Thomas Powell

Department of Computer Science
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Date of birth: 11 November, 1986
Nationality: British
Languages: English (native), German (fluent), Welsh (fluent)

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Research area

Proof theory • Computability theory • Program semantics

Current position

May 20 - *Lecturer (Assistant Professor)*
Department of Computer Science, University of Bath

Past positions

Oct 16 - Apr 20 *Postdoctoral Researcher*
Department of Mathematics, Technische Universität Darmstadt

Oct 14 - Sep 16 *Postdoctoral Researcher*
Institute of Computer Science, University of Innsbruck

Oct 13 - Sep 14 *CARMIN Postdoctoral Research Fellow*
Institute des Hautes Études Scientifiques (combined visit at Institut Henri Poincaré)

Education

Oct 09 - May 13 *PhD in Theoretical Computer Science*
Queen Mary University of London

Oct 08 - Jun 09 *Certificate of Advanced Study in Mathematics (Part III)*
University of Cambridge

Oct 05 - Jun 08 *BA in Mathematics*
University of Cambridge

Papers

Preprints (submitted)

preprint Thomas Powell, Peter Schuster and Franziskus Wiesnet. *A universal algorithm for Krull's theorem*

preprint Thomas Powell. *A unifying framework for continuity and complexity in higher types*

preprint Thomas Powell. *Sequential algorithms and the computational content of classical proofs*

Publications (peer reviewed)

accepted Thomas Powell. *A note on the finitization of Abelian and Tauberian theorems*
to appear in **Mathematical Logic Quarterly**.

accepted Thomas Powell. *A computational interpretation of Zorn's lemma*
to appear in **Proceedings of Logic in Computer Science (LICS '20)**.

accepted Ulrich Kohlenbach and Thomas Powell. *Rates of convergence for iterative solutions of equations involving set-valued accretive operators*
to appear in **Computers and Mathematics with Applications**

2020 Thomas Powell. *Dependent choice as a termination principle*
Archive for Mathematical Logic, 59(3–4): 503–516.

2020 Thomas Powell. *Well quasi-orders and the functional interpretation*
Chapter in **Well Quasi-Orders in Computational Logic, Language and Reasoning**, Trends in Logic 53: 221–269, Springer.

2019 Thomas Powell. *A proof theoretic study of abstract termination principles*
Journal of Logic and Computation 29(8): 1345–1366.

2019 Thomas Powell. *Computational interpretations of classical reasoning: From the epsilon calculus to stateful programs*
Chapter in **Mathesis Universalis, Computability and Proof**, Synthese Library 412: 255–290, Springer.

2019 Thomas Powell. *A new metastable convergence criterion and an application in the theory of uniformly convex Banach spaces*
Journal of Mathematical Analysis and Applications 478(2): 790–805.

2019 Thomas Powell. *Parametrised bar recursion: A unifying framework for realizability interpretations of classical dependent choice*
Journal of Logic and Computation 29(4): 519–554.

2019 Thomas Powell, Peter Schuster and Franziskus Wiesnet. *An algorithmic approach to the existence of ideal objects in commutative algebra*
Proceedings of Workshop on Logic, Language, Information, and Computation (WoLLIC '19), LNCS 11541: 533–549.

2018 Thomas Powell. *A functional interpretation with state*
Proceedings of Logic in Computer Science (LICS '18) pp. 839–848, ACM.

2017 Paulo Oliva and Thomas Powell. *Bar recursion over finite partial functions*
Annals of Pure and Applied Logic 168(5): 887–921.

2016 Thomas Powell. *Gödel's functional interpretation and the concept of learning*
Proceedings of Logic in Computer Science (LICS '16) pp. 136–145, ACM.

2015 Georg Moser and Thomas Powell. *On the computational content of termination proofs*

Proceedings of Computability in Europe (CiE '15), LNCS 9136: 276–285.

2015 Paulo Oliva and Thomas Powell. *A game-theoretic computational interpretation of proofs in classical analysis*
Chapter in **Gentzen's Centenary: The Quest for Consistency** pp. 501–531, Springer.

2015 Paulo Oliva and Thomas Powell. *A constructive interpretation of Ramsey's theorem via the product of selection functions*
Mathematical Structures in Computer Science 25(8): 1755–1778.

2014 Thomas Powell. *The equivalence of bar recursion and open recursion*
Annals of Pure and Applied Logic 165(11): 1727–1754.

2012 Thomas Powell. *Applying Gödel's Dialectica interpretation to obtain a constructive proof of Higman's lemma*
Proceedings of Classical Logic and Computation (CL+C '12), EPTCS 97: 49–62.

2012 Paulo Oliva and Thomas Powell. *On Spector's bar recursion*
Mathematical Logic Quarterly 58(4-5): 356–365.

2011 Martín Escardó, Paulo Oliva and Thomas Powell. *System T and the product of selection functions*
Proceedings of Computer Science Logic (CSL '11), LIPIcs 12: 233–247.

PhD thesis

2013 Thomas Powell. *On Bar Recursive Interpretations of Analysis*
Supervised by Paulo Oliva and Edmund Robinson
Queen Mary University of London, xii+174pp.

