

CURRICULUM VITAE CARMEN MULLER-KARGER

I. EDUCATION

PhD	Central University of Venezuela	Dr. in Science, Biomechanical Engineering	1998-2001
MSc	University of Virginia, VA, U.S.A.	Mechanical Engineering. Rotodynamics	1992-1994
BSc	Simón Bolívar University (USB). Venezuela.	Mechanical Engineering.	1985-1990

II. ACADEMIC AND WORK EXPERIENCE

Florida International Univ., Associate Teaching Prof., Mechanical Eng. Dpt.	Aug. 2023–present
Florida International Univ., Undergraduate Co-Director, Mech. Eng. Program	Aug. 2022–Aug. 2024
Florida International Univ., Assistant Teaching Prof., Mechanical Eng. Dpt.	Aug. 2020–Aug. 2023
Coordinator of the courses Statics and Dynamics	Aug. 2019 – present
Florida International Univ., Instructor, Mechanical Eng. Dpt.	Sep. 2017 -Aug. 2020
Florida International Univ., Professional Advisor, Mechanical Eng. Dpt.	Jul. 2016 - Sep. 2017
Simon Bolivar University, Assistant, Associate to Full Professor	Jan. 1991 - Dic.2015
Simon Bolivar University, Coordinator Mech. Eng. Graduate Studies	Sep. 2011 - Sep.2014
Rancho Los Amigos National Rehabilitation Center, Downey, CA, and Dept. of Kinesiology at USC. Invited Scholar as Research Engineer	Sep. 2010 - Aug. 2011
Simon Bolivar University, Director of Motion Analysis Laboratory	Nov. 2007-Sep. 2015
Simon Bolivar University, Advisor Coordinator for Social Work	Nov. 2007-Sep. 2010
Simon Bolivar University, Founder, Director Biomechanical Research Group	Oct. 2004- Dic.2015
Technische Universität München, Munich, Germany, Invited researcher	Sep.-Dic.1999&2000

III. TEACHING EXPERIENCE

At Florida International University (2016-2020)	Terms
EMA 3702 Mechanics of Materials (online)	Fall 2024
EML 1533 Intro to CAD (course for Dual Enrollment Program)	Since Fall 2021 (10 times)
EML 4220 Mechanical Vibration (online, QM certified)	Since Fall 2021 (13 times)
EGN 3321 Dynamics (online, in person, remote, QM certified)	Since Fall 2018 (14 times)
EGN 3311 Statics (remote, in person, hybrid)	Since Summer 2018 (16 times)
EGN 3503 Applied Mechanics (in person)	Since Summer 2017 (2 times)
EMA 3702 Mech and Materials Lab (in person)	Summer 2018
EML 4905 Senior Project Design (in person)	Spring 2018, Spring 2021
EML 4551 Senior Project Organization (in person)	Fall 2017 to Fall 2019
EGN 1006 Intro to Engineering (in person)	Spring 2016, Spring 2019

Courses taught at Simon Bolivar University, Caracas, Venezuela (1991 to 2015)

MC 1214 Mechanics,	MC 2142 Solid Mechanics,
MC 2141 Mechanics of Materials,	MC 2431 Dynamics,
MC 2411 Mechanics I,	MC 2421 Computational Mechanics,
MC 2412 Mechanics II,	MC 5519 Fundamentals of Biomechanics,
MC 2413 Mechanics III,	MC 7481 Biomechanics.
MC 2415 Mech. Vibration	MC7167 Lubrication and hydrodynamics Bearings

IV. HONORS AND ACADEMIC AWARDS

- Award “Excellence in Teaching”, awarded by Mechanical Eng. Dpt. FIU (2023)
- Award “Excellence in Teaching”, awarded by Center of Advance Teaching, FIU (2022)
- Award “Excellence in collegiality”, awarded by Mechanical Eng. Dpt. FIU (2021)
- Award “Outstanding Academic Work 2007-2008” awarded by USB. (2009)
- Award “Fernando Fernandez”, Excellence in Extension 2006-2009, awarded by USB (2006)
- Award “Antonio Jose de Sucre”, Excellence in Education 2003-2005, awarded by USB Professor’s Association. (2008)
- Mention of Honor to the Doctoral Thesis (2002)
- Award for Excellence in Education. PDVSA: "Best Lecture performance 1996-1997". (1998)
- Award “Outstanding Academic Work” , USB, 1995-1996 (1997)
- CUM LAUDE, B.Sc Diploma Mechanical Engineer. (1991)
- Scholarship for Academic Merit granted by LAGOVEN S.A. (1990)

