

William La Cava

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Education

2012 - today	PhD Candidate, Mechanical Engineering, University of Massachusetts Amherst
2009 - 2010	M.Eng., Mechanical Engineering, Cornell University
2005 - 2009	B.S., Mechanical Engineering, Cornell University

Research Experience

2012 - today	PhD Candidate, University of Massachusetts Amherst <i>Committee: Kourosh Danaei, Lee Spector, Matthew Lackner</i> Dissertation: Automatic model form development and adaptation NSF IGERT fellow researching offshore wind energy applications
Jun-Aug 2015	Visiting Researcher, Biosystems and Integrative Sciences Institute, University of Lisbon <i>Hosts: Sara Silva, Leonardo Vanneschi</i> Subject: Multiclass classification of complex systems using genetic programming
2010 - 2012	Research Scientist, National Renewable Energy Laboratory (NREL) <i>Supervisors: Paul Veers, Jonathan Keller</i> Lead engineer for the Gearbox Reliability Collaborative, a consortium involved in wind turbine gearbox testing, data analysis, and numerical modeling Designed and conducted drivetrain simulation and testing programs for a 3 MW wind turbine R&D project
2008 - 2010	Lead Engineer of Mechanical Power Systems, Cornell 100+ MPG Team <i>Advisor: Albert George</i> Design, fabrication and testing for a hybrid-electric vehicle that competed in the Automotive X-Prize and won the 2011 Green Grand Prix, achieving over 120 MPG
2007 - 2008	Independent Research, Cornell Computational Synthesis Laboratory <i>Advisor: Hod Lipson</i> Built and trained a mobile robot with a 5 degree-of-freedom arm and gripper to retrieve objects Built robotic platforms for an artificial intelligence course

Teaching Experience

2014 - 2015	Teaching Assistant & Lecturer, University of Massachusetts Amherst I have taught lectures in the following courses: System Dynamics; Control Systems Laboratory; Offshore Wind Design Topics: linearization; state-space representations; system identification; parameter estimation; and wind turbine control design
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Awards

2015	Best Paper Nomination, Genetic and Evolutionary Computation Conference (GECCO)
2014	XSEDE Startup Allocation Award: Automatic Identification of Dynamic Models for Complex Systems (PI)
2012	NSF Fellowship, IGERT: Offshore Wind Energy Engineering, Environmental Science, and Policy
2011	First Place, Cornell 100+ MPG Team, Green Grand Prix Competition

Publications

Articles in Review

La Cava, William, Danaï, Kourosh, and Spector, Lee (2015). "Inference of Compact Nonlinear Dynamic Models by Epigenetic Local Search". In: *Applied Soft Computing*. In Review.

Journal Articles

La Cava, William, Kourosh Danaï, Lee Spector, Paul Fleming, Alan D. Wright, and Matthew Lackner (2015b). "Automatic identification of wind turbine models using evolutionary multi-objective optimization". In: *Renewable Energy*. Accepted.

La Cava, William G. and Kourosh Danaï (2015b). "Gradient-based adaptation of continuous dynamic model structures". In: *International Journal of Systems Science* 47 (1), pp. 249–263. ISSN: 0020-7721. DOI: 10.1080/00207721.2015.1069905.

Guo, Yi, Jonathan Keller, and William LaCava (2014). "Planetary gear load sharing of wind turbine drivetrains subjected to non-torque loads". en. In: *Wind Energy* 18, pp. 757–768. ISSN: 1099-1824. DOI: 10.1002/we.1731.

LaCava, William, Yi Guo, Chris Marks, Yihan Xing, and Torgeir Moan (2013). "Three-dimensional bearing load share behaviour in the planetary stage of a wind turbine gearbox". en. In: *IET Renewable Power Generation* 7.4, pp. 359–369. ISSN: 1752-1416, 1752-1424. DOI: 10.1049/iet-rpg.2012.0274.

Conference Proceedings

La Cava, William and Kourosh Danaï (2015a). "Model Structure Adaptation: A Gradient-based Approach". In: *ASME 2015 Dynamic Systems and Control Conference*. Columbus, Ohio: ASME.

La Cava, William, Kourosh Danaï, Lee Spector, Paul Fleming, Alan D. Wright, and Matthew Lackner (2015a). "Automated Identification of Closed-Loop Wind Turbine Dynamics via Genetic Programming". In: *ASME 2015 Dynamic Systems and Control Conference*. Columbus, Ohio: ASME.

La Cava, William, Thomas Helmuth, Lee Spector, and Kourosh Danaï (2015c). "Genetic Programming with Epigenetic Local Search". In: *Proceedings of the Genetic and Evolutionary Computation Conference*. GECCO 2015. ACM Press, pp. 1055–1062. ISBN: 978-1-4503-3472-3. DOI: 10.1145/2739480.2754763.

