

Jason M. Rute

CONTACT INFORMATION

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Dept of Mathematical Sciences
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RESEARCH INTERESTS

Mathematical logic, primarily computability theory and proof theory: computable analysis, algorithmic randomness, reverse mathematics, metastability, and proof mining.

Applications of logic to analysis, primarily probability theory and measure theory: martingales, almost-everywhere differentiable functions, ergodic theory, graph limits, and stochastic calculus.

ACADEMIC POSITIONS

University of Hawai'i, Manoa, HI, USA

Department of Mathematics

Junior Researcher, February 2013 to July 2013

- Conducting research on the relation between computability and stochastic calculus
- Continuing research in algorithmic randomness and effective mathematics

EDUCATION

Carnegie Mellon University, Pittsburgh, PA USA

Dept of Mathematical Sciences

Ph.D. Candidate, Mathematical Sciences, expected completion in Summer 2013

- Thesis Topic: Computable analysis of martingales and related measure-theoretic topics, with an emphasis on algorithmic randomness
- Advisor: Professor Jeremy Avigad

M.S., Mathematical Sciences, December 2010

University of Wisconsin, Madison, WI USA

B.S., Mechanical Engineering, December, 2004

- Additional major in Mathematics
- Additional major in Philosophy

PUBLISHED PAPERS

Avigad, J., Dean, E., Rute, J. Algorithmic randomness, reverse mathematics, and the dominated convergence theorem. *Annals of Pure and Applied Logic*, 163(12):1854-1864, 2012. [doi:10.1016/j.apal.2012.05.010](https://doi.org/10.1016/j.apal.2012.05.010). [arXiv:1106.0775](https://arxiv.org/abs/1106.0775).

Avigad, J., Dean, E., Rute, J. A metastable dominated convergence theorem. *Journal of Logic and Analysis*, 4:3:1-19, 2012. [doi:10.4115/jla.2012.4.3](https://doi.org/10.4115/jla.2012.4.3).

SUBMITTED PAPERS

Miyabe, K., Rute, J. Van Lambalgen's Theorem for uniformly relative Schnorr and computable randomness. Submitted. [arxiv:1209.5478](https://arxiv.org/abs/1209.5478).

Rute, J., Computable randomness and betting for computable probability spaces. Submitted. [arxiv:1203.5535](https://arxiv.org/abs/1203.5535).

Avigad, J., Rute, J. Oscillation and the mean ergodic theorem. Submitted. [arXiv:1203.4124](https://arxiv.org/abs/1203.4124).

PAPERS NOT YET SUBMITTED	<p>Rute, J. Algorithmic randomness, martingales, and differentiation I. In preparation. Preliminary draft at www.math.cmu.edu/~jrute/preprints/RMD1_paper_draft.pdf.</p> <p>Rute, J. Algorithmic randomness, martingales, and differentiation II. In preparation.</p> <p>Rute, J. Transformations which preserve computable randomness. In preparation.</p>
CONFERENCE PRESENTATIONS	<p>Ultrafilters and ergodic theory Arbeitsgemeinschaft: Ergodic Theory and Combinatorial Number Theory, Oberwolfach, Germany, October 7-19, 2012.</p> <p>Martingale convergence and algorithmic randomness. Logic Colloquium 2012, Manchester, UK, July 2012.</p> <p>Computable randomness and its properties. 7th Conference on Computability, Complexity and Randomness, Cambridge UK, July 2012.</p> <p>Computable randomness for computable probability spaces. Twelfth Asian Logic Conference (Invited speaker), Wellington, New Zealand, December 2011.</p> <p>Randomness, martingales and differentiability. Randomness and Analysis in Auckland, Auckland, New Zealand, December 2011.</p> <p>Randomness and the Lebesgue Differentiation Theorem. Graduate Student Conference in Logic, Chicago, IL, USA, May 2011.</p>
COURSEWORK	<p>Set Theory, Model Theory, Set Theory II, Model Theory II, PCF Theory, Measure Theory and Integration, Discrete Mathematics, Probability Theory, Functional Analysis, Descriptive Set Theory, Math Course Design, Proof Theory, Algebra, Stochastic Calculus (Audited)</p>
TEACHING AND GRADING EXPERIENCE	<p>Carnegie Mellon University, Pittsburgh, PA, USA <i>Dept of Mathematical Sciences</i></p> <p><i>Course Instructor</i></p> <p>Designed and taught a six week summer course covering all the material of a full semester course. Was responsible for syllabus, lectures, exams, homework assignments, and final grades.</p> <ul style="list-style-type: none"> • 21-122 Integration, Differential Equations and Approximation, Summer 2012. • 21-122 Integration, Differential Equations and Approximation, Summer 2011. <p><i>Teaching Assistant</i></p> <p>Taught recitation sections alongside a main lecture. Was responsible for teaching and grading.</p> <ul style="list-style-type: none"> • 21-127 Concepts of Mathematics, Fall 2012. • 21-120 Differential and Integral Calculus, Spring 2012. • 21-127 Concepts of Mathematics, Spring 2011. • 21-120 Differential and Integral Calculus, Fall 2010. • 21-111 Calculus I, Fall 2009. • 21-123 Calculus of Approximation, Spring 2009. • 21-122 Integration, Differential Equations and Approximation, Fall 2008. <p><i>Grader</i></p> <ul style="list-style-type: none"> • 21-127 Concepts of Mathematics, Summer 2010.

University of Wisconsin, Madison, WI, USA

Department of Mathematics

Grader

- Math 341 Linear Algebra (Proof-Based), Fall 2007
- Math 551 Topology, Fall 2007
- Math 571 Logic, Fall 2007

PROFESSIONAL
MEMBERSHIPS

American Mathematical Society

Association for Symbolic Logic