V. PROFESSIONAL DEVELOPMENT IN TEACHING

- Inquiry Institute II – Center of Advance Teaching (CAT) Workshop Summer 2023
- Amplify Institute, 25 hours of faculty development in efforts towards amplifying education leadership in Hispanic Serving Institutions Fall 2022
- American Society for Engineering Education ASEE Conference 2022 Jun 26-29, 2022
- Inquiry Institute I – Center of Advance Teaching (CAT) Workshop Spring 2022
- Workshop Hybrid course design FIU – CAT Workshop Fall 2021
- Teaching with LAs: Designing Group-worthy Activities - CAT Workshop Fall 2021
- Attendance to Teaching Professor Conference (Online event) Jun 2021
- QS Reimagine Education Awards & Virtual Conference, acquiring comparative insight and knowledge about best pedagogical practices and educational innovation Dec 2-11, 2020
- Academic Assessment Certificate (Badge) Spring 2020
- Remote Teach Ready (Badge) Spring 2020
- Lunch and learn Online (7 sessions) Fall 2019 /2020
- American Society for Engineering Education ASEE Conference 2020 Jun 24-27, 2020
- Learning Assistant (LA) Research Symposium and/or International LA Conference, Boulder Colorado, University of Colorado Boulder, CO Oct.19-21, 2019
- American Society for Engineering Education ASEE Conference 2019, Tampa Jun 16-19, 2019

VI. MENTORING

Mentor for Student Organization at FIU: SHPE, Society of Hispanic Professional Engineers, Fall 2023 – to present

Advisor for Senior Design Project at FIU: 2 teams (spring 2019), 3 teams (fall 2019), 2 teams (spring 2020), 2 teams (2021)

Mentor for Senior Design Project Organization at FIU: 30 teams (fall 2018), 31 teams (fall 2017)

Mentor for Student Organization at FIU: Entertainment Engineering Group (EEG) Fall 2019 – to Fall 2022

Undergraduate Research FIU: Victor Morales (summer 2019)

Undergraduate Special Topic, Animation using Solidworks: Anna Cerqueira, Adrianna Cerqueira, Diego Dubois, Noris Echeverria (Fall 2021)

Advisor for Doctoral Dissertations at Simon Bolivar University (3): Belkys Amador (2014), Marco Ciaccia (2014) , Thalia San Antonio (2012).

Advisor of Master of Science Thesis at Simon Bolivar University (10): Adriana Lammardo (2012), Nelson Santoni (2010), Ruben Figueroa(2009), Nino Gómez (2008), Lilibeth Zambrano (2008), Juan Carlos Gonzalez (2004) Carlos Alfonzo Larrazabal (2004), Thalia San Antonio (2001), Gregoria Nuñez (2000), Antonio Perillo –Marcone (1997)

Advisor for Mechanical Engineer Research Work at Simon Bolivar University (22): Jesus Campo (2015), Gabril Díaz (2015), Marco Pompa (2014), Kathiuska Gil (2014), Carmen Quevedo (2013), Celeste Miquelena (2013), María Angélica Campello (2013), Daniel Vecchio (2010), Alexander Escobar (2010), Romero, Jorge (2010), Suniaga, Salvador (2009), Alejandra Muñoz Arocha (2008), David Vargas (2008), Picón, Vanessa (2008), Nelson Santoni (2007), Albert Fuentes (2007), Ricardo Fernández y Ernesto Antón (2006), U. Lanza (2006), Maria Elena Montero (2004), Rafael Cartusciello (2004), Carrillo, Daniel (2004), Roosvelt Rodríguez (2001), Carlo Javier Marquez (2001).

VII. WORKS IN PROGRESS NOT FUNDED

Project: Teaching core engineering courses, Statics and Dynamics, considering different types of learners. The project was shortlisted for QS Reimagine Education Awards 2021 and accepted and presented for publication at ASEE conference 2022.

Project: Applying best teaching practices in the design and development process of virtual content for statics and dynamics engineering courses. Submitted to QS Reimagine Education Awards 2020. The project was classified as high-scoring non-shortlisted applicants.

