

CARMEN MÜLLER- KARGER

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Florida International University
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I. STUDIES:

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

II. WORK EXPERIENCE:

Sept 2017 - present Instructor, Mechanical Engineering Department, Florida International University (FIU)
Jul. 2016 – Sept 2017 Professional Academic Advisor for Mechanical Engineering, Florida International University (FIU)
Jan 1991- Dic.2015 Instructor, Assistant, Associate and Full Professor at USB, Caracas Venezuela.
Sep.2011-Sept.2014 Advisor coordinator for Mechanical Engineering Graduate Studies at USB.
Sep.2010- Aug. 2011 Invited Scholar, as Research Engineer at Rehabilitation Engineering Program at Rancho Los Amigos National Rehabilitation Center, Downey, CA, and Dept. of Kinesiology at USC.
Nov. 2007-Sept. 2015 Coordinator of the Motion Analysis Laboratory at USB.
Nov. 2007-Sept. 2010 Advisor coordinator for Industry Internships at USB.
Nov. 2007-Sept. 2010 Advisor coordinator for Social Work at USB.
Oct. 2004- Dic.2015 Founder, Director of the Biomechanical Research Group at USB
Sep.-Dic.1999&2000 Invited Researcher at Technische Universität München (TUM), Munich, Germany

III. RESEARCH PROJECTS

(2010- present) Development of mechanical polycentric knee prosthesis, from conceptual and detailed design, to assessment.
(2010-2013) Biomechanics of the shoulder joint during multiplane tasks (propulsion/ transfers) by manual wheelchair users.
(2009-2012) Bone tissue Simulation- Orientation of orthotropic material properties in a femur Finite Element model.
(2010) Design and performance of plastic modular adaptors for external transtibial prostheses.
(2007-2010) Creating a gait analysis laboratory in Venezuela: a combination of local and international efforts.
(2007-2016) Aiming technology in developing countries to obtain high quality prostheses at low cost.
(2009-2011) Using Finite Element for Dynamic Energy Return Analysis of Prosthetic Feet during Design Process.
(2001- 2004) P version of the finite element method for highly heterogeneous simulation of human bone.

IV. HONORS AND ACADEMIC AWARDS

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

V. PROFESSIONAL INTEREST AND EXPERTISE

Simulation on Mechanical Engineering, Biomechanics, Motion Analysis, Finite Element Modeling, Mechanical Medical Devices Design. High Education Curriculum Design, Academic Leadership, Undergraduate and Graduate Academic Advising. Tutoring, Math.

VI. UNDERGRADUATE AND GRADUATE INSTRUCTION

Jan.2017-Aug 2017 Intro to engineering (Spring 2017), Applied Mechanics (Summer 2017, Spring 2018), Senior Project Organization (Fall 2017). Lecturer undergraduate level at FIU
Sep.2003-Dic.2015 Fundamental of Biomechanics, Biomechanical Modeling. Undergraduate and Graduate level. USB
Sep.1994-Dic.2015 Lubrication and Hydrodynamic Bearings. Lecturer at graduate level. USB

Sep.1991-Dic.2015 Statics, Dynamics, Vibrations and Numerical Methods Lecturer undergraduate level at USB
Sep.1985-Dic.1991 Math tutoring. High school Algebra.

VII. SUPERVISED STUDENTS WHILE AT SIMÓN BOLÍVAR UNIVERSITY. (Amount of Students)

Doctoral Dissertations (3), Master of Science Thesis (10), Mechanical Engineer Research Work (22).

VIII. BOOKS EDITED AND BOOK CHAPTERS

1. I. Müller-Karger, C.M. Torrealba, Rafael, Amador, Belkys; Orlando Pelliccioni 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: Zatoram, 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.