Selected invited talks

16/08/19 Logic Colloquium: Special Session on Proof Theory and Proof Complexity, Prague.
05/11/17 Oberwolfach Workshop on Mathematical Logic: Proof Theory, Constructive Mathematics, MFO.
25/07/17 Humboldt-Kolleg: Proof Theory as Mathesis Universalis, Villa Vigoni, Como.
22/01/16 Dagstuhl Seminar 16031: Well Quasi-Orders in Computer Science, Schloss Dagstuhl.
15/09/15 Continuity, Computability, Constructivity (CCC '15), Kochel.

Conference and seminar talks

12/12/19 Logik-Arbeitstagung Bern, München und Verona, LMU Munich.
20/03/19 Computer Science Seminar, University of Verona.
12/07/18 Logic in Computer Science (LICS '18), University of Oxford.
05/07/18 Workshop on Proofs and Computation, Hausdorff Research Institute for Mathematics, Bonn.
13/04/18 Workshop on Computational Approaches to the Foundations of Mathematics, LMU Munich.
14/09/17 Minisymposium on Applied Proof Theory and the Computational Content of Mathematics, Joint ÖMG and DMV Congress, Salzburg.
12/07/17 Mathematical Logic Seminar, LMU Munich.
27/10/16 Logic Research Seminar, University of Bern.
05/09/16 Logic, Complexity and Automation, part of CLA 2016, Obergurgl.
05/07/16 Logic in Computer Science (LICS '16), Columbia University.
23/06/16 Classical Logic and Computation (CL&C '16), Porto.
12/05/16 Mathematics for Computation, Niederalteich.
06/05/16 Proof, Computation, Complexity (PCC '16) LMU Munich.

16/12/15 Workshop on Efficient and Natural Proof Systems, University of Bath.
04/11/15 Mathematical Logic Seminar, LMU Munich.
02/07/15 Computability in Europe (CiE '15), Bucharest.
11/06/15 Epsilon 2015, University of Montpellier.
04/12/14 Proof, Complexity and Verification Seminar, Swansea University.
12/07/14 Second Workshop on the Two Faces of Complexity, part of Vienna Summer of Logic.
14/01/14 Séminaire de Mathématiques, Institut des Hautes Études Scientifiques.
09/01/14 PLUME Seminar, ENS Lyon.
18/12/13 Proof, Complexity and Verification Seminar, Swansea University.
12/11/13 Semantics Seminar, PPS lab, Université Paris Diderot.
08/07/13 Classical Logic and Computation (CL&C '12), University of Warwick.
03/07/13 Theoretical Computer Science Seminar, University of Birmingham.
12/09/11 Computer Science Logic (CSL '11), Bergen.

Supervision

ongoing Franziskus Wiesnet, PhD thesis, University of Trento (main supervisor: Peter Schuster).
2018 Mireia González Bedmar. Master's thesis: *On a game-theoretic semantics for the Dialectica interpretation of analysis*, University of Barcelona (main supervisor: Joost Joosten).
2016 Philipp Wirtenberger. Bachelor project: *Analysing the Complexity of Monotone Prolog*, University of Innsbruck (co-supervised with Georg Moser).

Academic grants

2020 (declined) (€186,167.04) Marie Skłodowska-Curie Individual Fellowship, to be carried out at TU Vienna with Agata Ciabattoni (passed evaluation phase but declined offer due to taking up lectureship at Bath)
2013 One of two postdoctoral fellowships of the CARMIN programme.
2009 EPSRC Doctoral Training Grant (full PhD funding for 3.5 years).

Academic service

Organisation

2017 Minisymposium on Applied Proof Theory and the Computational Content of Mathematics (co-organised with Sam Sanders), part of the joint annual conference of the Austrian Mathematical Society (ÖMG) and German Mathematical Society (DMV), Salzburg.
2016 Workshop on Logic, Complexity and Automation (co-organised with Georg Moser), part of Computational Logic in the Alps, Obergurgl.

Refereeing

Annals of Pure and Applied Logic • Archive for Mathematical Logic • CSR • FSCD • LICS • Logic Journal of the IGPL • MFCS • Notre Dame Journal of Formal Logic • RTA • TYPES • Theoretical Computer Science

Teaching

Lecturer

summer 19

Higher order computability theory. Master level course, TU Darmstadt.

Mar 19 Proof interpretations: A modern perspective. Short lecture course, University of Verona.

Sep 18 Proof mining. Autumn School on Proof and Computation, Fischbachau.

Aug 18 Introduction to proof theory (co-lectured with Anupam Das). ESSLLI, Sofia University.

Jun 18 Proof interpretations: A modern perspective (co-lectured with Anupam Das). NASSLLI, Carnegie Mellon University.

Teaching assistant (TU Darmstadt)

Responsibilities include: Leading exercises classes and tutorials, designing problem sheets, general organisation (including examinations). Undergraduate level indicated.

Analysis I *&* II (1st year)
Linear Algebra I *&* II (1st year)
Automaten, formale Sprachen und Entscheidbarkeit (1st year)

Undergraduate tutorials (Queen Mary University of London)

Introduction to Algebra (1st year)
Introduction to Probability (1st year)
Geometry I (1st year)
Probability Models (2nd year)
Convergence and Continuity (2nd year)
Number Theory (3rd year)