

Joshua M. Siktar

Curriculum Vitae

Contact Information

Address: 2428 Briarhill Court, White Oak, PA 15131

Email: jsiktar@vols.utk.edu, jsiktar@alumni.cmu.edu

Phone: 412-860-3371

LinkedIn: <https://www.linkedin.com/in/joshuasiktar1/>

Webpage: <https://joshuasiktarcomputationalarchive.weebly.com>

ArXiv preprints: [https://arxiv.org/search/?](https://arxiv.org/search/?query=Joshua+Siktar&searchtype=all&source=header)

[query=Joshua+Siktar&searchtype=all&source=header](https://arxiv.org/search/?query=Joshua+Siktar&searchtype=all&source=header)

Research Interests

Peridynamics, optimal control, finite element methods, calculus of variations (particularly Lavrentiev gap theory), harmonic analysis, enumerative combinatorics

Education

Doctorate of Philosophy in Mathematics, University of Tennessee (in progress, expected May 2024)

Master of Science in Mathematics, University of Tennessee (August 2019 - May 2021)

Advisors: Tadele Mengesha and Abner Salgado

Coursework: Neural Networks, Optimization, Finite Element Methods, Partial Differential Equations, Numerical Analysis, Obstacle Problems (reading course), Functional Analysis, Real Analysis, Geometric Measure Theory, Complex Analysis, Differential Geometry

GPA: 3.97/4.0

Bachelor of Science, Carnegie Mellon University (August 2015 - December 2018)

Major: Mathematical Sciences

Minor: Philosophy

GPA: 3.37/4.0

Publications

Peer-Reviewed Publications

Tadele Mengesha, Abner J. Salgado, Joshua M. Siktar: “Analysis and Finite Elements of Optimal Design in Peridynamics” (in preparation).

Xiaobing Feng, Joshua M. Siktar: “Gamma Convergence with Discontinuous Ritz Methods for the Manià’s Problem of Lavrentiev Gap Phenomenon” (in preparation).

Javier Cueto, Joshua M. Siktar: “On the Convergence of Solutions for Non-local Optimal Control Problems with Varying Fractional Parameter” (in preparation).

Tadele Mengesha, Abner J. Salgado, Joshua M. Siktar: “On the Optimal Control of a Linear Peridynamics Model,” *Applied Mathematics and Optimization*, Vol. 88, August 2023.

Steven J. Miller, Fei Peng, Tudor Popescu, Joshua M. Siktar, Nawapan Wattanawanichkul, The Polymath REU Program: “Walking to Infinity Along Some Number Theory Sequences” (in preparation).

Amelia Gilson, Hadley Killen, Tamás Lengyel, Steven J. Miller, Nadia Razek, Joshua M. Siktar, Liza Sulkin: “Zeckendorf’s Theorem Using Indices in an Arithmetic Progression,” *The Fibonacci Quarterly*, Vol. 59 No. 4, December 2021.

Vedant Bonde, Joshua M. Siktar, “On the Combinatorics of Placing Balls into Ordered Bins,” *INTEGERS*, Vol. 21, August 2021.

Evan Fang, Jonathan Jenkins, Zack Lee, Daniel Li, Ethan Lu, Steven J. Miller, Dilhan Salgado, Joshua M. Siktar: “Central Limit Theorems for Compound Paths on the 2-Dimensional Lattice,” *The Fibonacci Quarterly*, Vol. 58 No. 3, September 2020.

Eric Chen, Robin Chen, Lucy Guo, Steven Jiang, Steven Miller, Joshua M. Siktar, Peter Yu: “Gaussian Behavior in Zeckendorf Decompositions from Lattices,” *The Fibonacci Quarterly*, Vol. 57 No. 3, September 2019.

Joshua M. Siktar: “Recasting the Proof of Parseval’s Identity,” *Turkish Journal of Inequalities*, Issue 3 Vol. 1, July 2019.

=====

Non-Peer Reviewed Publications

I routinely write blog posts about mathematics, math education, and my experiences as a teacher and researcher. My platforms for blogging include:

Medium: <https://medium.com/@joshuasiktar>

TealFeed: <https://tealfeed.com/joshuasiktarb44>

LinkedIn: <https://www.linkedin.com/in/joshuasiktar1/recent-activity/posts/>

=====

Research Presentations

Invited Talks

“Walking to Infinity Along Some Number Theory Sequences.” 103rd Annual MAA Southeastern Sectional Meeting, Knoxville, Tennessee, March 2024.

“Analysis and Discretization of Optimal Control Problems in Peridynamics.” 2024 Joint Mathematics Meetings, San Francisco, CA, January 2024.

