

Anupam Das

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Date of birth: 17th November, 1987.
Nationality: British.
Languages: English (native), French (fluent).

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Career

- 09/17 - present Marie Skłodowska-Curie fellow. DIKU, University of Copenhagen, Denmark.
- 10/14 - 08/17 Postdoctoral researcher. LIP, École Normale Supérieure de Lyon, France.
- 11/13 - 09/14 Inria postdoctoral fellow. LIX, École Polytechnique, France.
- 10/10 - 10/13 PhD in Computer Science. University of Bath, UK.
- 10/06 - 08/10 Bachelor's and Master's studies in Mathematics. University of Oxford, UK.

Papers

- 03/19 A Functional (Monadic) Second-Order Theory of Infinite Trees. Anupam Das and Colin Riba. Submitted.
<https://arxiv.org/abs/1903.05878>
This is an extended version of the *LICS 2015* paper.
- 02/19 On the logical complexity of cyclic arithmetic. Anupam Das. Accepted to journal *Logical Methods in Computer Science*.
<https://arxiv.org/abs/1807.10248>
- 23/10/18 Left-handed completeness for Kleene Algebra, via cyclic proofs. Anupam Das, Amina Doumane & Damien Pous. Proceedings of *LPAR 2018*.
<https://doi.org/10.29007/hzq3>
- 29/08/18 A recursion-theoretic characterisation of the positive polynomial-time functions. Anupam Das & Isabel Oitavem. Proceedings of *CSL 2018*.
<https://doi.org/10.4230/LIPIcs.CSL.2018.18>
Invited to a special journal issue of selected papers from *CSL 2018* and *LICS 2016*.
- 29/08/18 Non-wellfounded proof theory for (Kleene + action)(algebras + lattices). Anupam Das & Damien Pous. Proceedings of *CSL 2018*.
<https://doi.org/10.4230/LIPIcs.CSL.2018.19>
- 30/06/18 Focussing, MALL and the polynomial hierarchy. Anupam Das. Proceedings of *IJCAR 2018*.
https://doi.org/10.1007/978-3-319-94205-6_45
Invited to a special journal issue of selected papers from *IJCAR 2018*.
- 30/08/17 A cut-free cyclic proof system for Kleene Algebra. Anupam Das & Damien Pous. Proceedings

of *Tableaux 2017*.

https://doi.org/10.1007/978-3-319-66902-1_16

- 07/17 Alternating time bounds from variants of focussed proof systems. Anupam Das. In revision.
<http://anupamdas.com/alt-time-bnds-var-foc-sys.pdf>
- 28/12/16 On linear rewriting systems for Boolean logic and some applications to proof theory. Anupam Das & Lutz Straßburger. *Journal Logical Methods in Computer Science* special issue *Selected papers of RTA and TLCA 2015*.
[http://dx.doi.org/10.2168/LMCS-12\(4:9\)2016](http://dx.doi.org/10.2168/LMCS-12(4:9)2016)
- 25/08/16 Free-cut elimination in linear logic and an application to a feasible arithmetic. Patrick Baillot & Anupam Das. *Proceedings of CSL 2016*.
<http://dx.doi.org/10.4230/LIPIcs.CSL.2016.40>
- 05/07/16 From positive and intuitionistic bounded arithmetic to monotone proof complexity. Anupam Das. *Proceedings of LICS 2016*.
<http://doi.org/10.1145/2933575.2934570>
- 03/09/15 On nested sequents for constructive modal logics. Ryuta Arisaka, Anupam Das & Lutz Straßburger. *Journal Logical Methods in Computer Science*.
[http://dx.doi.org/10.2168/LMCS-11\(3:7\)2015](http://dx.doi.org/10.2168/LMCS-11(3:7)2015)
- 06/07/15 A complete axiomatization of MSO on infinite trees. Anupam Das & Colin Riba. *Proceedings of LICS 2015*.
<http://dx.doi.org/10.1109/LICS.2015.44>
- Invited to a special journal issue of selected papers from *LICS 2015* and *LICS 2016*.
- 29/06/15 No complete linear term rewriting system for propositional logic. Anupam Das & Lutz Straßburger. *Proceedings of RTA 2015*.
<http://dx.doi.org/10.4230/LIPIcs.RTA.2015.127>
- 06/03/15 On the relative proof complexity of deep inference via atomic flows. Anupam Das. *Journal Logical Methods in Computer Science* special issue *Selected papers of the Turing Centenary Conference: CiE 2012*.
[http://dx.doi.org/10.2168/LMCS-11\(1:4\)2015](http://dx.doi.org/10.2168/LMCS-11(1:4)2015)
- 14/07/14 On the pigeonhole and related principles in deep inference and monotone systems. Anupam Das. *Proceedings of CSL-LICS 2014*.
<http://doi.org/10.1145/2603088.2603164>
- 24/06/13 Rewriting with linear inferences in propositional logic. Anupam Das. *Proceedings of RTA 2013*.
<http://dx.doi.org/10.4230/LIPIcs.RTA.2013.158>
- 18/06/12 Complexity of deep inference via atomic flows. Anupam Das. *Proceedings of Turing Centenary Conference: CiE 2012*.
http://dx.doi.org/10.1007/978-3-642-30870-3_15
- 04/07/11 On the proof complexity of cut-free bounded deep inference. Anupam Das. *Proceedings of Tableaux 2011*.
http://dx.doi.org/10.1007/978-3-642-22119-4_12

