Neil Lutz
Postdoctoral Researcher and Instructor
Department of Computer and Information Science
University of Pennsylvania

nlutz@cis.upenn.edu
3401 Walnut Street
Room 455C
Philadelphia, PA 19104

Education

Ph.D. in Computer Science, Rutgers University, 2017
Advisor: Rebecca N. Wright

M.S. in Mathematics, Rutgers University, 2016
Committee chair: Michael Saks

B.S. in Mathematics with General Honors, University of Chicago, 2008

Research Interests

Algorithmic information theory, algorithmic game theory, fractal geometry, and dynamics.

Publications in Journals

Jack H. Lutz and Neil Lutz, "Algorithmic information, plane Kakeya sets, and conditional dimension," *ACM Transactions on Computation Theory (TOCT)* 10(2), 2018.

Aaron D. Jaggard, Neil Lutz, Michael Schapira, and Rebecca N. Wright, "Dynamics at the Boundary of Game Theory and Distributed Computing," *ACM Transactions on Economics and Computation (TEAC)* 5(3), 2017.

Jack H. Lutz and Neil Lutz, "Lines missing every random point," *Computability* 4(2), 2015.

Publications in Refereed Conference Proceedings

Jack H. Lutz, Robyn R. Lutz, Neil Lutz, and Matthew Riley, "Robustness and Games Against Nature in Molecular Programming," *Proceedings of the 41st International Conference on Software Engineering: New Ideas and Emerging Results (ICSE-NIER 2019)*.

Neil Lutz and D. M. Stull, "Projection Theorems Using Effective Dimension," *Proceedings of the 43rd International Symposium on Mathematical Foundations of Computer Science (MFCS 2018)*.

Neil Lutz, "Fractal Intersections and Products via Algorithmic Dimension," *Proceedings of the 42nd International Symposium on Mathematical Foundations of Computer Science (MFCS 2017)*.

Danny Dolev, Michael Erdmann, Neil Lutz, Michael Schapira, and Adva Zair, "Brief Announcement: Stateless Computation," *Proceedings of the 36th ACM Symposium on Principles of Distributed Computing (PODC 2017)*.

Neil Lutz and D. M. Stull, "Dimension Spectra of Lines," *Unveiling Dynamics and Complexity: Proceedings of the 13th Conference on Computability in Europe (CiE 2017)*.

Neil Lutz and D. M. Stull, "Bounding the Dimension of Points on a Line," *Proceedings of the 14th Annual Conference on Theory and Applications of Models of Computation (TAMC 2017)*.

Jack H. Lutz and Neil Lutz, "Algorithmic information, plane Kakeya sets, and conditional dimension," *Proceedings of the 34th International Symposium on Theoretical Aspects of Computer Science (STACS 2017)*.

Aaron D. Jaggard, Neil Lutz, Michael Schapira, and Rebecca N. Wright, "Self-stabilizing uncoupled dynamics," *Proceedings of the 7th International Symposium on Algorithmic Game Theory (SAGT 2014)*.

Jack H. Lutz and Neil Lutz, "Lines missing every random point," *Language, Life, Limits: Proceedings of the 10th Conference on Computability in Europe (CiE 2014)*.

Expository Writing

Neil Lutz, "Open Problems Column: Some open problems in algorithmic fractal geometry," edited by William Gasarch, *SIGACT News* 48(4), 2017.

Preprints

Christopher Jung, Sampath Kannan, and Neil Lutz, "Quantifying the Burden of Exploration and the Unfairness of Free Riding," arXiv:1810.08743 [cs.LG], 2019.

Neil Lutz, "A Note on Pointwise Dimensions," arXiv:1612.05849 [cs.CC], 2016.

Danny Dolev, Michael Erdmann, Neil Lutz, Michael Schapira, and Adva Zair, "Stateless Computation," arXiv:1611.10068 [cs.DC], 2016.

Invited Talks at Conferences

"Algorithmic Dimensions of Projected Points," *AMS-ASL Special Session on Algorithmic Dimensions and Fractal Geometry*, Joint Mathematics Meetings, Baltimore, MD, January 2019.

