004 Highest Grade Bachelor Degree–BEE (Hons).

Languages

Self-assessment European Level CEFR (C2 maximum evaluation)

		Understanding		**Speaking**		**Writing**
		Listening	Reading	Interaction	Production	
Spanish	Mother Tongue	*C2*	*C2*	*C2*	*C2*	*C2*
English	Advance	*C1*	*C2*	*C1*	*C1*	*C1*

Professional Service & Affiliations

- IEEE Member 2009-Present, *Senior Member*
- IEEE Chair, El Salvador Section, 2022 - 2023
- Awards and Nomination Chair IEEE, El Salvador Section, 2017 - 2019
- Technical Activities Chair IEEE, El Salvador Section, 2016 - 2017
- Education Chapter Chair IEEE, El Salvador Section, 2016 - present
- Member of the IEEE Societies:
  - Aerospace and Electronics Systems (AESS)
  - Robotics and Automation (RAS)
  - Education(EdSoc)
  - Engineering in Medicine and Biology (EMB)
  - Electron Devices (EDS)

- Women in Engineering (WIE)
- Young Professionals (YP)
- Special Interest Group on Humanitarian Technology (SIGHT)

- IEEE, Industry Applications (IAS), *Chapter Chair, El Salvador Section, 2012-2013*
- IEEE, Student Branch Counselor, *Universidad de Sonsonate, 2010 - 2016*
- IEEE, Student Branch Mentor, *Universidad Don Bosco, 2020 - present*
- IEEE RAS, Student Branch Counselor Advisor, *Universidad Don Bosco, 2014 - present*
- IEEE AESS, Student Branch Counselor Advisor, *Universidad Don Bosco, 2017 - present*

Publications

2022 J. Ordonez, M. Cardona, D. Aguilar, M. Ordonez, C. L. Garzón. A Novel Monitoring System for Contagious Diseases of Patients using a Parallel Planar Robot. *2022 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT)* DOI: 10.1109/ICMLANT56191.2022.9996485

2022 M. Perdomo, M. Cardona, D. Castro, W. MejÃa. Literature Review on Artificial Intelligence Implementation in the Honduran Agricultural Sector. *2022 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT)* DOI: 10.1109/ICMLANT56191.2022.9996484

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2022 M. Cardona, F. Serrano. A Systematic Review of Control Strategies for Solar Tracking Systems. *2022 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT)* DOI: 10.1109/ICMLANT56191.2022.9996504

2022 M. Cardona, J. Ordonez, I. Magomedouva. The Effect of Adding a One Degree of Freedom to a Robotic Manipulator. *2022 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT)* DOI: 10.1109/ICMLANT56191.2022.9996535

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2022 C. Villatoro, J. Ordonez, M. Cardona. Design of a Unmanned Surface Robot for Lakes Monitoring *2022 IEEE 40th Central America and Panama Convention (CONCAPAN).* DOI: 10.1109/CONCAPAN48024.2022.9997761

2022 M. Cardona, J. Cerrato, E. García. Mobile Robots for COVID-19 Pandemic: A State of the Art *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959722

2022 A. Rodríguez, K. Cornejo, R. Mejía, M. Cardona. Chatbots Analysis for the Creation of Automated Conversations in Real Time. *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959611

2022 W. Rivas, M. Cardona. Adaptive Robust Control Design for a Lower Limb Exoskeleton Robot *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959259

2022 J. Ordoñez, M. Perdomo, M. Cardona, C. Estevez, F. Bonilla, L. Pineda, A. Carrasco. Study Case: Fabrication of a Low-Cost Robotic Mobile Platform for Logistic Purposes *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959686

2022 M. Cardona, J. Cerrato, E. García. Design and Simulation of a Mobile Robot for Pipeline Inspection *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959592

2022 J. Alvarado, F. Ramos, J. Rosales, M. Cardona, C. Garzón. Digitization of electrical energy reading for residential users using IoT technology *2022 IEEE Central America and Panama Student Conference (CONESCAPAN).* DOI: 10.1109/CONESCAPAN56456.2022.9959629