“Analysis and Discretization of Optimal Control Problems in Peridynamics.” The 8th Annual Meeting of SIAM Central States Section, Lincoln, NE, October 2023.

“Analysis and Discretization of Optimal Control Problems in Peridynamics.” University of Pittsburgh Analysis and PDE Seminar, Pittsburgh, PA, October 2023.

“Analysis and Discretization of Optimal Control Problems in Peridynamics.” AMS Central Section Meeting, Cincinnati, OH, April 2023.

“Asymptotic Analysis For Lattice Walks Derived From Zeckendorf Decompositions.” 19th International Fibonacci Conference (virtual), July 2020.

“On the Counting of Zeckendorf Decompositions With a Two- Dimensional Lattice.” 2018 Joint Mathematics Meetings, San Diego, CA, January 2018.

Contributed Talks and Other Research Presentations

“Asymptotic Compatibility of Optimal Control Problems in Peridynamics.” Fall 2023 Finite Element Circus, Notre Dame, South Bend, IN, October 2023.

“Grad School Journeys: Nonlocal Edition.” Carnegie Mellon University Undergraduate Math Club, Pittsburgh, PA, October 2023.

“Analytical Modeling of Piezoelectric Stack Actuators for Vibrafuge Applications.” Nonlinear Mechanics and Dynamics Research Institute, Albuquerque, NM, August 2023.

“An Optimal Control Problem in Peridynamics: Analysis and Discretization.” University of Tennessee Computational and Applied Math Seminar, Knoxville, TN, November 2022.

“A Tale of Two Uniqueness Problems: Optimal Control in Solid Mechanics.” University of Tennessee SIAM Research Showcase, Knoxville, TN, March 2022.

“On the Combinatorics of Placing Balls into Ordered Bins.” SIAM-DM 2021 Annual Meeting, Virtual, July 2021.

“On the Combinatorics of Placing Balls into Ordered Bins.” Graduate Student Combinatorics Conference, Virtual, April 2021.

“On the Combinatorics of Placing Balls into Ordered Bins.” 46th Annual New York State Regional Graduate Mathematics Conference, Virtual, April 2021.

“Integral Cauchy-Schwarz Inequality and Parseval’s Identity.” 2019 SIAM SEAS Regional Conference, Contributed Presentation Session, Knoxville, TN, September 2019.

“Recasting the Proof of Parseval’s Equation.” 2019 Joint Mathematics Meetings, Inequalities and their Applications Contributed Paper Session, Baltimore, MD, January 2019.

“Gaussian Behavior in Zeckendorf Decompositions Arising From Lattices.” Young Mathematicians’ Conference, Columbus, OH, August 2018.

Outreach and Math Education Presentations

“Ballot Box Bugglers: Unexpected Connections Between Voting and Fairness.” MAA Southeastern Section 2021, Recreational Mathematics Special Session (virtual), March 2021.

“From Undergraduate Research to Graduate School: Mentorship and Mathematical Maturity.” Maryville College, Maryville, TN, November 2020.

“On the Techniques of Evaluating Binomial Coefficients.” Winchester Thurston School Mu Alpha Theta Society, Pittsburgh, PA, February 2019.

“Convexity of Personal Investments.” Winchester Thurston School Math Models Presentation, Pittsburgh, PA, February 2019.

“Then and Now: The Mellon College of Science Freshmen Experience.” Carnegie Mellon University Family Weekend Celebration, Pittsburgh, PA, October 2018.

“Developing as a Professional at Lockheed Martin.” Carnegie Mellon University Orientation, Pittsburgh, PA, August 2018.

“An Introduction to Supervised Learning.” Lockheed Martin Enterprise Business Solutions Internship Program, King of Prussia, PA, July 2018.

=====

Courses Taught

University of Tennessee-Knoxville (while a Ph.D. student):

- Basic Calculus (MATH 125) (Spring 2020, Fall 2022)
- College Algebra (MATH 119) (Fall 2019)
- Mathematical Reasoning (MATH 113) (Fall 2020, Spring 2021, Fall 2021, Spring 2022, Spring 2023)

Carnegie Mellon University (before beginning Ph.D. studies):

- Mellon College of Science Freshmen Seminar (38101) (Fall 2018)
 - Introduction to Mathematical Research (21499) (Spring 2019)
 - Methods and Models for Optimization (21257) (Spring 2017)
- =====

Conferences, Workshops, and Special Sessions Organized

“Theory of Integer Sequences,” 103rd Annual MAA Southeastern Sectional Meeting, Knoxville, Tennessee, March 2024.

=====

Conferences and Workshops Attended

103rd Annual MAA Southeastern Sectional Meeting, Knoxville, Tennessee, March 2024.

