George Kenison

Institute of Logic and Computation – Technische Universität Wien

kenison.george@gmail.com • georgekenison.github.io

Research Experience

Research Interests: Decision Problems, Formal Verification, Program Analysis.

Institute of Logic and Computation, Technische Universität Wien
Postdoctoral Researcher in Automated Reasoning and Program Analysis. *May 2021–*

Department of Computer Science, University of Oxford
Postdoctoral Researcher in Infinite-State Systems and Dynamical Systems. *2018–2021*

Education

University of Warwick
PhD in Mathematics *2013–2017*
Thesis: Asymptotics in conjugacy classes for free groups

MMath (Masters of Mathematics), First Class Hons *2009–2013*
Dissertation: Periodic orbits for hyperbolic and quasihyperbolic toral automorphisms.

Publications and Preprints

2022a. "On the Skolem Problem for Reversible Sequences". Submitted. arXiv: 2203.07061.

2022b (with D. Amrollahi, E. Bartocci, L. Kovács, M. Moosbrugger, and M. Stankovic). "Solving Invariant Generation for Unsolvable Loops". Submitted.

2022c. "What is decidable about the Stochastic Reachability Problem?" Submitted.

2021a (with O. Klurman, E. Lefaucheux, F. Luca, P. Moree, J. Ouaknine, M. A. Whiteland, and J. Worrell). "On Inequality Decision Problems for Low-Order Holonomic Sequences". Submitted.

2021b (with O. Klurman, E. Lefaucheux, F. Luca, P. Moree, J. Ouaknine, M. A. Whiteland, and J. Worrell). "On Positivity and Minimality for Second-Order Holonomic Sequences". In: *International Symposium on Mathematical Foundations of Computer Science, MFCS 2021*, 67:1–67:15. DOI: 10.4230/LIPIcs.MFCS.2021.67.

2020 (with R. Lipton, J. Ouaknine, and J. Worrell). "On the Skolem Problem and prime powers". In: *International Symposium on Symbolic and Algebraic Computation, ISSAC 2021*. ACM. DOI: 10.1145/3373207.3404036.

2019 (with R. Sharp). "Statistics in conjugacy classes in free groups". In: *Geom. Dedicata* 198.1, pp. 57–70. DOI: 10.1007/s10711-018-0329-2.

2017 (with R. Sharp). "Orbit counting in conjugacy classes for free groups acting on trees". In: *J. Topol. Anal.* 9.4, pp. 631–647. DOI: 10.1142/S1793525317500261.

Teaching Experience

Institute of Logic and Computation, Technische Universität Wien
Co-lecturer for MSc seminar course on Formal Methods Seminar *2022*
Research supervision and assessment of research-skills.

Department of Computer Science, University of Oxford
Co-lecturer for MSc course Probabilistic Model Checking *2019–2020*
Model checking for both discrete- and continuous-time Markov chains.

St Peter's College, Oxford
Stipendiary Lecturer in Pure Mathematics *2018–2020*

- **Academic tutor** for second year undergraduates. Tutorials in *Linear Algebra*, *Lebesgue Integration*, *Group Theory* and *Graph Theory*. Duties included feedback, assessment, and writing progression reports.
- **Admissions interviewer** for prospective undergraduate mathematicians.

School of Mathematics, University of Bristol
Teaching Associate *2017–2018*
- **Academic tutor** for *Linear Algebra & Geometry*, *Calculus*, *Metric Spaces* and *Geometry*.

Mathematics Institute, University of Warwick
Teaching Assistant *2013–2017*
- **Undergraduate supervisor**. Small group teaching across the first year mathematics curriculum.
- **Support classes** in *Analysis, Metric Spaces, Experimental Maths* and *Dynamical Systems*.

Professional Qualification
Fellow of the Higher Education Academy *2019–*

Mathematics Institute, University of Warwick
Departmental teaching award for inspirational mathematics teaching.

Student Feedback
- "Always prepared, always cheerful and always willing to go that extra mile in helping students to understand—a true inspiration!"
- "He was engaging, whilst provoking the students to find their own way to the answers."
- "I was involved in an incident in term one and if it wasn't for his support, both [academic and pastoral], I wouldn't have made it through the term and hence the year."
- "George made me feel comfortable asking questions and. . . his analysis classes were a highlight of my week."

Recent Seminar Talks

Automated Program Reasoning Seminar, Technische Universität Wien
What is Decidable about the Markov Reachability Problem? *Nov 2021*

Open University, Dynamical Systems Seminar
On Positivity and Minimality for Second-Order Holonomic Sequences *Sept 2021*

Joint Forsyte (TU Wien) and IST (IST, Austria) seminar
On Positivity and Minimality for Second-Order Holonomic Sequences *Sept 2021*

Recent and Upcoming Conference Talks

Paris, Highlights of Logic, Automata, and Games
On the Skolem Problem for Reversible Sequences *June 2022*

Tallinn, International Symp. on the Mathematical Foundations of Computer Science
On Positivity and Minimality for Second-Order Holonomic Sequences *Aug 2021*

Kalamata, International Symposium on Symbolic and Algebraic Computation
On the Skolem Problem and Prime Powers *July 2020*

Widening Participation and Outreach

Mathematics in Education and Industry (Problem Solving Matters)
Mathematics Mentor for MAT and TMUA entrance exams. *2017*

Further Maths Support Programme
STEP/AEA workshops, enrichment days, RI masterclasses, and problem solving classes. *2012–2019*

Departmental & University Service

University of Warwick
Pay and remuneration committee for sessional teachers *2015–2017*
Staff & Graduate Student Liaison Committee (Mathematics) *2014–2017*