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2021 J. Avila, M. Ordoñez, D. Aguilar, M. Cardona. Propose Method for the Design of a Transtibial Prosthesis using Generative CAD/FEM Analysis and Additive Manufacturing *2021 IEEE International Conference on Machine Learning and Applied Network Technologies (ICMLANT).* DOI: 10.1109/ICMLANT53170.2021.9690535

2021 M. Cardona. Exoskeleton Robot for Rehabilitation ALICE: Jacobian and Workspace Analysis *2021 IEEE Fifth Ecuador Technical Chapters Meeting (ETCM).* DOI: 10.1109/ETCM53643.2021.9590800

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2021 Cardona, M., Serrano, F., Martín, J.A., Rausell, E., Saltarén, R., García-Cena, C.E. 2020. El Exoesqueleto de Rehabilitación de la Marcha ALICE: Análisis Dinámico y Evaluación del Sistema de Control Utilizando Cuaternios de Hamilton. *Revista Iberoamericana de Automática e Informática industrial, [S.l.], v. 18, n. 1, p. 48-57, dic. 2020. ISSN 1697-7920.* DOI: https://doi.org/10.4995/riai.2020.12558

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2019 S. Gutiérrez, L. Islas, F. Martín, M. Cardona, et al. Wireless Ammeter Based on ZigBee for Continuous Monitoring of Induction Motors., *2019 IEEE 39th Central America and Panama Convention (CONCAPAN XXXIX), ISBN 978-1-7281-0883-4.* DOI: 10.1109/CONCAPANXXXIX47272.2019.8977048

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2019 S. Gutiérrez, G. Contreras, H. Ponce, M. Cardona, et al. Development of Hen Eggs Smart Incubator for Hatching System Based on Internet of Things., *2019 IEEE 39th Central America and Panama Convention (CONCAPAN XXXIX), ISBN 978-1-7281-0883-4.* DOI: 10.1109/CONCAPANXXXIX47272.2019.8976987

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2019 M. Cardona and C. García. Biomechanical Analysis of the Lower Limb: A Full-Body Musculoskeletal Model for Muscle-Driven Simulation, *IEEE ACCESS, DOI 10.1109/ACCESS.2019.2927515.*

2018 M. Destarac, J. García, M. Cardona, et al. ORTE Exoskeleton: Kinematic Analysis and Dynamic Modeling, *2018 IEEE 38th Central America and Panama Convention (CONCAPAN XXXVIII), ISBN 978-1-5386-6122-2.* DOI: 10.1109/CONCAPAN.2018.8596581

2018 S. Gutiérrez, E. Barrientos, J. Alvarez, M. Cardona. An Integrated Architecture for Monitoring and Control the Temperature of Different Platforms Based on Internet of Things, *2018 IEEE 38th Central America and Panama Convention (CONCAPAN XXXVIII), ISBN 978-1-5386-6122-2.* DOI: 10.1109/CONCAPAN.2018.8596403

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2018 M. Cartagena, C. Bonilla, J. Menéndez, M. Cardona. Design and Development of a Modular Robotic Kit **CubeBot** for Educational Purposes, *2018 International Conference on Research in Intelligent and Computing in Engineering (RICE), ISBN 978-1-5386-2599-6.* DOI: 10.1109/RICE.2018.8509071

2018 F. Serrano, B. Rodríguez, M. Cardona. Obtención de un Modelo Dinámico para un Robot 3RRR Basado en Teoría de Screws, *Revista Iberoamericana de Automática e Informática Industrial, mar. 2018. ISSN 1697-7920.* DOI: 10.4995/riai.2018.8725

2017 R. Espinoza, M. Destarac, M. Cardona, J. Montaño, et. al. ORTE Exoskeleton: Actuation System Dimensioning and Selection, *Proc. of IEEE 37th Edition of the Central America and Panama Convention (CONCAPAN XXXVII), Managua, Nicaragua.* DOI: 10.1109/CONCAPAN.2017.8278493

2017 M. Cardona, M. Destarac, C. García. Exoskeleton Robots for Rehabilitation: State of the Art and Future Trends, *Proc. of IEEE 37th Edition of the Central America and Panama Convention (CONCAPAN XXXVII), Managua, Nicaragua.* DOI: 10.1109/CONCAPAN.2017.8278480

