

Work experience

- 2024–present **Fellow by Examination (JRF)**, Magdalen College, University of Oxford, UK.
Subject: Computer Science
- 2023–2024 **Postdoctoral Researcher**, Saarland University, Germany.
Department of Mathematics, advisor: Laurent Bartholdi
- 2021/2020 **Research Intern**, Laboratoire Informatique de l'Ecole Polytechnique, France.

Education

- 2021–2023 **DPhil, Computer Science**, University of Oxford, UK.
– Thesis title: *Algorithmic Problems for Subsemigroups of Infinite Groups*.
– Supervisors: Christoph Haase, James Worrell.
- 2020–2021 **MSc, Parisian Master of Research in Computer Science MPRI**, Université de Paris, France.
- 2017–2021 **Diplôme d'Ingénieur**, Ecole Polytechnique, France.
- 2014–2018 **BSc, Mathematics**, Peking University, China.

Awards and Honours

- EATCS Distinguished Dissertation Award 2023.**
- Kleene Award for the Best Student Paper**, LICS 2023.
- Best Student Paper Award (Track B)**, ICALP 2023.

Publications and Preprints

Preprints

Ruiwen Dong. Submonoid Membership in n -dimensional lamplighter groups and S-unit equations. *arXiv preprint arXiv:2409.07077*, 2024.

Corentin Bodart and Ruiwen Dong. The Identity Problem in virtually solvable matrix groups over algebraic numbers. *arXiv preprint arXiv:2404.02264*, 2024.

Peer-reviewed articles

Ruiwen Dong. Linear equations with monomial constraints and decision problems in abelian-by-cyclic groups. In *36th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2025. To appear.

Laurent Bartholdi, Ruiwen Dong, Leon Pernak, and Jan Philipp Wächter. Equations in wreath products. *Semigroup Forum*, 2024. Invited paper, to appear.

Ruiwen Dong. Semigroup algorithmic problems in metabelian groups. In *56th Annual ACM Symposium on Theory of Computing (STOC)*, 2024.

Ruiwen Dong. The Identity Problem in nilpotent groups of bounded class. In *35th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA)*, 2024.

Ruiwen Dong, Stephen Melczer, and Marc Mezzarobba. Computing error bounds for asymptotic expansions of regular P-recursive sequences. *Mathematics of Computation*, 2024.

Ruiwen Dong. Recent advances in algorithmic problems for semigroups. *ACM SIGLOG News*, 2023. Invited paper.

Ruiwen Dong. Termination of linear loops under commutative updates. In *Proceedings of the 2023 International Symposium on Symbolic and Algebraic Computation (ISSAC)*, 2023.

Ruiwen Dong. The Identity Problem in $\mathbb{Z} \wr \mathbb{Z}$ Is Decidable. In *50th International Colloquium on Automata, Languages, and Programming (ICALP)*, 2023. **Best Student Paper Award for Track B**.

Ruiwen Dong. The Identity Problem in the special affine group of \mathbb{Z}^2 . In *38th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*, 2023. **Kleene Award for the Best Student Paper**.

Ruiwen Dong, Christian Goodbrake, Heather A. Harrington, and Gleb Pogudin. Differential elimination for dynamical models via projections with applications to structural identifiability. *SIAM Journal on Applied Algebra and Geometry*, 2023.

Ruiwen Dong. Solving homogeneous linear equations over polynomial semirings. In *40th International Symposium on Theoretical Aspects of Computer Science (STACS)*, 2023.

Ruiwen Dong. Semigroup intersection problems in the Heisenberg Groups. In *40th International Symposium on Theoretical Aspects of Computer Science (STACS)*, 2023. Journal version: *SIAM J. Discret. Math.*

Ruiwen Dong. On the Identity Problem for unitriangular matrices of dimension four. In *47th International Symposium on Mathematical Foundations of Computer Science (MFCS)*, 2022.

Conference and seminar talks

- = conference contributions ○ = seminar and workshop talks

Semigroup algorithmic problems in metabelian groups, short version.

- STOC 2024, Vancouver, Canada June 2024

Decision problems in sub-semigroups of metabelian groups, long version.

- Séminaire “Groupes et Géométrie”, University of Geneva, Switzerland March 2024
○ Group theory seminar, Ecole Normale Supérieure, France November 2023
○ AG1 Mittagssseminar, MPI for Informatics, Germany June 2023
○ Logic Advanced Class, Mathematical Institute, University of Oxford, UK May 2023

The Identity Problem in nilpotent groups of bounded class, short version.

- SODA 2024, Alexandria, USA January 2024

On the Identity Problem for unipotent matrix groups of nilpotency class at most ten, long version.

- Verification series seminar, University of Liverpool, UK May 2022

Decidability problems in infinite semigroups.

- Automata theory seminar, University of Warsaw, Poland November 2023
○ Algorithmic Aspects of Dynamical Systems, Bellairs Research Institute, Barbados May 2023

Termination of linear loops under commutative updates.

- ISSAC 2023, Tromsø, Norway July 2023

The Identity Problem in $\mathbb{Z} \wr \mathbb{Z}$ is decidable.

- ICALP 2023, Paderborn, Germany July 2023

The Identity Problem in the special affine group of \mathbb{Z}^2 .

- LICS 2023, Boston, USA June 2023

Semigroup intersection problems in the Heisenberg Groups.

- STACS 2023, Hamburg, Germany March 2023

Solving homogeneous linear equations over polynomial semirings.

- STACS 2023, Hamburg, Germany

March 2023

On the Identity Problem for unitriangular matrices of dimension four.

- RP 2022, MPI-SWS Kaiserslautern, Germany
- OFCOURSE series, MPI-SWS Kaiserslautern, Germany
- MFCS 2022, Vienna, Austria
- IRIF verification seminar, Paris, France

October 2022

October 2022

August 2022

March 2022

A new algorithm for finding the input-output equations of differential models.

- MAX team seminar, Ecole Polytechnique, France

October 2020

Reviewing work

Conferences: SODA, ICALP, LICS, STACS, MFCS. Journals: SICOMP, Inf. Comput., TACON

Languages

Chinese Native, C2

English Fluent, C2

French Fluent, C2

Russian Proficient, C1

Polish Proficient, C1

German Intermediate, B2

Turkish Intermediate, B1

Programming languages and software

Python, Julia, C, C++, Java, R, Sage