Selected invited talks

- 19/07/18 Cyclic proofs, hypersequents and Kleene algebra. Invited talk at *Workshop on External and*

Internal Calculi for Non-Classical Logics, Oxford.

<http://weic2018.loria.fr/>

07/07/18 Proof complexity of deep inference: a survey. Invited talk at *Twenty Years of Deep Inference*, Oxford.

<https://www.lix.polytechnique.fr/~lutz/orgs/TYDI2018.html>

14/04/18 Monotonicity in Logic and Complexity. Invited talk at *DICE 2018*.

<http://cl-informatik.uibk.ac.at/users/zini/events/dice18/>

02/09/16 Proof complexity of deep inference: a survey. Invited talk at *LCC 2016*, Marseille.

<http://lcc2016.cs.unibo.it/>

05/02/15 Theories of bounded arithmetic for deep inference proof systems. Invited talk at *CHoCoLa séminaire*, Lyon.

<http://chocola.ens-lyon.fr/events/seminaire-2015-02-05/>

PhD thesis

20/10/14 The complexity of propositional proofs in deep inference. Defended on 18th October 2013, University of Bath. Supervised by Alessio Guglielmi and John Power.

<http://www.anupamdas.com/Thesis-AnupamDas.pdf>

Supervision

02/19 - present Tim Waring. Proof theoretic extensions of graph-based models for Boolean logic (*tentative title*). Master's thesis project, University of Copenhagen.

06/16 - 08/16 Cameron Calk. A graph theoretic extension of Boolean logic. Undergraduate internship, ENS Lyon. Co-supervised by Olivier Laurent.

Internship report: <http://www.anupamdas.com/graph-bool.pdf>

07/12 - 09/12 Alvin Šipraga. An automated search of linear inference rules. Undergraduate internship, University of Bath. Co-supervised by Alessio Guglielmi.

Internship report: <http://arcturus.su/mimir/autolininf.pdf>

Source code: <http://github.com/blahblahson/mimir/>

Notable grants

09/17 - 08/19 (200,194.80 €) Marie Skłodowska-Curie fellowship for project *Monotonicity in Logic and Complexity*. European Commission project 753431. Call H2020-MSCA-IF-2016, mathematics panel.

Teaching (graduate and post-graduate level)

12/18 Lecturer for the course *Introduction to proof theory*. *Logic Summer School 2018*, Canberra.

13-17/08/18 Lecturer for the course *Introduction to proof theory*. Co-lectured by Thomas Powell. *ESSLLI 2018*, Sofia.

25-29/06/18 Lecturer for the course *Proof interpretations: a modern perspective*. Co-lectured by Thomas Powell. *NASSLLI 2018*, Pittsburgh.