2017 M. Cardona. State and Future Trends of Industrial Robots in Latin America, *Reportero Industrial, Vol. 85, Ed. 4. pp. 12-15, 2017.*

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2016 M. Cardona. Sugar Crystals Characterization for Quality Control Inspection Using Digital Image Processing, *Proc. of IEEE 36th Edition of the Central America and Panama Convention, Heredia, Costa Rica.* DOI: 10.1109/CONCAPAN.2016.7942378

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2015 I. López, R. Argueta, G. López, J. Gálvez, M. Cardona. Software Development for Features Extraction of Sugar Crystals using Artificial Vision, *2015 CHILEAN Conference on Electrical, Electronics Engineering, Information and Communication Technologies (CHILECON)*, pp. 835-840. DOI: 10.1109/Chilecon.2015.7404669

2015 R. Argueta, G. Lpez, J. Gálvez, I. López, M. Cardona. Statistical Analysis for Quality Control of Sugar using Machine Vision, *IEEE, CONESCAPAN XXXIV, El Salvador.*

2015 M. Cardona. Dimensional Synthesis of 3RRR Planar Paralell Robots for Well-Conditioned Workspace, *IEEE Latin America Transactions.* DOI: 10.1109/TLA.2015.7055557

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Books

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2020 Kumar, R., Quang, N.H., Kumar Solanki, V., Cardona, M., Pattnaik, P.K. *Research in Intelligent and Computing in Engineering. Select Proceedings of RICE 2020*, Springer International Publishing, 2020. ISBN 978-981-15-7527-3

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2017 I. Chang, J. Baca, H. Moreno, I. Carrera and M. Cardona, *Advances in Automation and Robotics Research in Latin America*, Springer International Publishing, 2017, ISBN 978-3-319-54376-5. DOI 10.1007/978-3-319-54377-2

Research Editorial Work

Reviewer

2019–Present SAGE PUBLICATIONS INC, International Journal of Advanced Robotic Systems. *ISSN: 1729-8814. Q4*

2019–Present IGI Global, International Journal of Smart Sensor Technologies and Applications (IJSSTA). *ISSN: 2644-1845*

2019–Present IGI Global, International Journal of Hyperconnectivity and the Internet of Things (IJHIoT). *ISSN: 2473-4365*

2019–Present IEEE Sensors Journal. *ISSN: 1530-437X. Q1*

2018–Present Springer, Neural Computing and Applications, *ISSN: 0941-0643. Q1*

2018–Present Taylor and Francis, Book Proposals

2016–Present IEEE Journal, IEEE Latin America Transactions, *ISSN: 1548-0992.*

Associate Editor

2017–Present International Journal of Machine Learning and Networked Collaborative Engineering (IJMLNCE), *ISSN 2581-3242.*

Editor in Chief

2022 Guest Editor, Micromachines MDPI, Special Issue "MEMS Microgrippers and Their Applications", , *(ISSN 2072-666X, IF:2.891, JCR Q2*

2021 IEEE II International Conference on Machine learning and Applied Network Technologies (ICMLANT 2021), *ISBN:978-1-6654-4951-9, DOI: 10.1109/ICMLANT53170.2021*

2020 IEEE I International Conference on Machine learning and Applied Network Technologies (ICMLANT 2020), *ISBN:978-1-7281-8886-7, DOI:10.1109/ICMLANT50963.2020*

2018 IEEE International Conference on Research in Intelligent and Computing in Engineering (RICE 2018), *ISBN 978-1-5386-2599-6.*

2018 IEEE 38th Central America and Panama Convention (CONCAPAN XXXVIII)., *ISBN 978-1-5386-6122-2.*

Congress

Program Chair IEEE International Conference on Research in Intelligent and Computing in Engineering (RICE 2020), *ISBN 978-1-5386-2599-6.*, Vietnam

Steering Program Committee	International Conference on Research in Intelligent and Computing in Engineering (RICE 2019), Springer, *ISBN 978-9811527791. Vietnam*
Technical Committee	International Conference on Innovative Computing and Communication (ICICC-2019), Springer. *ISBN 978-9811512858, Czech Republic*
General Chair	IEEE International Conference on Research in Intelligent and Computing in Engineering (RICE 2018), *ISBN 978-1-5386-2599-6.*
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