La Cava, William, Lee Spector, Kourosh Danaï, and Matthew Lackner (2014). "Evolving differential equations with developmental linear genetic programming and epigenetic hill climbing". en. In: *Companion proceedings of the 2014 conference on Genetic and Evolutionary Computation*. GECCO 2014. ACM Press, pp. 141–142. ISBN: 978-1-4503-2881-4. DOI: 10.1145/2598394.2598491.

LaCava, William, Jonathan Keller, and Brian McNiff (2012). "Gearbox reliability collaborative: test and model investigation of sun orbit and planet load share in a wind turbine gearbox". In: *AIAA 53rd Structures, Structural Dynamics, and Materials and Colocated Conferences, Honolulu, Hawaii*.

LaCava, William, Y. Xing, Y. Guo, and Torgeir Moan (2012). "Determining wind turbine gearbox model complexity using measurement validation and cost comparison". In: *European Wind Energy Association annual event, Copenhagen*.

LaCava, William, B McNiff, and J van Dam (2011). "NREL Gearbox Reliability Collaborative: Comparing In-field Gearbox Response to Different Dynamometer Test Conditions: Preprint". In: National Renewable Energy Laboratory.

Book Chapters

Kannappan, Karthik, Lee Spector, Moshe Sipper, Thomas Helmuth, William La Cava, Jake Wisdom, and Omri Bernstein (2015). "Analyzing a Decade of Human-Competitive ("HUMIE") Winners: What Can We Learn?" In: *Genetic Programming Theory and Practice XII*. Springer, pp. 149–166.

La Cava, William and Lee Spector (2015). "Inheritable Epigenetics in Genetic Programming". In: *Genetic Programming Theory and Practice XII*. Ed. by Rick Riolo, William P. Worzel, and Mark Kotanchek. Cham: Springer International Publishing, pp. 37–51. ISBN: 978-3-319-16029-0 978-3-319-16030-6.

Technical Reports

La Cava, William and Matthew Lackner (2015a). *Theory manual for the tuned mass damper module in FAST 8*. Tech. rep. University of Massachusetts Amherst. DOI: DOI:10.13140/rg.2.1.4565.9684.

Keller, Jonathan, Hal F. Link, Yi Guo, William LaCava, Brian P. McNiff, and McNiff Light Industry (2011). *Gearbox reliability collaborative phase 1 and 2: testing and modeling results*. Tech. rep. National Renewable Energy Laboratory.

Link, H, W LaCava, J van Dam, B McNiff, S Sheng, R Wallen, M McDade, S Lambert, S Butterfield, and F Oyague (2011). *Gearbox reliability collaborative project report: findings from phase 1 and phase 2 testing*. Tech. rep. National Renewable Energy Laboratory, pp. 275–3000.

Software

La Cava, William (2015). *ellenGP*. DOI: 10.5281/zenodo.13927.

La Cava, William and Matthew Lackner (2015b). *Tuned Mass Damper Module for FAST v8*. URL: <https://nwtc.nrel.gov/tmd>.

Video

La Cava, William, et. al. (2013). *Offshore Wind in the Caribbean*. 2013 IGERT Video and Poster Competition. URL: <https://vimeo.com/65178378>.

Service

Organizer	Collaboration with University of Maine's Advanced Structures and Composites Center (2014) Gearbox Reliability Collaborative Annual Meeting, National Renewable Energy Laboratory (2011, 2012)
Member	Association of Computing Machinery (ACM) American Society of Mechanical Engineers (ASME) American Institute of Aeronautics and Astronautics (AIAA)
Referee	Renewable Energy Journal Wind Energy Journal AIAA Wind Energy Symposium (2014) ASME Dynamic Systems and Controls Conference (2015)

Volunteer & Outreach Activities

Jun - Aug 2015	NSF REU Mentor Mentored an undergraduate summer project: Using genetic programming to automatically develop models from observational data
2013 - 2014	Invited Science Teacher, Four Rivers Charter School Taught two classes on wind energy to high school students
2011 - 2012	Volunteer, Boulder Food Rescue This organization has saved hundreds of thousands of pounds of left over food from grocery stores and bakeries and delivered it to homeless shelters and other community food stations.
2001 - 2005	American Cancer Society Relay for Life

Other Interests

Film	I write, direct, and produce short fictional films, including: "MADG" (2014), <i>Sound on Sound Film Festival</i> (premiere), <i>Florence Night Out</i> "Vacuumland Trilogy" (2008), <i>The Project Competition</i>
Music	VP, Fanclub Collective, a music promotion agency in Ithaca, NY (2005 - 2010) I have written, recorded, and produced several albums Co-founder of a small record label that operates in Denver
Language	Spanish (advanced), Portuguese and Italian (beginner)
Sports	rock climbing, soccer