Manuel Julio García, PhD

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Education

University of Sydney. Sydney, Australia PhD. Aeronautical Engineering, 1999.

University of Los Andes. Bogota, Colombia. M.Sc. Mechanical Engineering, 1993.

University of Los Andes. Bogota, Colombia. B.Sc. (5 years) Mechanical Engineering. 1990.

Professional Activities

August 2015–July 2018 – Senior Lecturer

University of Texas at San Antonio TX, Department of Mechanical Engineering *Instructor* in: Mechanics of fluids, engineering analysis, heat transfer, applied mathematics, mechanical engineering laboratory, thermal system design,

August 2015–August 2016: Visiting professor

University of Texas at San Antonio TX, Department of Mechanical Engineering

November 2004 – October 2005:Visiting professor

University of Alberta, Edmonton, Alberta, Canada. Department of Computing Science. Research at the Advance Man Machine Interface Laboratory (AMMI Lab) in the area of fast solvers for real time simulations.

March 2000 – August 2016: professor

Universidad EAFIT, Medellin, Colombia, Mechanical Engineering Department

Professor, Mechanical Engineering Department. March 2000 – August 2016.

Academic coordinator, Specialization on Computational Mechanics Jan 2012–August 2015
Responsibilities include design of curricula, student counseling, course programming .

Academic coordinator, Master of Science program Jan 2003-Dec 2008
Mechanical Engineering department. Responsibilities include design of curricula, student counseling, course programming .

Instructor March 2000 – August 2016.
In: Mechanics of fluids, Numerical Analysis, Mechanics of solids, Applied Computational Fluid Dynamics, Structural Optimization, Applied Mathematics

Director Applied Mechanics research group. March 2000 – August 2016.
http://mecanica.eafit.edu.co

March 1999 – Feb 2000:Project planning Skina Ltda. Bogotá, Colombia.
Write proposals for industry projects. Design and implementation of methodologies for quality control.

University of Sydney. Sydney Australia

Research Asistant. Jan 1995 – Dec 1999.
Finite Element Research Centre. Researcher in the areas of fast algorithms for Finite Element Analysis, interactive design and structural optimization.

1989 - 1992. Universidad de Los Andes. Bogota Colombia

Director of the VAX computer center Jan 1993 – Dec 1994.
System manager at the School of Engineering. Evaluation of Software and Hardware for the Center for supercomputer applications (MOX).

Lecturer Jan 1993 – Dec 1994.
Departments of Mechanical Engineering, Mathematics and Computer Science. Courses: Mechanical Drawing, Introduction to Mechanical Engineering, Dynamics, Mechanics of Solids, Pre-Calculus, Numerical Analysis, Introduction to programming.

Research Assistant, DFAC Group. 1989 - 1992.
Industrial automation research and development project sponsored by COLCIENCIAS. Researcher in the areas of finite element post-processing and structural optimization.

Honors and Awards

Best Professor Award from the Computational Mechanics postgraduate program at the school of Engineering. EAFIT University. 2013

Best Professor Award from the Computational Mechanics postgraduate program at the school of Engineering. EAFIT University. 2010

EAFIT University Best Research Project Price 2009. "Investigación para el diagnostico técnico de una turbina francis en la minicentral hidroeléctrica la Herradura, bajo una aproximación holística".

Best Professor Award from the Master of Science program at the school of Engineering. EAFIT University. 2008

Best paper award at the III Congreso internacional sobre el Uso Racional y Eficiente de la Energía" CIUREE 2008 for the paper "Simulación Numérica CFD de Turbinas Francis" .

Outstanding Paper at the Emerald Literati Network Awards for Excellence 2007 for the article: "Comparison of Hyperelastic Material Models in the Analysis of Fabrics" published in the International Journal of Clothing Science and Technology. Volume: 18, 2006 Issue 5, pp 314–325. http://www.emeraldinsight.com/ijcst.htm

Graduates Golden Jubilee Research Prize in Aeronautics for 1997. Aeronautical Engineering Department. The University of Sydney.

Colciencias/BID Scholarship award for undertaking overseas PhD. studies. 1994.

Professional Affiliations

IACM International Association for Computational Mechanics. Since 2007

SIAM Society for Industrial and Applied Mathematics. Since 2014

ISSMO International Society for Structural and Multidisciplinary Optimization. Since 2015

ACMENICA Asociacion Colombiana de Métodos Numéricos. Since 2007. Founder member.

