

# Floris van Doorn

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<http://florisvandoorn.com>

## Education

- 2013-        Ph.D. student in Pure and Applied Logic, Carnegie Mellon University.  
              Thesis: On the Formalization of Higher Inductive Types and Synthetic Homotopy Theory.  
              Advisor: Jeremy Avigad.
- 2011-2013    M.Sc. (cum laude), Mathematical Sciences, Utrecht University.  
              Thesis: Explicit convertibility proofs in Pure Type Systems.  
              Advisor: Freek Wiedijk.
- 2008-2011    B.Sc. (cum laude), Mathematics, Utrecht University.
- 2008-2011    B.Sc. (cum laude), Physics and Astronomy, Utrecht University.

## Publications

- 2017 “Homotopy Type Theory in Lean,” with Jakob von Raumer and Ulrik Buchholtz. *8th International Conference on Interactive Theorem Proving (ITP)*.
- 2016 “Constructing the Propositional Truncation using Non-recursive HITs.” *The 5th ACM SIGPLAN Conference on Certified Programs and Proofs (CPP)*.
- 2015 “The Lean Theorem Prover (system description),” with Leonardo de Moura (first author), Soonho Kong, Jeremy Avigad and Jakob von Raumer. *The 25th jubilee edition of the International Conference on Automated Deduction (CADE)*.
- 2014 “The Structural Theory of Pure Type Systems,” with Cody Roux (first author). *LNCS Advanced Research in Computing and Software Science 2014*.
- 2013 “Explicit convertibility proofs in Pure Type Systems,” with Herman Geuvers and Freek Wiedijk. *Proceedings of the Workshop on Logical Frameworks and Meta-languages: Theory and Practice (LFMTP), 25-36, 2103*.

## Invited Talks

- 2017 “Formalized Spectral Sequences in Homotopy Type Theory,” *Algebra, Combinatorics, and Geometry seminar*, University of Pittsburgh (two talks).
- 2017 “Homotopy Type Theory in Lean,” *Computer-aided mathematical proof*, Cambridge.
- 2017 “The Lean HoTT library,” *Big Proof*, Cambridge.
- 2017 “Eilenberg-MacLane spaces in Homotopy Type Theory,” *ASL North American annual meeting*, Boise.
- 2016 “Homotopy Type Theory in Lean,” *Univalent Foundations and Proof Assistants, ICMS*.
- 2016 “Homotopy Type Theory in Lean,” *Workshop on Homotopy Type Theory / Univalent Foundations*, colocated with FSCD.

- 2016 “Reducing higher inductive types to quotients,” *Workshop on Homotopy Type Theory and Univalent Foundations of Mathematics*, Fields Institute Toronto.
- 2016 “The Lean Theorem Prover and Homotopy Type Theory,” talk together with Jeremy Avigad. *Workshop on Homotopy Type Theory and Univalent Foundations of Mathematics*, Fields Institute Toronto.

## Teaching

- 2016 TA for Differential and Integral Calculus with Russell C. Walker (CMU).
- 2015 TA for Logic and Mathematical Inquiry with Jeremy Avigad (CMU).
- 2015 TA for Game Theory with Adam Bjorndahl (CMU).
- 2014 TA for Formal Logic with Steve Awodey (CMU).
- 2012 TA for Discrete Mathematics with Han Hoogeveen (Utrecht).
- 2011 TA for Foundations of Mathematics with Jaap van Oosten (Utrecht).

## Awards

- 2012 First prize at the International Mathematics Competition for University Students.
- 2011 Second prize at the International Mathematics Competition for University Students.
- 2010 Second prize at the International Mathematics Competition for University Students.
- 2009 KHMW “Jong Talent Aanmoedigingsprijs” (lit. “Young Talent Incentive Price”) for mathematics.
- 2008 Silver medal at the International Mathematical Olympiad.

## Unpublished Work

- 2016 “Logic and Proof,” Jeremy Avigad, Robert Y. Lewis, Floris van Doorn. Online textbook for the course Logic and Mathematical Inquiry, [http://avigad.github.io/logic\\_and\\_proof/](http://avigad.github.io/logic_and_proof/).
- 2015 “The Lean Theorem Prover,” Floris van Doorn. Blog post, <http://homotopytypetheory.org/2015/12/02/the-proof-assistant-lean/>.
- 2015 “Constructing the Propositional Truncation using Nonrecursive HITs,” Floris van Doorn. Blog post, <http://homotopytypetheory.org/2015/07/28/constructing-the-propositional-truncation-using-nonrecursive-hits/>.
- 2014 “Propositional Calculus in Coq,” Floris van Doorn. arXiv:1503.08744.

## Service

- 2017 Reviewed manuscript for the special issue of the Journal of Automated Reasoning, “Milestones in Interactive Theorem Proving”.
- 2017 Reviewed manuscript for TYPES 16 POSTPROCEEDINGS.

## Extracurricular University Service

- 2009-2013 Trainer of the Dutch Mathematical Olympiad.
- 2008-2013 Volunteer for the “Vierkant voor Wiskunde” mathematics summer camps.
- 2012-2013 Chairman of the Benelux Mathematical Olympiad 2013.
- 2011-2012 Treasurer of the Dutch University Mathematical Olympiad 2012.
- 2009-2011 IT committee member for the International Mathematical Olympiad 2011.
- 2009-2010 Head awards ceremony of the Benelux Mathematical Olympiad 2010.
- 2008-2009 Secretary of the Benelux Mathematical Olympiad 2009.

## Languages

Dutch (native), English (fluent), German (basic), French (basic).  
Programming:  $\text{\LaTeX}$ , Lean, Mathematica, Coq.  
Some experience in C, Python, Standard ML.