25/09/17 Lecturer for the tutorial *From proof systems to complexity bounds*, co-located with *Tableaux 2017*,

FroCoS 2017, and *ITP 2017*, Brasília.

<http://www.anupamdass.com/wp/from-proof-systems-to-complexity-bounds/>

- 03 - 14/08/15 Lecturer for the course *Normalisation and Deep Inference*. Co-lectured by Alessio Guglielmi. *ESSLLI 2015*, Barcelona.
<http://www.cs.bath.ac.uk/ag/ESSLLI/>

Teaching (undergraduate and master's level)

- 04/19 - 06/19 Lecturer for the course *Introduction to Mathematical Logic*. Mathematics Master's, University of Copenhagen. Co-lectured by Asger Törnquist.
- 03/19 Guest lecturer for the course *Computability and Complexity*. Computer Science Master's, University of Copenhagen.
- 09-12/18 Lecturer for *Grundlæggende Datalogi* (basic computer science). Co-lectured by Jakob Simonsen and Anders Søgaard. Humanities years 1 - 2, University of Copenhagen.
- 06/18 Guest lecturer for *Introduction to Mathematical Logic*. Mathematics Master's, University of Copenhagen.
- 01/17 - 05/17 Laboratory tutor for *Introduction aux Réseaux et au Web* (introduction to networks and the web). Informatique year 1, Université Claude Bernard Lyon 1.
- 01/16 - 05/16 Classroom tutor and course assistant for *Logique Mathématique* (mathematical logic). Informatique year 3, ENS Lyon.
- 09/15 - 01/16 Classroom and laboratory tutor and course assistant for *Théorie de la Programmation* (theory of programming). Informatique year 3, ENS Lyon.
- 02/13 - 05/13 Classroom tutor for *Algebra 2B*. Mathematics year 2, University of Bath.
- 10/12 - 01/13 Laboratory tutor for *Programming and Discrete Mathematics*. Mathematics year 1, University of Bath.
- 02/12 - 05/12 Laboratory tutor for *Analytical Mathematics for Applications*. Computer Science year 1, University of Bath.
- 02/11 - 05/11 Classroom tutor for *Algebra 2B*. Mathematics year 2, University of Bath.

Professional service

- 20-22/11/19 Programme committee member for *Circularity in Syntax and Semantics*, Gothenburg.
<http://www.cse.chalmers.se/~bahafs/CiSS2019/>
- 03-05/09/19 Programme committee member for *28th International Conference on Automated Reasoning with Analytic Tableaux and Related Methods*, London.
<https://tableaux2019.org/>
- 08/07/19 Programme committee member for *20th International Workshop on Logic and Computational Complexity*, to be co-located with *ICALP '19*, Patras.
<http://www.cs.swansea.ac.uk/lcc/>
- 29-30/06/19 Chair of the *5th Workshop on Structures and Deduction*, to be co-located with *FSCD '19*, Dortmund.
<http://www.anupamdass.com/sd19>
- 17-21/06/19 Organiser of *Caleidoscope* school. Co-organised by Damiano Mazza and Thomas Seiller.

- 08-09/09/17 Chair of the 4th *Workshop on Structures and Deduction*, co-located with *FSCD '17*, Oxford. Co-chaired by Kaustuv Chaudhuri & Willem Heijltjes.
<http://www.anupamdas.com/sd17>
- 18/06/17 Chair of the 2nd *Logic Mentoring Workshop*, co-located with *LICS '17*, Reykjavík. Co-chaired by Valeria Vignudelli & Fabio Zanasi.
<http://lics.rwth-aachen.de/lics17/lmw.html>
- 07-10/11/16 Organising committee member of *Linear Logic: interaction, proofs and computation*, Lyon.
<http://l12016.sciencesconf.org/>
- 14 - 16/12/15 Organiser of the *Workshop on Efficient and Natural Proof Systems*, Bath. Co-organised by Paola Bruscoli, Willem Heijltjes & Lutz Straßburger.
<http://www.cs.bath.ac.uk/ag/ENPS/wenps2015.html>
- 11-12/04/15 Program committee member of *DICE 2015*, Queen Mary University, London.
<http://dice15.computing.dundee.ac.uk/>
- 23/05/12 Organiser of the 14th *Wessex Theory Seminar*, University of Bath.
<https://wiki.bath.ac.uk/display/wessex/14th+Wessex+Theory+Seminar>