Publications

Books

Manuel Julio Garcia Ruiz *Optimizacion Estructural con análisis de elementos finitos de malla fija* in El método de elementos finitos y sus aplicaciones en ingeniería, Cali: Editorial Universidad Autonoma de Occidente, 2012. pag 150-192. ISBN: 978-958-8713-34-2

Manuel Julio Garcia Ruiz *Lecture Notes on Numerical Analysis* Fondo Editorial Universidad EAFIT. 2008. ISBN: 978-958-8281-92-6.

Santiago Laín , Manuel J García, François Avellan, Brian Quintero, y Santiago Orrego. *Simulación numérica de turbinas Francis* Fondo Editorial Universidad EAFIT, Editorial Universidad Autónoma de Occidente. 2011. pags 220. ISBN :978-958-720-102-4

Last Peer Reiewed Journal Articles

Raúl A. Valencia, Manuel J. García, John Bustamante *A comparative computational study of blood flow pattern in exemplary textile vascular grafts* (2017) In The Journal Of The Textile Institute. Ed. Taylor & Francis 2017,

Juan F. Monsalvo, Manuel J. García, Harry Millwatter, Yusheng Feng *Sensitivity analysis for radiofrequency induced thermal therapies using the complex finite element method* (November 2017) In: Finite Elements in Analysis and Design. 2017, Vol 135,C, p 11-21.

Garcia, Manuel, Lain, Santiago, Barbosa, Jaime, Orrego, Santiago, and Quintero, Brian. *Hydraulic and Rotor-dynamic interaction for performance evaluation on a Francis Turbine* (2017) In: International Journal on Interactive Design and Manufacturing (IJIDeM) August 2017, Volume 11, Issue 3, pp 623–632

Perez, Carlos Andres and Garcia, Manuel J. (2015). *Flow behaviour over a 2D body with free surface using a modified moving particle semi-implicit method*. (2017) In: International Journal on Interactive Design and Manufacturing (IJIDeM) Vol 11 N 3 p 633-640.

Garcia, Manuel J., Duque, Juan, Henao, Miguel, and Boulanger, Pierre (2015). *ParaVoxel: A Domain Decomposition Based Fixed Grid Preprocessor*. In: International Journal of Computational Methods 12.03, p. 1550014.

García, Manuel J., Duque, Juan, Boulanger, Pierre, and Figueroa, Pablo (2015). *Computational steering of CFD simulations using a grid computing environment*. In: International Journal on Interactive Design and Manufacturing (IJIDeM) 9.3, pp. 235–245. issn: 1955-2513. doi: 10.1007/ s12008-014-0236-1.

Manuel Garcia, Jorge Gutierrez, Nestor Rueda *Fluid-structure coupling using lattice-Boltzmann and fixed-grid FEM* Finite Elements in Analysis and Design 47 (2011) 906–912.

Manuel Garcia Ruiz, Alvin Garcia Chaves, Carlos Ruiz Ibañez, et al. *mantisGRID: A Grid Platform for DICOM Medical Images Management in Colombia and Latin America* Journal of Digital Imaging, Vol 24, No 2 (April), 2011: pp 271–283 ISSN: 0273-1223, doi: 10.1007/s10278-009-9265-x

Santiago Laín Beatove, Manuel J. García Ruiz, Brian Quintero Arboleda, Santiago Orrego Bustamante *CFD Numerical simulations of Francis turbines* Revista Facultad De Ingenieria ISSN: 0120-6230 ed: Editorial Universidad de Antioquia v.51 p.24–33, 2010

Last Peer reviewed Conference Publications

R Valencia, M Garcia, J Bustamante *Modelling of a textile endovascular graft in an aneurism with clot formation: a multi-scale approach* Particles 2007. V international conference on Particle-based Methods Hannover, Germany, 26-28 Sept 2017

Andrés Yarce and Juan Sebastián Rodríguez and Julián Galvez and Alejandro Gómez and Manuel J. García *Simple-1: Development stage of the data transmission system for a solid propellant mid-power rocket model* (2017) Journal of Physics: Conference Series, Vol 850, No 1 p 012019.