VIII. RESEACH PROJECTS

- Development of a Mechanical polycentric knee prosthesis, from conceptual design, detailed design, to assessment. (2010-2016)
- Biomechanics of the shoulder joint during multiplane tasks (propulsion and transfer) by manual wheelchair users. (2010-2013)
- Bone tissue Simulation-Orientation of orthotropic material properties in a femur FEA. (2009-2012)
- Design and performance of plastic modular adaptors for external transtibial prostheses. (2010)
- Creating a gait analysis lab. in Venezuela: a combination of local and international efforts.<https://isbweb.org/component/content/article/127-edc-projects/276-usb-venezuela> (2007-2010)
- Aiming technology in developing countries to obtain high quality prostheses at low cost. (2007-2016)
- Using FEA for Dynamic Energy Return Analysis of Prosthetic Feet during Design Process. (2009-2011)
- Stress analysis of bone structure for medical devises designs”. Funded by: FONACIT USB2005000172. 167.129.444,80. (2007-2010)

- "Biomechanical study of intervertebral disk, simulation using Finite element Method". Funded by Dean of Research, Simon Bolivar University. (2008-2010)
- P version of the finite element method for highly heterogeneous simulation of human bone. (2001- 2004)

IX. BOOKS EDITED AND BOOK CHAPTERS

1. Müller-Karger, C.M. Torrealba, Rafael, Amador, Belkys; Orlando Pelliccionni and Maria Virginia Candal ; **“Innovación tecnológica nacional en dispositivos protésicos y ortésicos: Metodología de diseño para aplicaciones en miembros inferiores”**, Book Chapter pp. 106-130. Diseño de dispositivos para rehabilitación y ortesis. M. Vergara, M.Díaz, F Rivas y M. Restrepo. 2017.
2. Amador, Belkys; Torrealba, Rafael; Müller-Karger, C.M. **"Development of mechanical polycentric knee prosthesis: introducing a methodological approach"**. Book Chapter pp. 1 - 45. "New developments in knee prosthesis research". Editores: Janice Stewart . NOVA Science Publishers. New York, USA. 2015. ISBN: 978-1-63482-700-3.
3. Müller-Karger, C.M; Wong, S; La Cruz, A. (2008) IFMBE Proceedings, Vol 18, **Proceedings of “IV CLAIB”**. Springer-Verlag. Heidelberg, Germany. 2007. ISBN: 978-3-540-74470-2.
4. Müller-Karger, C.M, M. Cerrolaza, (2003), **“Bioengineering in Iberoamerica: Avances and Developments”**, (CIMNE), Printed by: Zaboram, Pamplona 96-104, Barcelona, España, ISBN:84-95999-42-0
5. Müller-Karger, C.M, Lentini M., Cerrolaza M., (2002), **“Recent Developments In Numerical Methods for Engineering and Applied Sciences,”**, SVMNV. ISBN: 980-00-1951-0, Graficas León SRL, Venezuela.

X. SELECTED PEER-REVIEWED PUBLICATIONS

1. Medina, Luis, Muller-Karger Carmen, Casanova, Euro (2023) The Virtual Rotor Kit Project: A virtual rotor test rig for balancing experiments. **International Journal of Mechanical Engineering Education**, DOI: 10.1177/03064190231197119.
2. Zambrano, L., Lammardo, A. and Muller-Karger, C.M. (2013) Numerical Models for the annulus fibrosus: State of the art. **Rev. Fac. Ing. UCV**, vol.28, no.4, p.117-130. ISSN 0798-4065
3. San Antonio, T.; Ciaccia, M.; Müller-Karger, C.M; Casanova, E. (2012) "Orientation of orthotropic material properties in a femur FE model: A method based on the principal stresses directions". **Medical Engineering & Physics** 34 (2012) 914– 919.
4. Amador, B.; Torrealba, R.; Rojas, M.; Cappelletto, J.; Müller-Karger, C.M. (2012) "Methodology for dimensioning a polycentric knee mechanism using gait data and genetic algorithms. ". **Revista Ingeniería Biomédica**, Colombia. 2012.
5. Torrealba, Rafael; Müller-Karger, C.M. (2010) "Design and performance of plastic modular adaptors for external transtibial prostheses". **Journal of Medical Devices (ASME)**. 4(2), 027510
6. Santoni N, Matos M., Müller-Karger C.M, Nicola H., Sabino M., Müller A. (2008), “Caracterization Caracterización de hidrogeles de quitosano entrecruzados covalentemente con genipita”, **Rev. Iberoam. Polim** 9 (3).

