George Kenison

Institute of Logic and Computation – Technische Universität Wien

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Research Experience

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

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

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

Education

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

MMath (Masters of Mathematics), *University of Warwick*, *First Class Hons*. **2009–2013**
Dissertation: Periodic orbits of hyperbolic and quasi-hyperbolic 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

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

Co-lecturer for MSc course *Probabilistic Model Checking*, **2019–2020**
Department of Computer Science, University of Oxford.

Stipendiary Lecturer in Pure Mathematics, *St Peter's College, Oxford*. **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.

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

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

Fellow of the Higher Education Academy, *Professional Qualification*.

Departmental Teaching Award, *Mathematics Institute, University of Warwick*.

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."

Seminar Talks

On the Skolem Problem and Reversible Sequences, *TU Wien and ISTA*. **May 2022**

What is Decidable about the Markov Reachability Problem?, *TU Wien*. **Nov 2021**

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

On Positivity and Minimality for Second-Order Holonomic Sequences, *TU Wien and ISTA*. **Sept 2021**

Skolem's Problem and prime powers, *Oxford*. **Feb 2021**

Skolem's Problem and prime powers, *Bristol*. **Dec 2018**

Statistics in conjugacy classes in free groups, *Warwick*. **Jan 2018**

Statistics in conjugacy classes in free groups, *Bristol*. **Nov 2017**

Comparing length functions on free groups, *Warwick*. **May 2017**

Asymptotics in conjugacy classes for free groups, *Manchester*. **Nov 2017**

Orbit counting in conjugacy classes for free groups acting on trees, *Warwick*. **Nov 2015**

Conference and Workshop Talks

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

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

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

Skolem meets Euclid, *Moorea*, **June 2019**
Workshop on Dynamical Systems and Computation.

Asymptotics in conjugacy classes for group actions, *St Andrews*, **Aug 2016**
Young Researchers In Mathematics.

Asymptotics for free group actions, *Manchester*, **June 2016**
Workshop on Dynamical Systems, Ergodic Theory and Applications.

Orbit counting in conjugacy classes for free groups acting on trees, *Goettingen*, **Sept 2015**
Summer School on Dynamical Approaches in Spectral Geometry.

Widening Participation and Outreach

Mathematics in Education and Industry, *Problem Solving Matters*: *tutor and mentor*. **2017**

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

Departmental & University Service

Pay and remuneration committee for sessional teachers, *Warwick*. **2015–2017**

Staff & Graduate Student Liaison Committee (Mathematics), *Warwick*. **2014–2017**