

Robert Y. Lewis

CONTACT INFO

Email: r.y.lewis@vu.nl / rob.y.lewis@gmail.com
Website: <http://robertylewis.com>
Address: W&N Building, Room S-414
Department of Computer Science
Vrije Universiteit Amsterdam
De Boelelaan 1081a
1081 HV Amsterdam, The Netherlands

POSITIONS

- 2018 – Present **Vrije Universiteit Amsterdam**, The Netherlands
Postdoc, Theoretical Computer Science
Hired through the [Matryoshka](#) ERC Starting Grant
- 2012 – 2018 **Carnegie Mellon University**, Pittsburgh, PA, USA
PhD, Pure and Applied Logic, 2018
MS, Mathematics, 2015
MS, Logic, Computation, and Methodology, 2014
- 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
10th grade geometry, 11th and 12th grade pre-calculus, 12th grade AP Calculus AB
- 2006 – 2010 **Rice University**, Houston, TX, USA
BA, Mathematics and Philosophy

PEER REVIEWED PUBLICATIONS

The Lean mathematical library.

The mathlib Community.

In Blanchette, J., Hritcu, C., eds., *9th ACM SIGPLAN International Conference on Certified Programs and Proofs* (CPP 2020), pp. 367-381. 2020.

This paper describes a collective project with many contributors. I am a maintainer of the project and wrote much of this paper.

Formalizing the solution to the cap set problem.

Sander Dahmen, Johannes Hölzl, and Robert Y. Lewis.

In Harrison, J., O’Leary, J., and Tolmach, A., eds., *Interactive Theorem Proving* (ITP 2019), pp. 15:1-15:19. 2019.

A formal proof of Hensel’s lemma over the p -adic integers.

Robert Y. Lewis.

In Mahboubi, A., Myreen, M. O., eds., *8th ACM SIGPLAN International Conference on Certified Programs and Proofs* (CPP 2019), pp. 15-26. 2019.

An extensible ad hoc interface between Lean and Mathematica.

Robert Y. Lewis.

In Dubois, C. and Paleo, B. W. eds., *Proof eXchange for Theorem Proving 2017* (EPTCS), pp. 23-38. 2017.

A heuristic prover for real inequalities. Journal version.

Jeremy Avigad, Robert Y. Lewis, and Cody Roux.

Journal of Automated Reasoning 56(3), pp. 367-386. 2016.

A heuristic prover for real inequalities.

Jeremy Avigad, Robert Y. Lewis, and Cody Roux.

In Klein, G. and Gamboa, R., eds., *Interactive Theorem Proving* (ITP 2014), pp. 61-76. 2014.

Energy-minimizing unit vector fields.

Leobardo Rosales, Robert Y. Lewis, et al.

Involve 3(4), pp. 435-450. 2010.

BOOKS, THESES, AND DRAFTS

A bi-directional extensible ad hoc interface between Lean and Mathematica. Draft.

Robert Y. Lewis and Minchao Wu.

Logic and Proof. A textbook using the Lean theorem prover.

Jeremy Avigad, Robert Y. Lewis, and Floris van Doorn.

Available freely in [interactive](#) and [static](#) versions.

Two Tools for Formalizing Mathematical Proofs. Dissertation.

Robert Y. Lewis.

Certified Feb 16, 2018.

Polya: A Heuristic Procedure for Reasoning with Real Inequalities. MS thesis.

Robert Y. Lewis.

Certified Dec 11, 2014.

SELECTED PRESENTATIONS

The Lean mathematical library.

- [CPP 2020: Certified Programs and Proofs](#), New Orleans, LA, USA. 01/2020.

Formalizing the solution to the cap set problem.

- [ITP 2019: Interactive Theorem Proving](#), Portland, OR, USA. 09/2019.
- [Vietnam-USA Joint Mathematical Meeting](#), Quy Nhon, Vietnam. 06/2019.
- [CARMA Workshop on Computer-Aided Proof](#), Newcastle, NSW, Australia. 06/2019. (Invited speaker.)

A formal proof of Hensel's lemma over the p -adic integers.

- [CPP 2019: Certified Programs and Proofs](#), Cascais, Portugal. 01/2019.
- [Lean Together 2019](#), Amsterdam, The Netherlands. 01/2019.

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.

- Western University Mathematics Dept. Foundations Seminar, London, ON, Canada. 12/2017.

An extensible ad hoc interface between Lean and Mathematica.

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

Automation and computation in the Lean theorem prover.

- [HaTT: Hammers for Type Theory](#), 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, Pittsburgh, PA. 06/2014.

Energy-minimizing vector fields of unit length.

- Rice University VIGRE Summer Seminar, Houston, TX. 07/2009.

TEACHING

Spring 2020	Logic and Modeling (VU, instructor)
Spring 2019	Logic and Modeling (VU, instructor)
Spring 2018	Logic and Modeling (VU, teaching assistant)
Fall 2016	Logic and Mathematical Inquiry (CMU, instructor)
Spring 2015	Nature of Mathematical Reasoning (CMU, instructor)
Fall 2014	Models and Methods of Optimization (CMU, teaching assistant)
Summer 2014	Nature of Mathematical Reasoning (CMU, instructor)
Spring 2014	Undecidability and Incompleteness (CMU, grader and guest lecturer)
Fall 2013	Formal Logic (CMU, grader and guest lecturer)
2010 – 2012	Geometry, Pre-calculus, AP Calculus AB (St. Agnes Academy, instructor)
2007 – 2010	Honors Calculus III/IV, Honors Linear Algebra (Rice, grader)

STUDENTS

All students at VU Amsterdam.

2019	Kevin Kappelmann (MS intern)
2019	Paul-Nicolas Madelaine (MS intern)
2018 – 2019	Markos Dermitzakis (BS thesis)
2018 – 2019	Phillip Lippe (MS research assistant)
2018 – 2019	Miko Kuijn (MS thesis)
2018	Pablo Le Hénaff (MS intern)

AWARDS, GRANTS, AND HONORS

- 2019 – 2023 Senior Collaborator, [Lean Forward](#) NWO Vidi grant
- 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

SERVICE

- 2020 Organizer, [Formal Methods in Mathematics / Lean Together](#) workshop
- 2019 – Maintainer, Lean [mathlib](#) library
- 2019 Organizer, [Lean Together](#) workshop
- 2018 Organizer, [ICMS](#) session on [Formal and Informal Mathematical Corpora](#)
- 2018 [Artificial Intelligence and Symbolic Computation](#) Conference Program Committee
- 2015, 2016 CMU Philosophy Dept. Graduate Admissions Committee
- 2015 CMU Philosophy Dept. 30th Anniversary Conference Planning Committee
- 2014 – 2018 Founding member, CMU chapter of [Minorities and Philosophy](#)
- 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