

Curriculum Vitae

Federico Aschieri

September 27, 2019

1 Curriculum Vitae: Federico Aschieri

1.1 Personal Information

Full Name: Federico Aschieri

Birthdate: 1981

Place of Birth: Verona, Italy

Nationality: Italian

Email: federico.aschieri@tuwien.ac.at

Professional Address: Institut für ComputerSprachen; TU Wien; Favoritenstraße 9-11, 1040 Wien, Austria

Web Page: <http://www.dmg.tuwien.ac.at/aschieri>

1.2 Main Areas of Research

Computational Logic, Type Theory, Lambda Calculus, Parallel functional programming, Proof Theory and Complexity.

1.3 Academic Career

- August 2011: **PhD in Computer Science** at Queen Mary, University of London, UK.
Date of PhD Thesis Defense: March 2011, London.
- April 2011: **PhD in Computer Science** at University of Turin, Italy.
Date of PhD Thesis Defense, April 2011, Turin.
- October 2007: **Laurea Degree in Computer Science** (5 years, equivalent to a Bachelor and Master Degree in Computer Science), University of Verona, Italy.

1.4 Academic Positions held to Date

- 1st January 2019 – to date
Senior Post-doc researcher funded by FWF (Austrian Science Fund) at the Institut für Diskrete Mathematik und Geometrie, TU Wien (Vienna, Austria). I work as Principal investigator on my project: *On the Computational Interpretation of Intermediate Logics*.
- 1st November 2017 – 31st December 2018
Senior Post-doc researcher at the Institut für Logic and Computation, TU Wien (Vienna, Austria).
Supervisor: Agata Ciabattoni.

- 1st November 2015 – 31st October 2017
Senior Post-doc researcher as **Lise Meitner Fellow** funded by FWF (Austrian Science Fund) at the Institut für Diskrete Mathematik und Geometrie, TU Wien (Vienna, Austria). I worked as Principal investigator on my project: *Curry-Howard, Game Semantics and Herbrand’s Theorem*. Co-applicant: Stefan Hetzl.
- 1st October 2014 – 30th October 2015
Post-doc researcher as Project assistant at the Institut für Diskrete Mathematik und Geometrie; TU Wien (Vienna, Austria). Supervisor: Stefan Hetzl.
- 1st October 2012 – 30th September 2014
Post-doc researcher as **Labex MILYON Fellow** (Laboratoire d’Excellence en Mathématique et Informatique Fondamental de Lyon), at Ecole Normale Supérieure de Lyon, Université de Lyon, LIP, équipe Plume (Lyon, France). The position has been funded by MILYON for working on my own project: *Computational Content of Classical Proofs*. Supervisor: Alexandre Miquel.
- 3rd October 2011 – 1st October 2012
Post-doc researcher INRIA-Paris at Laboratoire PPS (Preuves, Programmes et Systèmes), INRIA- πr^2 équipe, Université Paris Diderot – Paris 7 (Paris, France). Supervisor: Hugo Herbelin.
- 1st January 2008 – 31st December 2010
PhD student in Computer Science under a joint agreement between:
 Computer Science Department, University of Turin, Italy
 (supervisor: prof. Stefano Berardi)
 and
 School of Electronic Engineering and Computer Science, Queen Mary, University of London, UK
 (supervisor: dr. Paulo Oliva)

1.5 Phd Thesis

- F. Aschieri
Learning, Realizability and Games in Classical Arithmetic
 Supervisors: prof. Stefano Berardi and dr. Paulo Oliva
 Reviewers: prof. Ulrich Berger and prof. Pierre-Louis Curien
 April 2011

Extract from the reviewers’ reports:

“The results of the thesis are new, highly non-trivial and in places unexpected. They constitute a major advance in the quest for exploiting the constructive content of non-constructive proofs. [...] The technical qualities of the thesis are impressive.”

1.6 Research Projects Funded in The Past

- January 2019- to date. **Research Grant** funded by FWF (Austrian Science Fund) for working as Principal investigator on my project: *On the Computational Interpretation of Intermediate Logics*. Fellowship amount: **298.000 €**.

- November 2015 – October 2017. **Lise Meitner senior postdoctoral fellowship** funded by FWF (Austrian Science Fund) for working as Principal investigator on my project: *Curry-Howard, Game Semantics and Herbrand’s Theorem*. Fellowship amount: **159.000 €**.
- October 2012 – September 2014. **Labex Milyon postdoctoral fellowship** (Laboratory of Excellence in Mathematics and Fundamental Informatics in Lyon) for working as Principal investigator on my project: *Computational Content of Classical Proofs* (<http://milyon.universite-lyon.fr/recherche/les-post-doctorants/les-post-doctorants-2012/>). Grant consisting in two years of postdoc salary.

