

HERNÁN A. MELLA

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EDUCATION

Pontificia Universidad Católica de Chile, Santiago, CL

Ph.D(c). in Electrical Engineering, expected July 2020

Thesis: “Biomechanical and Hemodynamical Analysis of Cardiovascular Images”

Thesis Advisor: Sergio Uribe Ph.D.

Pontificia Universidad Católica de Valparaíso, Valparaíso, CL

Professional Diploma in Civil Engineering, July 2016

Thesis: “Subsoil Wave Velocity Estimation Based on Seismograms”

Thesis Advisor: Joaquín Mura Ph.D.

B.Sc. in Engineering Sciences, December 2014

FELLOWSHIPS AND AWARDS

CONICYT Scholarship for International Conferences, Chilean Ministry of Education, 2018

FEniCS 2017 Travel Award, Luxembourg University, 2017

CONICYT Scholarship for Doctoral Studies, Chilean Ministry of Education, 2017

#45 of 735 awarded scholarships and 1795 applicants

Outstanding Entry Scholarship, Pontificia Universidad Católica de Valparaíso, 2011

TEACHING AND RESEARCH INTERESTS

Cardiovascular Magnetic Resonance Imaging; Motion Estimation; Computational Biomechanics; Finite Element Methods; Image Processing; Inverse Problems.

TEACHING EXPERIENCE

Pontificia Universidad Católica de Valparaíso, Valparaíso, CL

Teaching Assistant, 2012-2016

Assisted Professors in the courses “Integral Calculus and Series”, “Calculus II”, “Static Mechanics”, “Dynamic Mechanics”, “Solid Mechanics” and “Numerical Analysis”. Answered student doubts about theory; taught resolution methods; created written exams; graded all written work and determined final grades.

RESEARCH EXPERIENCE

Pontificia Universidad Católica de Chile, Santiago, CL

Assistant Researcher, 2016-Today

Assisted Biomedical Imaging Center in the project “Magnetic resonance imaging technology for aging related diseases: brain, heart and vessels” PIA 1416. Worked in the development of novel methods for cardiac motion estimation.

Assistant Researcher, 2015-2017

Assisted Professor Sergio Uribe in his project “Non-invasive 3D full-field quantification of cardiovascular 4D flow MR images” FONDECYT 1141036. Helped implementing automatic algorithms for centerline detection in vessels.

Pontificia Universidad Católica de Valparaíso, Valparaíso, CL

Assistant Researcher, 2014-2015

Assisted Professor Joaquín Mura in his project “Modelling and simulation of wave propagation in poroelastic media: application to the identification of poroelastic parameters in soils from seismic waves” FONDECYT 11121606. Worked implementing absorbing boundary conditions for solving the elastodynamic equations on unbounded domains.

COMPUTING SKILLS

Programming Languages

C++ (Advanced Level); Python (Advanced Level)

Softwares

FEniCS (Advanced Level); FreeFem++ (Advanced Level); Matlab (Advanced Level); LaTeX (Advanced Level); Git (Advanced Level)

PUBLICATIONS AND PRESENTATIONS

“An Harmonic Phase Interpolation Method for the Estimation of Motion from Tagged MR Images”. Paper presented at the 27th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Montreal, CA, June 2019.

“PyMRStrain: A Python Library for the Generation of SPAMM, C-SPAMM, and DENSE Synthetic Images”. Paper presented at the 27th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Montreal, CA, June 2019.

“4D-Flow MRI and robust local Pulse Wave Velocity allow the detection of alterations in human aortas”. Paper presented (as co-author) at the 27th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Montreal, CA, June 2019.

“A Python Finite Element based Library for Strain Phantoms Generation”. Paper presented at the 26th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Paris, FR, June 2018.

“Implementation of a Mixed and Hybrid Formulation of the PML Method in Elastodynamics Using FEniCS”. Paper presented at the FEniCS Conference, Luxembourg, LU, June 2017

“Left Ventricle Strain Estimation Using Flow Data”. Paper presented at the 25th Annual Meeting of the International Society for Magnetic Resonance in Medicine. Honolulu, HI, April 2017.

MEMBERSHIPS

International Society for Magnetic Resonance in Medicine
Chilean Society for Computational Mechanics

LANGUAGES

Reading, writing and speaking competence in Spanish.
Reading, writing and speaking competence in English