IX. SELECTED PEER-REVIEWED PUBLICATIONS

1. 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
2. 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.
3. 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.
4. Torrealba, Rafael; Müller-Karger, C.M. "Design and performance of plastic modular adaptors for external transtibial prostheses". **Journal of Medical Devices (ASME)** . 4(2), 027510
5. Santoni N, Matos M., Müller-Karger C.M, Nicola H., Sabino M., Müller A. (2008), “ Caracterización Caracterización de hidrogeles de quitosano entrecruzados covalentemente con genipita”, **Rev. Iberoam. Polim** 9 (3).
6. 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.
7. 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.
8. 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).
9. 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.
10. 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.
11. 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.
12. 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.
13. Müller-Karger C.M, Scarpati 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.
14. 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.
15. 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.

X. CONFERENCES AND PROCEEDINGS (54 total, 5 last years listed)

1. 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.
2. 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.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.

XI. CONFERENCES AND PROCEEDINGS IN VENEZUELA (31 not listed)

XII. RESEARCH GRANTS

1. C.M. Müller-Karger, Rafael Torrealba, Lilibeth Zambrano. Conditioning the Facilities of the Laboratory for Motion Analysis and Robotic Applications. April 2008. Funded by the Dean of Extension. Simón Bolívar University.
2. Zambrano, Lilibeth; Müller-Karger, C.M. "Biomechanical study of intervertebral disk, simulation using Finite element Method". Funded by Dean of Research, Simon Bolivar University. May 2008-Jun 2010
3. Müller-Karger, C.M. “Anisotropic Bone simulation”. Funded by Dean of Research, Simon Bolivar University. October 2007 -2008. DID. 15590.
4. Müller-Karger, C.M; Casanova, E; Matos, M.; San Antonio Thalia; Hazem Nicola. (2005). "Stress analysis of bone structure for medical devises designs”. Funded by: FONACIT USB2005000172. 167.129.444,80.

5. U. Lanza, C. Graciano, C.M. Müller-Karger. Mechanical design, analysis and manufacture of an external prosthetic device for lower limb amputees. Funded by the Dean of Extension. Simón Bolívar University. Oct. 2015.
6. R. Fernandez, E. Antón, C.M. Müller-Karger. Design, analysis and contraction of a orthopedic bed for rehabilitation. Funded by the Dean of Extension. Simón Bolívar University. July. 2015.
7. Müller-Karger, M.Di Liscia, R. Ruiz, S. Diaz , L. Medina. Rotodynamic Analysis of turbogenerators SG-951 y SG-952 de ECOPETRL S.A. Funded by ECOPETROL, and FUNINDES.
8. Müller-Karger, C.M; Martínez, C.(2005) "Bone modeling as a platform for medical devises assesses". Funded by Dean of Research, Simon Bolivar University. April 2005- 2007.

XIII. OTHER ACTIVITIES

1. Scientific Committee member "Pan American Health Care Exchanges (PAHCE)" 2012-2018.
2. Commission for the creation of the Biomedical Engineering Program at USB
3. Invited Speaker at 2nd Latin American & Caribbean Conference on Theoretical and Applied Mechanics (LACCOTAM 2012)
4. 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.
5. Scientific Committee member "VI Congreso Nacional de Ingeniería Mecánica 2006," VI CONIM 2006.
6. Scientific Committee member "II International Conference on Computational Bioengineering, ICCB2005.
7. Scientific Committee member "V Anual Engineering Congress ASME USB 2005." May 2005
8. Organization of technical session at the V Anual Engineering Congress ASME USB 2005.
9. Invited Speaker at VII Congreso de Métodos Numéricos en Ingeniería y Ciencias Aplicadas, CIMENICS'2004,
10. Foundation of the Biomechanical Group at USB, 2004. www.mc.biomecanica.usb.ve
11. Organization of the International Conference of Numerical Method and Applied Science (CIMENICS2002) , 1 9- 12 April 2002, at USB, Caracas Venezuela.
12. Organization of technical session at the European Congress on computational Methods in Applied Sciences and Engineering ECCOMAS2000, 10-14 Sept. 2000, Barcelona, España

Carmen María Müller-Karger
Jun 2017