7. Zambrano L., Müller-Karger C.M (2008) "Estudio del Efecto de Placas de Fijación en Fracturas de Tibia Proximal Utilizando el Método de Elementos Finitos". **Boletín Técnico, IMME**. Compendex 46. 43- 60.
8. San Antonio T., Ciaccia M, Müller-Karger C.M, Casanova E. (2008). "Metodología para incorporar Propiedades de Tejido óseo no Isotrópico a un modelo de Elementos Finitos ". **Boletín Técnico IMME**. 46, 29 - 42.
9. Ciaccia M., San Antonio T, Müller-Karger C.M, Casanova E., (2008) "Influencia del modelado de las condiciones de borde en la simulación de ensayos mecánicos de huesos bovinos". **Rev. Fac. Ing.UCV**. Compendex 23(2).
10. Müller-Karger C.M, Rank E., Cerrolaza M., (2004) "P version of the finite element method for highly heterogeneous simulation of human bone", **Finite Elements in Analysis and Design**, 40 (7):757-770.
11. San Antonio T., Müller-Karger C.M (2003), Diseño y modelaje tridimensional paramétrico de prótesis de rodilla, **Revista INGENIERÍA UC**, Compendex. Vol 11, N°1, pp. 14-26.
12. Müller-Karger C.M., Cerrolaza M., (2001) Un nuevo método para la simulación de la estructura ósea mediante la versión p de elementos finitos, **Boletín Técnico del IMME.**, Compendex Index. Vol 39 (1), pp. 23-54.
13. Müller-Karger C.M, González C., Aliabadi, Cerrolaza M. (2000) "Three dimensional BEM and FEM stress analysis of the human tibia under pathological conditions", **Computer Modeling in Eng. & Sciences.**, 2(1), pp1-13.
14. Müller-Karger C.M, Scarpatti J., Rodríguez, Granados A., (1998), "Programa de Simulación Para Manipuladores de 6 Grados de Libertad Tipo Puma", **Boletín Técnico, IMME**, Compendex Index. Vol. 36 (3)1-17.
15. Müller-Karger C.M, Granados A., (1997), "Derivation of Hydrodynamic Bearing Coefficients Using the Minimum Square Method." , **Transactions of ASME, Journal of Tribology**, 119:802-807.
16. Müller-Karger C.M, Barrett L, Flack, (1997), "Influence of Fluid Film Non-Linearity on the Exp. Determination of Dyn. Stiff. and Damping Coef. for three Lobe Journal Bearings." **Tribology Transactions**, 40(1):49-56.

XI. CONFERENCES AND PROCEEDINGS (56 total, most recent listed)

1. Müller-Karger, C.M, Medina L. Enhancing Mechanical Vibration Education through Virtual Labs: A Focus on Rotor Balancing, **Paper presented at 2024 ASEE Annual Conference & Exposition, Portland Oregon.**
2. Müller-Karger, C.M, Teaching core engineering courses, Statics and Dynamics, considering different types of learners. **Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. <https://peer.asee.org/41295>**
3. Müller-Karger, C.M, Steiner L. "Dynamics Online Course: A Challenge content delivered with best teaching practices keeps students engaged". **American Society of Engineering education, ASEE 2020 Conference. Online Conference.**
4. Wagner E, Russell I., Muller-Karger C.M., Requejo P. S., Rodgers M.M, Flashner, and. McNitt-Gray J.L, "An approach for characterizing complex multiplanar upper extremity motion through parsed angular velocity vector components", **40st Annual Meeting of the American Society of Biomechanics (ASB)** Raleigh NC, 2016.

