

Fredrik Nordvall Forsberg

Computer and Information Sciences
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Curriculum vitae

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Research interests

- Martin-Löf Type Theory
- Constructive logic and mathematics
- Advanced inductive definitions
- Category theory
- Data types for dependently typed programming
- Functional Programming

Education / Employment

December **Research Staff**, *Computer and Information Sciences*, University of Strathclyde.

2013– Working on EPSRC grant EP/K023837/1, *Logical Relations for Program Verification*. Principal Investigator: Neil Ghani.

2013 **Postdoctoral Research Fellow**, *School of Computer Science*, University of Birmingham, June – December.

Working on EPSRC grant EP/K015214/1, *A Higher-Order Approach to Co-design*. Principal Investigator: Dan Ghica.

2009–2013 **PhD**, *Computer Science*, Swansea University.

Funded by EPSRC grant EP/G033374/1, *Theory and applications of induction-recursion*. PhD thesis *Inductive-inductive definitions* supervised by Anton Setzer.

2004–2009 **Magister**, *Mathematics*, Uppsala university.

Master thesis *Constructive aspects of models for non-standard analysis* supervised by Erik Palmgren.

As visitor:

2012 **Short term research fellow**, *Mathematics department*, Ludwig-Maximilians-Universität München, 5 months July – November.

Funded by the Marie Curie Initial Training Network in Mathematical Logic – MALOA, PITN-GA-2009-238381. Visited Helmut Schwichtenberg.

2006–2007 **ERASMUS exchange year**, *Mathematics, computer science*, Ruprecht-Karls-Universität Heidelberg.

Teaching assistant experience

2013 **University of Birmingham**, 06-22754.1 *Foundations of Computer Science*.

2010 – 2011 **Swansea University**, CS-210 *Concurrency*, CS-236 *Language and Computation*.

2007 – 2008 **Uppsala University**, *Linear Algebra*, *Calculus*, *Multivariable Calculus*.

2007 **Ruprecht-Karls-Universität Heidelberg**, *Algorithmen und Datenstrukturen*.









Organisational duties

2010–2013 **Proof, Complexity and Verification seminar**, Swansea, co-organiser.

2011–2012 **Categorical logic seminar**, Swansea, organiser.

2012–2013 **Realizability seminar**, Swansea, organiser.

Publications

-  Fredrik Nordvall Forsberg. **Inductive-inductive definitions**. PhD thesis. Swansea University, 2013.
-  Neil Ghani, Lorenzo Malatesta and Fredrik Nordvall Forsberg. **Positive Induction-Recursion**. Invited paper in *Conference on Algebra and Coalgebra in Computer Science*, volume 8089 of *Lecture Notes in Computer Science*, pages 19 – 33. Springer, 2013.
-  Neil Ghani, Lorenzo Malatesta, Fredrik Nordvall Forsberg and Anton Setzer. **Fibred Data Types**. In *Logic in Computer Science*, pages 243 – 252, 2013.
-  Kenji Miyamoto, Fredrik Nordvall Forsberg and Helmut Schwichtenberg. **Program Extraction from Nested Definitions**. In *Interactive Theorem Proving*, volume 7998 of *Lecture Notes in Computer Science*, pages 370 – 385, Springer, 2013.
-  Fredrik Nordvall Forsberg and Anton Setzer. **A finite axiomatisation of inductive-inductive definitions**. In *Logic, Construction, Computation*, 2012.
-  Thorsten Altenkirch, Peter Morris, Fredrik Nordvall Forsberg, and Anton Setzer. **A categorical semantics for inductive-inductive definitions**. In *Conference on Algebra and Coalgebra in Computer Science*, volume 6859 of *Lecture Notes in Computer Science*, pages 70 – 84, Springer, 2011.
-  Fredrik Nordvall Forsberg and Anton Setzer. **Inductive-inductive definitions**. In *Computer Science Logic*, volume 6247 of *Lecture Notes in Computer Science*, pages 454 – 468, Springer, 2010.
-  Fredrik Nordvall Forsberg. **Constructive aspects of models for non-standard analysis**. Magister thesis. *U.U.D.M. Project report 2009:10*, Uppsala University, 2009.

Invited seminar presentations

- 2012/11/27 **Oberseminar Theoretische Informatik**, LMU Munich, Germany. *Internalizing inductive-inductive definitions in Martin-Löf Type Theory*.
- 2012/07/11 **Oberseminar Mathematische Logik**, LMU Munich, Germany. *Inductive-inductive definitions in dependent type theory*.
- 2011/11/03 **CLOG seminar**, University of Leicester, UK. *Data types in dependent type theory*.
- 2011/10/28 **Theoretical computer science seminar**, University of Birmingham, UK. *Inductive-inductive definitions: axiomatisation and categorical semantics*.
- 2010/07/29 **Mathematically Structured Programming seminar**, University of Strathclyde, Glasgow, UK. *Inductive-inductive definitions as initial dialgebras*.
- 2010/11/12 **Functional Programming Lab seminar**, University of Nottingham, UK. *Interpreting inductive-inductive definitions as indexed inductive definitions*.

Refereeing

- Journals Logical Methods in Computer Science, Progress in Informatics.
- Conferences Logic In Computer Science, Typed Lambda Calculus and Applications, Computability in Europe.

— Languages

○ Swedish **Native** ○ English **Fluent** ○ German **Good**

— Computer skills

Languages Haskell, SML, Scheme, L^AT_EX, C, Java.

Proof assistants Agda, Coq, Minlog.

Development Contributed to the development of Agda (anonymous pattern matching functions) and Minlog (program extraction to Haskell).