Other appointments

- 07-08/18 Participant of the *Types, Sets and Constructions* trimester, Hausdorff Research Institute for Mathematics, Bonn.
- 10/16 - 12/16 Visting Scholar at Department of Mathematics, UC Berkeley, California.
 Participant of *Logical Structures in Computation* program, Simons Institute.
- 04/14 - 07/14 Participant of Trimester in *Semantics of proofs and certified mathematics*. Institut Henri Poincaré, Paris.
- 09/11 - 12/11 Participant of *MALOA Special Semester in Logic and Complexity*. Charles University, Prague.

Recent outreach events

- 08/06/18 *DIKU Bits* speaker. Popular science lecture to Undergraduates, Copenhagen.
- 26/10/17 Introduction to theoretical computer science, speaker, and guided tour of DIKU. High School students, Copenhagen.
- 17/05/17 *Pint of Science* speaker. Popular science event for local community, Lyon.
- 11/16 - 12/16 Instructor at *Berkeley Math Circle: Intermediate II*. High School students, California.

Workshops and conferences without published proceedings

- 13/07/18 A recursion-theoretic characterisation of the positive polynomial-time functions. Anupam Das & Isabel Oitavem. *LCC 2018*, Oxford.
- 08/07/18 On the logical complexity of cyclic arithmetic. Anupam Das. *Programming and Reasoning on Infinite Structures*, Oxford.
- 08/07/18 Towards theories for positive polynomial time and monotone proofs with extension. Anupam Das. *Proof Complexity 2018*, Oxford.
- 07/07/18 Some ideas on cut-elimination for cyclic arithmetic proofs. Anupam Das. *Classical Logic & Computation 2018*, Oxford.

- 12/06/18 On the logical complexity of cyclic arithmetic. Anupam Das. *10th Scandinavian Logic Symposium*, Gothenburg.
- 12/12/17 On the logical complexity of cyclic proofs in arithmetic. Anupam Das. *Logical Structures in Computation Reunion Workshop*, Berkeley.
- 03/11/17 Some theories of bounded arithmetic for monotone complexity. Anupam Das. *Prague Workshop on Bounded Arithmetic*, Prague.
- 19/06/17 An implicit characterisation of the polynomial hierarchy in an unbounded arithmetic. Patrick Baillot & Anupam Das. *LCC 2017*, Reykjavík.
- 15/12/16 From focussed proof systems to complexity bounds. Anupam Das. *DaleFest*, seminar in honour of the 60th birthday of Dale Miller, Paris.
- 02/08/16 Intuitionistic bounded arithmetic and monotone proof complexity. Anupam Das. *Logic Colloquium 2016*, Leeds.
- 03/04/16 Towards feasibility in arithmetic via linear logic. Patrick Baillot & Anupam Das. *DICE 2016*, Eindhoven.
- 05/07/15 Bounded arithmetic for monotone and deep inference systems. Anupam Das. *LCC 2015*, Kyoto.
- 13/07/14 $n^{O(\log \log n)}$ -size monotone proofs of the weak pigeonhole principle. Anupam Das. *Proof Complexity 2014*, Vienna.
- 15/05/14 Towards a bounded arithmetic for analytic deep inference. Anupam Das. *PCC 2014*, Paris.
- 06/11/13 Some ideas on bounded arithmetics for systems of monotone proofs. Anupam Das. *LIX Colloquium 2013*, Paris.
- 17/08/12 Combinatorial principles in deep inference. Anupam Das. *PCC 2012*, Copenhagen.
- 24/11/11 On proof compression mechanisms and deep inference. Anupam Das. *LAC-GeoCal 2011*, Paris.