5. Wagner E, Brown K., Muller-Karger C.M, Flashner H, and McNitt-Gray J.L “Dual-Quaternion Analysis of Shoulder and Upper-Extremity Motion for Calculation of Angular Velocity Joint Axis” **World Congress of Biomechanics**, Boston USA, July 6-11 2014.
6. Müller-Karger, C.M; Wagner E.; Maneekomkunwong Somsoon; Brown K.; Flashner H.; Russel I.; Requejo P.; McNitt-Gray J.. "Representation of shoulder kinematics during multiplane tasks performed by manual wheelchair users". Podium. **XXIV Congress of the International Society of Biomechanics** Natal, Brasil. August 2013.
7. Lammardo A.; Müller-Karger, C.M; Zambrano, L. "Sensitivity analysis of the annulus fibrosus fibers inclination in a arametric model of the intervertebral disc". Podium. **XXIV Congress of the International Society of Biomechanics** Natal, Brasil. August 2013.
8. Amador, B.; Müller-Karger, C.M; Casanova, E; Torrealba, R. "Structural analysis during the design of polycentric prosthetic knee". Podium. **24th XXIV Congress of the International Society of Biomechanics** Natal, Brasil. August 2013.
9. Pelliccioni, O.; Candal, M; Bermeo, M.; Müller-Karger, C.M. "Uso de Programa basado en Elementos Finitos de Moldeo por Inyección de Plástico para el Análisis Comparativo de Materiales durante el Diseño de Prótesis de Pie". Podium. **VIII Panamerican Health Care Exchanges Conference (PAHCE 2013)**. Medellin, Colombia . May 2013.
10. Amador, Belkys; Müller-Karger, C.M; Torrealba, Rafael; Vidal, Antonio. "Comparación de las condiciones de contacto en el análisis estructural de unarnprótesis policéntrica de rodilla". Podium. **Pan American Health Care Exchanges PAHCE 2013**. Medellín, Colombia. April 2013
11. Torrealba, Rafael; Amador, Belkys; Müller-Karger, C.M. "Aiming technology in developing countries to obtain high quality prostheses at low cost". Modalidad: Podium. **International Society for Prosthetics and Orthotics ISPO 2013 World Congress**. Hyderabad, India. February 2013.
12. Müller-Karger, C.M; Torrealba, Rafael; Steele, Julie; Laurens, Ediuska; Amador, Belkys. "Creating a gait analysis laboratory in Venezuela: a combination of local and international efforts". Podium. **International Society for Prosthetics and Orthotics ISPO 2013 World Congress**. Hyderabad, India. February 2013.
13. Pelliccioni, Orlando; Candal, M; Bermeo, M.; Müller-Karger, C.M. "Uso de Programa basado en Elementos Finitos de Moldeo por Inyección de Plástico para el Análisis Comparativo de Materiales durante el Diseño de Prótesis de Pie". Modalidad: Podium. **Pan American Health Care Exchanges PAHCE 2013..** Medellin, Corea del Norte. May 2013.
14. Requejo P.; Maneekobkonwong Somboon; Müller-Karger, C.M; Ruparel P.; Haubert L.L.; Mulroy S.. "Measurement system to assess the biomechanics of independent car transfer and wheelchair loading" . **RESNA 2012 Annual Conference- Rehabilitation Engineering And Assistive Technology Society of North America**. Baltimore, USA. Jun 2012. CD: "Proceedings". pp. 1 - 5.
15. Müller-Karger, C.M; Santoni Nelson; Matos Mireya; Zambrano, Lilibeth. (2012) "Modelo numérico de unidad vertebral para el análisis de prótesis de núcleo pulposo / Numerical model of vertebral unit for the nucleus pulposus prosthesis analysis ". Oral. **Pan American Health Care Exchanges (PAHCE)**. Miami, USA. Mars 2012.

XII. OTHER ACTIVITIES

Scientific committees and congress organization

- Scientific Committee member “Pan American Health Care Exchanges (PAHCE)” 2012-2023.
- Scientific Committee member “V Annual Engineering Congress ASME USB 2007 and 2008”
- President of the Scientific Committee, and editor of the proceedings IV Congreso Latinoamericano de Bioingeniería, Margarita Venezuela, CLAIB, September 2007.
- Scientific Committee member “VI Congreso Nacional de Ingeniería Mecánica 2006,” VI CONIM 2006.
- Scientific Committee member “II International Conference on Computational Bioengineering, ICCB2005.
- Scientific Committee member “V Annual Engineering Congress ASME USB 2005.” May 2005
- Organization of technical session at the V Annual Engineering Congress ASME USB 2005.
- Organization of the International Conference of Numerical Method and Applied Science (CIMENICS2002) , 19- 12 April 2002, at USB, Caracas Venezuela.
- Organization of technical session at the European Congress on computational Methods in Applied Sciences and Engineering ECCOMAS2000, 10-14 Sept. 2000, Barcelona, España

Invited Talks

- Invited speaker at ONLINE Faculty webinar: Chunk-a Chunk-a Burning love for Knowledge. Best practices to deliver an online course. April 14th , 2020.
- Invited speaker at FIU CON 2019. “Instructional Technology for Single Concept Videos: More relevant than ever” Nov 7, 2019
- Invited Speaker at 2nd Latin American & Caribbean Conference on Theoretical and Applied Mechanics (LACCOTAM 2012).
- Invited Speaker at VII Congreso de Métodos Numéricos en Ingeniería y Ciencias Aplicadas, CIMENICS’2004.

Academic committees at Florida International University

- Curriculum Committee, College on Engineering and Computing, Florida International University, August 2021- August 2022.
- Committee for Teaching Evaluation Project, Florida International University, 2019 – 2021
- Curriculum Committee, Mechanical Engineering Program, Florida International University, 2018 – 2021
- Student Award Committee, Mechanical Engineering Program, Florida International University, 2018 – 2021
- CEC Award Committee, Florida International University, 2020