2024 Joint Mathematics Meetings, San Francisco, California, January 2024.

Fall 2023 Finite Element Circus, Notre Dame. South Bend, IN, October 2023.

The 8th Annual Meeting of SIAM Central States Section. Lincoln, NE, October 2023.

AMS Central Sectional Meeting. Cincinnati, OH, April 2023.

Nonlocal School of Fractional Equations. Ames, IA, June 2022.

One Nonlocal World Nonlocal Codes Conference. Virtual, December 2021.

17th Prairie Analysis Seminar. Virtual, November 2021.

Nonlocality in Analysis, Numerics, and Applications. Virtual, October 2021.

SIAM Annual Meeting. Virtual, July 2021.

CMAI Meets Industry Symposium. Virtual, June 2021.

50th Annual Barrett Lectures. Virtual, May 2021.

Graduate Student Combinatorics Conference. Virtual, April 2021 (served as contributed session chair).

46th Annual New York State Regional Graduate Mathematics Conference. Virtual, April 2021.

MAA Southeastern Section 2021. Virtual, March 2021.

One Nonlocal World Opening Event. Virtual, January 2021.

19th International Fibonacci Conference. Virtual, July 2020.

SIAM Annual Meeting. Virtual, July 2020.

SIAM SEAS Annual Meeting. Knoxville, TN, September 2019.

Joint Mathematics Meetings. Baltimore, MD, January 2019.

Young Mathematicians' Conference. Columbus, OH, August 2018.

Joint Mathematics Meetings. San Diego, CA, January 2018.

SIAM Annual Meeting. Pittsburgh, PA, July 2017.

=====

Refereeing Contributions

Annals of Combinatorics [1 article], *The Fibonacci Quarterly* [1 article], *The Journal of Number Theory* [1 article], *Numerical Methods for Partial Differential Equations* [1 article]

=====

Other Service Activities

Graduate student screener of AI faculty candidates, April 2023.

Panelist for University of Tennessee SIAM Graduate Internship Panel, February 2023.

Number Theory and Combinatorics Research Project Mentor, Williams College, May 2019 - October 2020.

Number Theory and Combinatorics Research Project Mentor, Eureka Program, May 2019 - August 2019.

Panelist for Carnegie Mellon Mathematics Department Graduate Application Advice Panel, May 2019.

Carnegie Mellon Physics Concepts Outreach Program Mentor, August 2017 - February 2018.

Carnegie Mellon Informatics and Mathematics Competition Cofounder and Director of Outreach, August 2015 - February 2017.

=====

Industry Experience

Sandia National Laboratories Research Internship, Nonlinear Mechanics and Dynamics Institute, Albuquerque, NM, June - August 2023.

Exprii Content Development/SEO Internship, Pittsburgh, PA, May - August 2020, January - July 2019.

Lockheed Martin Software Engineering Internship, King of Prussia, PA, May - August 2018.

Management Science Associates IT Intern, Pittsburgh, PA, May - August 2016.

University of Pittsburgh Medical Center Python Modeler, Pittsburgh, PA, June - August 2015.

=====

Memberships

MAA, February 2020 - Present

AMS, November 2019 - Present

AWM University of Tennessee Student Chapter, October 2019 - Present

SIAM University of Tennessee Student Chapter, August 2019 - Present (Press Secretary May 2020 - May 2021)

Awards/Research Support

SIAM Central States Sectional Meeting Travel Grant, September 2023 (\$150+hotel)

Spike Tickle STEM Endowed Fellowship, April 2023 (\$5,000)

University of Tennessee Graduate Student Senate Travel Award, April 2023 (\$600)

American Mathematical Sciences Student Sectional Travel Grant, April 2023 (\$250)

NSFE Workshop 2022 Travel Award, June 2022 (\$400)

Graduate Research Assistant (NSF Grant, DMS 2111228), University of Tennessee-Knoxville, May 2022 - April 2023, August 2023 - July 2024

University of Tennessee SIAM 2nd Annual Graduate Research Presentation Competition, Second Place, April 2022 (\$50)

University of Tennessee Math GTA Teaching Excellence Fellowship, April 2022 (\$250)

University of Tennessee Eaves GTA Teaching Award Finalist, April 2022

Graduate Research Assistant (NSF Grant DMS 1910180), University of Tennessee-Knoxville, May 2021 - August 2021

Carnegie Mellon University Mellon College of Science College Honors, May 2019

Certifications

Responsible Conduct of Research for Administrators, CITI Program, July 2021

Course-Based Assessment Certification, University of Tennessee-Knoxville Teaching & Learning Innovation, February 2021

Inclusive Teaching Certification, University of Tennessee-Knoxville Teaching & Learning Innovation, February 2021

