

Robert Y. Lewis

Contact Info

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Positions

2018 – 2020	Vrije Universiteit , Amsterdam, The Netherlands Postdoc, Theoretical Computer Science Matryoshka project
2012 – 2018	Carnegie Mellon University , Pittsburgh, PA, USA PhD, Pure and Applied Logic, 2018 MS, Mathematics, 2015 MS, Logic, Computation, and Methodology, 2014 Supervisor: Jeremy Avigad
Summer 2016	Wolfram Research , Champaign, IL, USA Intern, Mathematica Algorithms R&D
Summer 2015	University of Newcastle , NSW, Australia Visiting student, CARMA Priority Research Centre
2010 – 2012	St. Agnes Academy , Houston, TX, USA Secondary School Teacher 10 th grade geometry, 11 th and 12 th grade pre-calculus, 12 th grade AP Calculus AB
2006 – 2010	Rice University , Houston, TX, USA BA, Mathematics and Philosophy

Publications

Jeremy Avigad, Robert Y. Lewis, and Floris van Doorn. *Logic and Proof*. An online [interactive/static](#) textbook using the Lean theorem prover. Under development.

Robert Y. Lewis. *An extensible ad hoc interface between Lean and Mathematica*. In Dubois, C. and Paleo, B. W. eds., proceedings of Proof eXchange for Theorem Proving 2017 (EPTCS).

Jeremy Avigad, Robert Y. Lewis, and Cody Roux. *A heuristic prover for real inequalities*. (Journal version.) Journal of Automated Reasoning 56(3), 2016.

Jeremy Avigad, Robert Y. Lewis, and Cody Roux. *A heuristic prover for real inequalities*. In Klein, G. and Gamboa, R., eds., proceedings of Interactive Theorem Proving 2014 (Springer LNCS).

Leobardo Rosales, Robert Y. Lewis, et. al. *Energy-minimizing unit vector fields*. Involve 3(4), 2010.

Selected Presentations

A heuristic method for formally verifying real inequalities.

- [Matryoshka 2018](#), Amsterdam, The Netherlands. 06/2018.
- [Hales60](#), Pittsburgh, PA, USA. 06/2018. (Invited speaker.)

Toward AI for Lean, via metaprogramming.

- [AITP 2018: Artificial Intelligence in Theorem Proving](#), Aussois, France. 03/2018.

The Lean theorem prover, for mathematicians.

- Department of Mathematics foundations seminar, Western University, London, ON, Canada. 12/2017.

An extensible ad hoc interface between Lean and Mathematica.

- [International Congress on Mathematical Software](#), South Bend, IN, USA. 07/2018.
- [Proof eXchange for Theorem Proving workshop](#), Brasilia, Brazil. 09/2017.
- [Wolfram Technology Conference](#), Champaign, IL, USA. 10/2016.

Automation and computation in the Lean theorem prover.

- [Hammers for Type Theory workshop](#), IJCAR, Coimbra, Portugal. 07/2016.
- [AITP 2016: Artificial Intelligence in Theorem Proving](#), Obergurgl, Austria. 04/2016.
- TU München Logic and Verification Seminar, Munich, Germany. 03/2016.

Algebra and analysis in the Lean theorem prover.

- [MAP 2016: Effective Analysis](#), Marseille, France. 01/2016.

Dependent types and the algebraic hierarchy.

- [Workshop on Mathematics and Computation](#), Newcastle, NSW, Australia. 06/2015.

A heuristic prover for real inequalities.

- [ITP 2014: Interactive Theorem Proving](#), Vienna, Austria. 07/2014.
- [6th Podlasie Conference on Mathematics](#), Bialystok, Poland. 07/2014.
- CMU Graduate Research Sharing Forum, Pittsburgh, PA. 12/2013.

Computers in mathematics: automated and interactive proofs.

- CMU Summer School in Logic and Formal Epistemology. 06/2014.

Energy-minimizing vector fields of unit length.

- Rice University VIGRE Summer Seminar. 07/2009.

Teaching

All classes at Carnegie Mellon University, unless otherwise indicated.

Spring 2018	<i>Logic and Modeling</i> (VU, teaching assistant)
Fall 2016	80-211, <i>Logic and Mathematical Inquiry</i> (instructor)
Spring 2015	80-110, <i>Nature of Mathematical Reasoning</i> (instructor)
Fall 2014	21-257, <i>Models and Methods of Optimization</i> (teaching assistant)
Summer 2014	80-110, <i>Nature of Mathematical Reasoning</i> (instructor)
Spring 2014	80-311, <i>Undecidability and Incompleteness</i> (grader)
Fall 2013	80-610, <i>Formal Logic</i> (grader and guest lecturer)
2010 – 2012	<i>Geometry, Pre-calculus, AP Calculus AB</i> (St. Agnes Academy, instructor)
2007 – 2010	MATH 221/222/354, <i>Honors Calculus III/IV, Honors Linear Algebra</i> (Rice, grader)

Students

2018	Pablo Le Hénaff (MS intern, VU Amsterdam)
2018	Miko Kuijn (MS, VU Amsterdam)

Service

2018	ICMS Session organizer, <i>Formal and Informal Mathematical Corpora</i>
2018	AISC Program Committee
2015, 2016	CMU Dept. Philosophy Graduate Admissions Committee
2015	CMU Dept. Philosophy 30 th Anniversary Conference Planning Committee
2013 – 2017	Organizer, CMU Philosophy Dept. Graduate Research Sharing Forum
2011 – 2012	Coach and Sponsor, St. Agnes Academy Engineering/Robotics Team
2008 – 2010	Coordinator and tutor, SRC Society of Academic Fellows, Rice University

Awards, Grants, and Honors

2017	Laboratory of Symbolic and Educational Computation research fellowship
2017	Future Faculty , Eberly Center for Teaching Excellence & Educational Innovation
2015 – 2016	William S. Dietrich II Presidential PhD Fellowship
2014	Honorable Mention, NSF Graduate Research Fellowship Program