1.7 Academic Prizes

- Silver Medal as finalist in the *Kurt Gödel Research Prize Fellowship 2010* competition with the paper: *A Constructive Analysis of Learning in Peano Arithmetic*

1.8 Most Important Invitations to Present at Scientific Conferences

- F. Aschieri
Towards a Concurrent Lambda Calculus (via Linear Logic)
Invited speaker at the Workshop: Proof, Computation, Complexity, Stockholm, 14-19 July 2019.
- F. Aschieri
Intermediate logics: from Natural Deduction to Parallel Computation
Invited speaker at the Symposium: Humboldt-Kolleg “Proof Theory as Mathesis Universalis”, Como, Italy, July 24, 2017.
- F. Aschieri
Game Semantics and the Complexity of Cut-Elimination
Invited speaker at the Symposium: Applied Proof Theory and the Computational Content of Mathematics, Salzburg, Austria, September 14, 2017.
- F. Aschieri
From Intuitionistic Realizability to Classical Realizability
Invited speaker at the Workshop: Proofs, Justifications, Certificates, Toulouse, France, June 3, 2016.
- F. Aschieri
Recent Results on Markov’s Principle and Herbrand’s Theorem
Invited talk at the Workshop: Mathematical Logic: Proof Theory and Constructive Mathematics, Oberwolfach, Germany, November 18, 2014.
- F. Aschieri
Realizability and Learning in Classical Arithmetic
Invited speaker at the Workshop: Recent Advancements in Type Theory, Mathematical Structures of Computation, Lyon, France January 13, 2014.
- F. Aschieri
Interactive Realizability for Classical Peano Arithmetic with Skolem Axioms
Invited talk at the Workshop: Collegium Logicum, Paris, France, November 16, 2012.

1.9 Committees

- **Program Committee member** of the workshop **CL&C 2018** (Classical Logic and Computation)
- **Program Committee member** of the workshop **GaLoP 2018** (Games for Logic and Programming Languages XIII)
- **Program Committee member** of the conference **FSCD 2017** (Formal Structures for Computation and Deduction)

1.10 Supervision and Teaching

- **Supervision** of Francesco A. Genco as research assistant, Jan. 2019 – May 2019.
- **Co-supervision** of the Master Thesis of Matteo Manighetti, TU Wien: *Computational Interpretations of Markov's Principle*, October 2016.
- **Co-supervision** of the PhD Thesis of Francesco A. Genco, TU Wien, title: *Intermediate Logics and Concurrent λ -calculi: a Proof-theoretical Approach*, Nov. 2015 – Jan. 2019.
- **Teaching assistant** (TD, travaux dirigés, 32 hours) for the course “Logic”, L3, at the ENS de Lyon, Université de Lyon, January 2014 – May 2014.
- **Lecturer** at the **RiSE/SHiNE Winter School** (<http://www.kr.tuwien.ac.at/events/risews2018/>), 6 hours, February 2018.
- **Lecturer** at the **International Tbilisi Summer School in Logic and Language 2017**, 4 hours, September 2017.
- **Lecturer** for the course **Lambda Calculus**, 24 hours, at TU Wien, March 2018 – June 2018.
- **Lecturer** for the course **Theoretical Computer Science and Logic**, 4 hours, at TU Wien, November 2018 – December 2018.
- **Lecturer** for the course **Lambda Calculus**, 24 hours, at TU Wien, March 2019 – June 2019.

2 List of all Publications

A copy of each of the following publications can be found on my website.

2.1 Journal Publications and Book Chapters

- F. Aschieri
Game Semantics and the Geometry of Backtracking: a New Complexity Analysis of Interaction
The Journal of Symbolic Logic, vol. 82, n. 2, pp. 672–708, 2017.
- F. Aschieri
On Natural Deduction for Herbrand Constructive Logics I: Curry-Howard Correspondence for Dummett's Logic LC
Logical Methods in Computer Science, vol. 12, issue 3, pp. 1–31, 2016.
- F. Aschieri, M. Zorzi
On Natural Deduction in Classical First-Order Logic: Curry-Howard Correspondence, Strong Normalization and Herbrand's Theorem
Theoretical Computer Science, vol. 625, pp. 125–146, 2016.
- F. Aschieri
Constructive Forcing, CPS Translations and Witness Extraction in Interactive Realizability
Mathematical Structures in Computer Science, 2015.
doi:10.1017/S0960129515000468
- F. Aschieri
Interactive Realizability for Second-Order Heyting Arithmetic with EM1 and SK1
Mathematical Structures in Computer Science, vol. 24, n. 6, 2014.
- F. Aschieri
Learning Based Realizability for HA + EM1 and 1-Backtracking Games: Soundness and Completeness
Annals of Pure and Applied Logic, vol. 164, n. 6, 2013.
- F. Aschieri
A Constructive Analysis of Learning in Peano Arithmetic
Annals of Pure and Applied Logic, vol. 162, n. 11, 2012.
- F. Aschieri, S. Berardi
A New Use of Friedman's Translation: Interactive Realizability
in **Logic, Construction, Computation**, Berger et al. editors, Ontos Mathematical Logic, Ontos-Verlag, De Gruyter, 2012.
- F. Aschieri, S. Berardi
Interactive Learning-Based Realizability for Heyting Arithmetic with EM1
Logical Methods in Computer Science, vol. 6, issue 3, n. 19, 2010.
- C. Biasi, F. Aschieri
A Term Assignment for Polarized Bi-Intuitionistic Logic and its Strong Normalization
Fundamenta Informaticae, vol. 84, n. 2, 2008.