"Algorithmic Dimensions of Projected Points," *Fourteenth International Conference on Computability, Complexity and Randomness (CCR)*, Santiago, Chile, December 2018.

"Effective Dimensions of Projected Points," *Fifteenth International Conference on Computability and Complexity in Analysis (CCA)*, Lake Kochel, Germany, August 2018.

Seminar and Workshop Talks

"Free-riding with Bandits: Shirking the Burden of Exploration," Simons Institute for the Theory of Computing, University of California, Berkeley, July 2018.

"Fractal Intersections and Products via Algorithmic Dimension," *Continuity, Computability, Constructivity — From Logic to Algorithms (CCC)*, Nancy, France, June 2017.

"Algorithmic Fractal Geometry," University of Pennsylvania, May 2017.

"Stateless Computation," U.S. Naval Research Laboratory, May 2017.

"Fractal Geometry via Algorithmic Information" (short talk), *New York Area Theory Day*, New York University, December 2016.

"Algorithmic Information, Plane Kakeya Sets, and Conditional Dimension," *DIMACS Theory of Computing Seminar*, Rutgers University, March 2016.

Research Experience

Postdoctoral Researcher, Department of Computer and Information Science, University of Pennsylvania, supervised by Sampath Kannan, fall 2017–present.

Graduate Research Assistant, Center for Discrete Mathematics and Theoretical Computer Science (DIMACS), Rutgers University, supervised by Rebecca Wright, fall 2012–spring 2016.

Visiting Research Fellow, School of Computer Science and Engineering, Hebrew University of Jerusalem, supervised by Michael Schapira, summer–fall 2015.

Graduate Research Assistant, Department of Computer Science, Rutgers University, supervised by Michael Saks, fall 2011 and summer 2012.

NYC Turing Fellow, Flat World Knowledge, summer 2011.

NASA Space Grant Fellow, Jet Propulsion Laboratory, summer 2008.

Caltech Summer Undergraduate Research Fellow, Jet Propulsion Laboratory, summer 2006 and summer 2007.

Teaching Experience

Instructor, Department of Computer and Information Science, University of Pennsylvania.
- Algorithms & Computation (graduate), spring 2019
- Introduction to Algorithms (undergraduate), fall 2017 and fall 2018
- Theory of Computation (graduate, co-taught with Sampath Kannan), spring 2018

Course Developer, Penn Engineering Online Learning, University of Pennsylvania, fall 2018
- Mathematical Foundations of Computer Science (graduate, co-developed with Val Tannen)

Teaching Assistant, Department of Computer Science, Rutgers University.
- Design and Analysis of Computer Algorithms (undergraduate), spring 2011 and spring 2017
- Discrete Structures II (probability theory), fall 2016
- Formal Languages and Automata, spring 2012
- Design and Analysis of Data Structures and Algorithms (graduate), fall 2010
- Introduction to Computer Science in Java, spring 2010
- Computer Applications for Business, fall 2009

Participation in Invitation-Only Programs

Descriptive Set Theory and Computable Topology, Schloss Dagstuhl, Wadern, Germany, April 2020.

Summer Cluster: Fairness, Simons Institute for the Theory of Computing, University of California, Berkeley, May–July 2019.

Summer Cluster: Algorithmic Fairness, Simons Institute for the Theory of Computing, University of California, Berkeley, July 2018.

Nexus of Computation and Information Theories, Centre International de Rencontres Mathématiques, Marseille, France, and Institut Henri Poincaré, Paris, France, January–February 2016.

Professional Activities

Member of scientific program committee, *Sixteenth International Conference on Computability and Complexity in Analysis (CCA 2019)*.

Reviewer

- *Information and Computation*
- *Theoretical Computer Science*
- *ACM Symposium on the Theory of Computing (STOC)*

Grants and Awards

Best Student Paper at the *42nd International Symposium on Mathematical Foundations of Computer Science (MFCS)*, Aalborg, Denmark, August 2017.

Travel support from the French National Center for Scientific Research to attend the *Nexus of Computation and Information Theories* program in Marseille and Paris, France, January–February 2016.

Association for Symbolic Logic travel grant to attend the *10th Conference on Computability in Europe (CiE)*, Budapest, Hungary, June 2014.