

Education

- 2021–2023 **DPhil (PhD), Computer Science, University of Oxford, UK.**
(Expected) – Research title: Algorithmic problems in infinite semigroups.
– Supervisors: Christoph Haase, James Worrell.
- 2020–2021 **MSc (M2), Parisian Master of Research in Computer Science (MPRI), Université de Paris, France.**
– Master's thesis: *Computing Error Bounds for Asymptotic Expansions of Regular P-Recursive Sequences.*
- 2017–2021 **Diplôme d'Ingénieur, Ecole Polytechnique, France.**
– Dissertation: *Computing input-output projections of dynamical models with applications to structural identifiability.*
- 2014–2018 **BSc, Mathematics, Peking University, China.**
– Bachelor's thesis: *The Tensor Product Standard Type Calculation Optimized by Graph Isomorphism Algorithm.*

Awards and Honours

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

Publications and Preprints

Preprints

- 2023 Ruiwen Dong. Semigroup algorithmic problems in metabelian groups. 2023. <https://arxiv.org/abs/2304.12893>.
- 2022 Ruiwen Dong, Stephen Melczer, and Marc Mezzarobba. Computing error bounds for asymptotic expansions of regular P-recursive sequences. 2022. <https://arxiv.org/abs/2212.11742>.
- 2022 Ruiwen Dong. On the Identity Problem and the Group Problem in nilpotent groups. 2022. <https://arxiv.org/abs/2208.02164>.

Peer-reviewed articles

- 2023 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*, volume 7, pages 194–235. SIAM, 2023.
- 2023 Ruiwen Dong. Termination of linear loops under commutative updates. 2023. To appear in 48th International Symposium on Symbolic and Algebraic Computation, ISSAC. <https://doi.org/10.48550/arXiv.2302.01003>.
- 2023 Ruiwen Dong. Solving homogeneous linear equations over polynomial semirings. In *40th International Symposium on Theoretical Aspects of Computer Science, STACS*, volume 254 of *LIPIcs*, pages 26:1–26:19, 2023.
- 2023 Ruiwen Dong. Semigroup intersection problems in the Heisenberg Groups. In *40th International Symposium on Theoretical Aspects of Computer Science, STACS*, volume 254 of *LIPIcs*, pages 25:1–25:18, 2023.

- 2023 Ruiwen Dong. The Identity Problem in the special affine group of \mathbb{Z}^2 . 2023. To appear in 38th ACM/IEEE Symposium on Logic in Computer Science, LICS. **Kleene Award for the Best Student Paper**. <https://arxiv.org/abs/2301.09502>.
- 2023 Ruiwen Dong. The Identity Problem in $\mathbb{Z} \wr \mathbb{Z}$ is decidable. 2023. To appear in 50th EATCS International Colloquium on Automata, Languages and Programming, ICALP. **Best Student Paper Award in Track B**. <https://doi.org/10.48550/arXiv.2302.05939>.
- 2022 Ruiwen Dong. On the Identity Problem for unitriangular matrices of dimension four. In *47th International Symposium on Mathematical Foundations of Computer Science, MFCS*, volume 241 of *LIPIcs*, pages 43:1–43:14, 2022.

Work experience

- March 2021, 6 months **Research Internship**, *Laboratoire Informatique de l'Ecole Polytechnique*, France.
Asymptotic expansions of P-Recursive sequences. Supervisors: Stephen Melzer, Marc Mezzarobba.
- March 2020, 6 months **Research Internship**, *Laboratoire Informatique de l'Ecole Polytechnique*, France.
Differential algebra and applications to structural identifiability. Supervisors: Gleb Pogudin, Heather Harrington.
- June 2019, 3 months **Industrial Internship**, *Phimeca Engineering*, France.
Application of statistical learning in simulations of atmospheric dispersion of pollutants.

Conference talks

- March 2023 **STACS 2022**, *Hamburg*, Germany.
Semigroup intersection problems in the Heisenberg Groups
- March 2023 **STACS 2022**, *Hamburg*, Germany.
Solving homogeneous linear equations over polynomial semirings
- October 2022 **RP 2022**, *MPI-SWS Kaiserslautern*, Germany.
On the Identity Problem for unitriangular matrices of dimension four
- August 2022 **MFCS 2022**, *Vienna*, Austria.
On the Identity Problem for unitriangular matrices of dimension four

Seminar and workshop talks

- May 2023 **Logic Advanced Class**, *Mathematical Institute, University of Oxford*, UK.
Decision problems in sub-semigroups of metabelian groups
- May 2023 **Algorithmic Aspects of Dynamical Systems**, *Bellairs Research Institute*, Barbados.
Decidability problems in infinite semigroups
- October 2022 **OFCOURSE series**, *MPI-SWS Kaiserslautern*, Germany.
The Identity Problem for unitriangular matrices of dimension four
- May 2022 **Verification series seminar**, *University of Liverpool*, UK.
On the Identity Problem for unipotent matrix groups of nilpotency class at most ten
- March 2022 **IRIF verification seminar**, *IRIF*, France.
The Identity Problem for unitriangular matrices of dimension four
- October 2020 **MAX team seminar**, *Ecole Polytechnique*, France.
A new algorithm for finding the input-output equations of differential models
- April 2019 **Centre de Mathématiques Appliquées**, *Ecole Polytechnique*, France.
A generalization of the preferential attachment model in graph theory

Reviewing work

ICALP 2022, SODA 2022, LICS 2023

Languages

Chinese Native, C2
French Fluent, C2
Polish Fluent, C1

English Fluent, C2
Russian Fluent, C1
Turkish Intermediate, B2

Programming languages and software

Python, Julia, C, C++, Java, R, MatLab, Sage, Git, LaTeX