

# Joris Nieuwveld

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Nationality: Dutch

Languages: Dutch and English

## PROFILE

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Currently, I am a Ph.D. candidate at the Max Planck Institute for Software Systems (MPI-SWS) in Saarbrücken, Germany. My supervisor is Joël Ouaknine, and I am in the Foundations of Algorithmic Verification group.

I am interested in problems within the intersection of arithmetic, algorithms and logic. In particular, I study problems in linear dynamical systems like the Skolem problem and Positivity problem and logics like Presburger arithmetic and monadic second-order logic combined with arithmetic in several bases simultaneously.

## EDUCATION

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**Max Planck Institute for Software Systems**      Saarland informatics campus, Saarbrücken, Germany  
Ph.D in computer science      2021–expected 2025

– Supervised by Prof. Joël Ouaknine.

**Radboud University**      Nijmegen, Netherlands  
M.Sc. in mathematics      2019–2021

– Thesis: “Fractions, Functions and Folding: A novel link between continued fractions, Mahler functions and paper folding” supervised by Prof. Wadim Zudilin. (ArXiv)

**Radboud University**      Nijmegen  
B.Sc. in mathematics      2016–2019

– Thesis: “Explicit constructions for semidirect products in Inverse Galois Theory” supervised by Dr. Bernd Souvignier. (pdf)

**Radboud University**      Nijmegen  
FNWI Honours Academy      2017–2019

**Stedelijk Gymnasium Nijmegen**      Nijmegen  
Secondary school      2010–2016

## WORK EXPERIENCE

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**smartfood R&D**      Zetten, Netherlands  
Assistant Mathematics and Statistics      2020-2021

– Predictive modeling of worst case initial infections of pathogenic microorganisms within food products

## PUBLICATIONS

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1. T. Karimov, F. Luca, J. Nieuwveld, J. Ouaknine, and J. Worrell, “On the decidability of Presburger arithmetic expanded with powers”, Proc. of SODA, 2025 (doi)
2. V. Berthé, T. Karimov, J. Nieuwveld, J. Ouaknine, M. Vahanwala, and J. Worrell, “The monadic theory of toric words”, Theoretical Computer Science 1025, 2025 (doi)
3. V. Berthé, T. Karimov, J. Nieuwveld, J. Ouaknine, M. Vahanwala, and J. Worrell, “On the decidability of monadic second-order logic with arithmetic predicates”, Proc. of LICS, 2024 (doi)
4. R. Aghamov, C. Baier, T. Karimov, J. Nieuwveld, J. Ouaknine, J. Piribauer, M. Vahanwala, “Model Checking Markov Chains as Distribution Transformers”, Principles of Verification: Cycling the Probabilistic Landscape, LNCS, volume 15261, 2024 (doi)
5. Y. Bilu, F. Luca, J. Nieuwveld, J. Ouaknine, and J. Worrell, “Twisted rational zeros of linear recurrence sequences”, Submitted, 2024 (ArXiv)
6. Y. Bilu, F. Luca, J. Nieuwveld, J. Ouaknine, and J. Worrell, “On the p-adic zeros of the Tribonacci sequence”, Mathematics of Computation 93(347), 2023 (doi)
7. G. Kenison, J. Nieuwveld, J. Ouaknine, and J. Worrell, “Positivity Problems for Reversible Linear Recurrence Sequences”, Proc. of ICALP, 2023 (doi)
8. T. Karimov, E. Kelmendi, J. Nieuwveld, J. Ouaknine and J. Worrell, “The Power of Positivity”, Proc. of LICS, 2023 (doi)
9. Y. Bilu, F. Luca, J. Nieuwveld, J. Ouaknine, D. Purser, and J. Worrell, “On the Skolem problem and the Skolem conjecture”, Proc. of LICS 2022 (doi)
10. R. Lipton, F. Luca, J. Nieuwveld, J. Ouaknine, D. Purser, and J. Worrell, “Skolem Meets Schanuel”, Proc. of MFCS, 2022 (doi). Webtool of implementation: <https://skolem.mpi-sws.org>

## TALKS

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1. Highlights 2024 and LICS 2024: On the Decidability of Monadic Second-Order Logic with Arithmetic Predicates
2. Kick off meeting of the ANR/FWF Project SYMDYNAR 2024: On Presburger arithmetic extended with multiple powers
3. Trends in Arithmetic Theories 2024: Logical theories combined with multiple powers
4. ICALP 2023 and RP 2023: Positivity Problems for Reversible Linear Recurrence Sequences
5. Lightning talk at MPI-SWS 2023: A gentle introduction to the Skolem Problem
6. Bellairs 2023: The Skolem Problem and rational zeros
7. MFCS 2022: Skolem Meets Schanuel
8. Highlights 2022: Progress on the Skolem Problem

## PROFESSIONAL SERVICE

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- **Teaching experience:** Peer-assisted learning (Radboud University, two semesters, teaching assistant), Mathematics for computer scientists I (Saarland University, 1 semester, teaching assistant)
- **Reviewer for:** STACS 2022, FoSSaCS 2023, ICALP 2024, INTEGERS: the Electronic Journal of Combinatorial Number Theory, Results in Mathematics