A. Y. Botero and J. S. Rodríguez and J. G. Serna and A. Gómez and M. J. García *Design, construction and testing of a data transmission system for a mid-power rocket model* 2017 IEEE Aerospace Conference. Yellowstone, US 04-11 Mar 2017 doi: 10.1109/AERO.2017.7943739

Mauricio Aristizabal, Manuel Garcia and Harry Millwater *An introduction to the OTI method to efficiently compute n-order derivatives* World congress on Structural and Multidisciplinary Optimization (WCSMO12) (2017-June, Braunschweig - Germany)

Andrés Aguirre, Manuel Garcia, Mauricio Aristizabal, Harry Millwater, *MCX: A multicomplex Finite Element Library for high order derivatives* In: World Congress on computational mechanics, July 2016. Seoul, Korea.

Jhon Fredy Hincapié and Manuel J. García (2015). "Metodología para el cálculo de chorros incidentes de llama sin simular el fenómeno de combustión." In: X Congreso Colombiano de Metodos Numericos: Simulación en Ciencias y Aplicaciones Industriales. Cartagena, Colombia, p. 5.

Garcia, Manuel, Lain, Santiago, Barbosa, Jaime, Orrego, Santiago, and Quintero, Brian (2015). *Hydraulic and Rotor-dynamic interaction for performance evaluation on a Francis Turbine* In: Virtual Concept International Workshop on Green Technologies and Agro-Mechanical Engineering. (Universidad Pontificia Bolivariana, Bucaramanga, Colombia). VC2015 1004. p. 4. isbn: 978-2-9548927-2-6.

Perez, Carlos Andres and Garcia, Manuel J. (2015). *Flow behaviour over a 2D body with free surface using a modified moving particle semi-implicit method*. In: Virtual Concept International Workshop on Green Technologies and Agro-Mechanical Engineering. (Universidad Pontificia Bolivariana, Bucaramanga, Colombia). VC2015 1004. p. 4. isbn: 978-2-9548927-2-6.

Rodriguez, Juan S. and Garcia, Manuel J. (2015). *Analysis of combustion gas flow through in a conical nozzle*. In: 15th MILSET Expo-Sciences International. Brussels, Belgium.

Ruiz, Ruber A. and García, Manuel J. (2015). *Shape Optimization of a gas injector* In: 11th World Congress on Structural and Multidisciplinary Optimization. Sydney, Australia.

Valencia, Raul, García, Manuel, and Bustamante, John (2015). *Modelling of a Textile Vascular Graft in an Aneurysm with Clot Formation using a Multi-Scale Approach* In: X Congreso Colombiano de Metodos Numericos: Simulación en Ciencias y Aplicaciones Industriales. Cartagena, Colombia, p. 5.

Monsalvo, Juan F and García, Manuel J (2015). *Complex Variable Sensitivity Analysis of the Radio Frequency Ablation Process for Cancer Treatment*. In: 1st Pan-American Congress on Computational Mechanics - PANACM 2015 XI Argentine Congress on Computational Mechanics - MECOM 2015. Buenos Aires: International Center for Numerical Methods in Engineering (CIMNE), pp. 1124–1132.

Manuel J. García, Juan Duque, Pierre Boulanger *Computational Steering of CFD Simulations inside Grid Computing Environments* En: Proceedings of the International Workshop on Innovation in Product Design and Manufacture, Medellin 2014, Paper Number: VC2014_0015, pag 1–2, ISBN: 978-2-9548927-0-2

Valencia, Raul; García, Manuel J.; Bustamante, John *Cell Migration And Mass Transport Simulation Through Vascular Graft (Porous Media) Using A Multi-Scale Approach* En: 11th World Congress on Computational Mechanics (WCCM XI) 5th European Conference on Computational Mechanics (ECCM V) 6th European Conference on Computational Fluid Dynamics (ECFD VI) July 20–25, 2014, Barcelona, Spain

Cardona, Juan S.; García, Manuel J. *A Numerical Comparison Of A Hydraulic Cavitation Bubble And A Laser-Induced Bubble* En: 11th World Congress on Computational Mechanics (WCCM XI) 5th European Conference on Computational Mechanics (ECCM V) 6th European Conference on Computational Fluid Dynamics (ECFD VI) July 20–25, 2014, Barcelona, Spain