Eder Medina

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Education

08/2016– **Ph.D. in Engineering Science**, Harvard University, Cambridge MA, USA.

08/2016–05/2020 **SM in Engineering Science**, Harvard University, Cambdridge MA, USA.

08/2012–05/2016 **B.Sc. in Mechanical Engineering**, *Minor in Mathematics, Certificate in Computational Science and Engineering from ICES* , University of Texas-Austin , Austin TX, USA.

09/2021 **Summer Course**, *Summer School in Computational Physiology*, Simula, (Zoom).

06/2013 **Summer Course**, *Energy Conversion Systems Program: Hybrid Geothermal Concentrated Solar Power Plant Modeling*, Middle Eastern Technical University, Ankara, Turkey.

05/2013 **Summer Course**, *Concepts of Nuclear and Radiation Technology Program*, Delft University of Technology, Delft, Netherlands.

Research Interests

Broadly: computational engineering and science, interdisciplinary mathematical modeling and simulation numerical methods, continuum mechanics.

Specifically: computational mechanics, multi-physics simulation, finite element methods, multigrid methods, inverse modeling, optimization, parallel computing, structural mechanics, bio-inspired design, advanced manufacturing, bio-physics.

Research Experiences

08/2016– **Graduate Research Assistant**, Harvard University, Bertoldi Research Group, Supervisor- Katia Beroldi.

08/2016– **Graduate Research Assistant**, Harvard University, Rycroft Research Group, Supervisor- Chris Rycroft.

08/2014–05/2016 **Undergraduate Research Assistant**, University of Texas, Center for Cardiovascular Simulation, Supervisor- Michael S. Sacks.

06/2014–08/2014 **Summer Research Intern**, Stanford University, Farhat Research Group, Supervisor- Charbel Farhat.

Honors & Awards

2021 Harvard University Certificate of Distinction in Teaching.

2016-2022 Harvard University Graduate Research Fellowship.

W2020 New England Complex Systems Institute Winter School Scholarship.

2015-2016 Harry Kent Endowed Presidential Scholarship in Mechanical Engineering.

2014-2015 John M. Scott Endowed Presidential Scholarship in M.E..

2014 Leadership Alliance Summer Early Identification Fellowship.

2013 Robert L. Mitchell Friend of Alec Excellence Fund Scholarship.

2013-2014 Mr. and Mrs. J. Russell Johnson Scholarship.

2013 Fund for Education Abroad Scholar.

2013 Turkish Coalition of America Fellowship.

2013 Gilman International Education Scholar.

2013 The University of Texas IEE Scholar.

2012 Louis C. Wagner Endowed Scholarship in Engineering.

Publications

- Zareei A., **EM**, "Summation is enough: conservation laws as regularization terms in recurrent neural networks", *In Preparation-to be submitted to ICLR 2022*
- Paul Le Floch, Siyuan Zhao, Nicola Molinari, Ren Liu, **EM**, Junsoo Kim, Hao Sheng, Sebastian Partarrieu, Chanan Sessler, Guogao Zhang, Xiao Wang, Katia Bertoldi, Boris Kozinsky, Zhigang Suo, Jia Liu, "Fluorinated elastomers for scalable single-cell brain electrophysiology ", *In Preparation-to be submitted to Nature*
- Zareei A.*, **EM***, Bertoldi K, "Harnessing Mechanical Deformation to Reduced Spherical Aberration in Soft Lenses," *Physical Review Letters*,2021;126 :084301
- **EM**, Farrell P.E., Bertold K, Rycroft CH, "Navigating the landscape of nonlinear mechanical metamaterials for advanced programmability," in *Physical Review B,* 2020; 101 :064101

Presentations

- APS March Meeting 2019: Exploring the landscape of nonlinear mechanical metamaterials
- Overview of Adjoint Methods at Numerics Journal Club - Harvard University. November 2017
- Topology Optimization Review- Harvard University. May 2018
- Automatic Differentiation draw backs and implementation- SREIP'14 Stanford University. August 2014
- On the feasibility of hybrid Geothermal-Concentrated Solar Power Plants- ISEP 2013 Ankara, Turkey. August 2013
- Pebble bed Nuclear Reactors. ISEP 2013 Ankara, Turkey. June 2013

Teaching Experiences

01/2021–05/2017 **Teaching Fellow**, AM 225 Advanced Scientific Computing: Numerical Methods II, Harvard University.

08/2017–12/2017 **Teaching Fellow**, AM 21a Multivariable Calculus, Harvard University.

Skills

- **Programming:** Python, C++, Mathematica, Matlab
- **Software:** Firedrake/FEniCS, Paraview, Linux, Latex, Abaqus, CAD
- **Manufacturing:** Additive Manufacturing, Laser Cutting, Casting

Languages

- **English:** Fluent
- **Spanish:** Native
- **French:** Beginner

Activities and Hobbies

Running, cycling, bike restoration, rugby, climbing, home brewing, block printing, pyrography, coffee brewing, guitar.