2.2 Peer-Reviewed Conference Proceedings

- F. Aschieri
Natural Deduction and Normalization Proofs for the Intersection Type Discipline.
Proceedings of **Intersection Types and Related Systems (DCM/ITRS 2018)**, Electronic Proceedings in Theoretical Computer Science, vol. 293, pp. 29–37, 2019.
- F. Aschieri, A. Ciabattoni, F. A. Genco
Classical Proofs as Parallel Programs
Proceedings of Games, Automata, Logics, and Formal Verification (GANDALF 2018), to appear, 2018.
- F. Aschieri
On Natural Deduction for Herbrand Constructive Logics III: The Strange Case of the Intuitionistic Logic of Constant Domains
Classical Logic and Computation 2018 (CL&C 2018), Electronic Proceedings in Theoretical Computer Science, vol. 281, 2018.
- F. Aschieri, A. Ciabattoni, F. Genco
Gödel Logic: from Natural Deduction to Parallel Computation
Proceedings of **Logic in Computer Science 2017 (LICS 2017)**.
- F. Aschieri, M. Manighetti
On Natural Deduction for Herbrand Constructive Logics II: Curry-Howard Correspondence for Markov's Principle in First-Order Logic and Arithmetic
Post-Proceedings of **TYPES 2016**, Leibniz International Proceedings in Informatics, vol. 97, pp. 4:1–4:17, 2016.
- F. Aschieri, M. Zorzi
A “Game Semantical” Intuitionistic Realizability Validating Markov's Principle
Post-Proceedings of **TYPES 2013**, Leibniz International Proceedings in Informatics, vol. 26, 2014.
- F. Aschieri
Strong Normalization for $HA + EM1$ by Non-Deterministic Choice
Workshop on Control Operators and their Semantics 2013 (COS 2013), Electronic Proceedings in Theoretical Computer Science, vol. 127, 2013.
- F. Aschieri, S. Berardi, G. Birolò
Realizability and Strong Normalization for a Curry-Howard Interpretation of $HA + EM1$
Computer Science Logic 2013 (CSL 2013), Leibniz International Proceedings in Computer Science, vol. 23, 2013.
- F. Aschieri, M. Zorzi
Non-Determinism, Non-Termination and the Strong Normalization of System T
Typed Lambda Calculi and Applications 2013 (TLCA 2013), Springer Lecture Notes in Computer Science, vol. 7941, 2013.
- F. Aschieri, M. Zorzi
Interactive Realizability and Elimination of Skolem Functions in Peano Arithmetic
Classical Logic and Computation 2012 (CL&C 2012), Electronic Proceedings in Theoretical Computer Science, vol. 97, 2012.

- F. Aschieri
Interactive Realizability for Classical Peano Arithmetic with Skolem Axioms
Computer Science Logic 2012 (CSL 2012), Leibniz International Proceedings in Informatics, vol. 16, 2012.
- F. Aschieri
Transfinite Update Procedures for Predicative Systems of Analysis
Computer Science Logic 2011 (CSL 2011), Leibniz International Proceedings in Informatics, vol. 12, 2011.
- F. Aschieri
Interactive Learning Based Realizability and 1-Backtracking Games
Classical Logic and Computation 2010 (CL&C 2010), Electronic Proceedings in Theoretical Computer Science, vol. 47, 2011.
- F. Aschieri, S. Berardi
Interactive Learning-Based Realizability Interpretation for Heyting Arithmetic with EM1
Typed Lambda Calculi and Applications 2009 (TLCA 2009), Springer Lecture Notes in Computer Science, vol. 5608, 2009.

3 International talks and seminars

- F. Aschieri
From Intuitionistic Realizability to Classical Realizability
Invited speaker at the Workshop: Proofs, Justifications, Certificates, Toulouse, France, June 3, 2016.
- F. Aschieri
Game Semantics and the Complexity of Interaction
Talk at the Workshop: GaLoP, Eindhoven, 2 April, 2016.
- F. Aschieri
On Classical Natural Deduction: Reduction Rules, Strong Normalization, Herbrand's Theorem
Talk at the Workshop: General Proof Theory, Tübingen, 28 November, 2015.
- F. Aschieri
Type Theory, Realizability and the Epsilon Substitution Method
Talk at the Workshop: Epsilon 2015, Montpellier, June 11, 2015.
- F. Aschieri
Intuitionistic Realizability and Program Extraction
Invited seminar, University of Innsbruck, June 3, 2015.
- F. Aschieri
Recent Results on Markov's Principle and Herbrand's Theorem
Invited talk at the Workshop: Mathematical Logic: Proof Theory and Constructive Mathematics, Oberwolfach, November 18, 2014.
- F. Aschieri
A "Game Semantical" Intuitionistic Realizability Validating Markov's Principle
Talk at the workshop: Classical Logic and Computation, Vienna, July 13, 2014.
- F. Aschieri
A Hypotheses-Based Analysis of proof-theoretic Validity
Talk at the Conference: Hypotheses, IHPST Paris, May 30, 2014.
- F. Aschieri
Exceptions and Learning in Classical Curry-Howard Correspondence
Invited seminar, Vienna University of Technology, March 12, 2014.
- F. Aschieri
Realizability and learning in Classical Arithmetic
Invited speaker at the workshop: Recent Advancements in Type Theory, MSC Lyon, January 13, 2014.
- F. Aschieri
Realizability and Strong Normalization for Heyting Arithmetic with EM1
Talk at the Conference: CSL 2013, Torino, September 2, 2013.
- F. Aschieri
Non-Determinism, Non-Termination and the Strong Normalization of System T
Talk at the Conference: TLCA 2013, Eindhoven, June 27, 2013.

- F. Aschieri
Strong Normalization HA + EM1 by Non-Deterministic Choice
Talk at the Conference: COS 2013, Eindhoven, June 25, 2013.
- F. Aschieri
Strong Normalization for Intuitionistic Arithmetic with 1-Excluded Middle
Talk at the Conference: Types 2013, Toulouse, April 24, 2013.
- F. Aschieri
Interactive Realizability and Classical Forcing
Invited seminar: Université Paris VII, PPS, February 28, 2013.
- F. Aschieri
Mathematical Proofs as Learning Programs
Talk at “journée des nouveaux entrants”: ENS de Lyon, 28 January, 2013.
- F. Aschieri
Interactive Realizability for Classical Peano Arithmetic with Skolem Axioms
Talk at the Workshop: Collegium Logicum, Paris, November 16, 2012.
- F. Aschieri
Eliminating Skolem Functions in Peano Arithmetic with Interactive Realizability
Talk at the Conference: Classical Logic and Computation 2012, Warwick, July 8, 2012.
- F. Aschieri
Interactive Realizability for Classical Peano Arithmetic with Skolem Axioms
Talk at the Conference: Computer Science Logic 2012, Fontainebleau, September 4, 2012.
- F. Aschieri
Interactive Realizability for Classical Peano Arithmetic with Skolem Axioms
Talk at the Workshop: Realisabilité à Chambéry, Chambéry, June 7, 2012.
- F. Aschieri
A New Way of Using Friedman’s Translation: Interactive Realizability
Seminar, INRIA-Paris, 19 October, 2011.
- F. Aschieri
Transfinite Update Procedures for Predicative Systems of Analysis
Talk at the Conference: Computer Science Logic 2011, Bergen, September 15, 2011.
- F. Aschieri
Learning-Based Classical Realizability for Heyting Arithmetic with EM1 and SK1
Invited seminar, Università di Padova, July 13, 2011.
- F. Aschieri
Learning-Based Classical Realizability for Second-Order Intuitionistic Arithmetic with EM1 and SK1
Talk at the Workshop: Realisabilité à Chambéry, Chambéry, June 16, 2011.
- F. Aschieri
Realizability, Epsilon Substitution Method and Type Theory
Invited seminar, Kurt Gödel Research Center, Vienna, April 27, 2011.

- F. Aschieri *Classical Logic, Learning and Realizability*
Invited seminar, ENS de Lyon, Lyon, March 24, 2011.
- F. Aschieri
Interactive Learning Based Realizability and 1-Backtracking Games
Talk at the Conference: Classical Logic and Computation 2010, Brno, August 22, 2010.
- F. Aschieri
Learning Based Realizability
Talk at the Workshop: Realisabilité a Chambéry 2010, Chambéry, June 1, 2010.
- F. Aschieri
A Realizability Interpretation for Heyting Arithmetic with Excluded Middle over Sigma-0-1 formulas
Talk at the Conference: Typed Lambda Calculi and Applications 2009, Brazilia, July 2, 2009.