

ALEXANDER NICHOLAS SIETSEMA

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RESEARCH INTERESTS

Numerical Linear Algebra, Optimization, Machine Learning, Data Science, Applications.

CITIZENSHIP

USA

EDUCATION

Ph.D., Computational and Applied Mathematics (in progress) <i>University of California, Los Angeles</i> Advanced to candidacy	2022 – present Los Angeles, CA Fall 2024
M.A., Computational and Applied Mathematics <i>University of California, Los Angeles</i>	2022 – 2024 Los Angeles, CA
B.S., Advanced Mathematics; B.S., Computational Mathematics <i>Michigan State University</i> <i>Dual-enrolled during high school</i>	2018 – 2022 East Lansing, MI 2017 – 2018
Lansing Community College <i>Dual-enrolled during high school</i>	Lansing, MI 2016 – 2017

PUBLICATIONS

JOURNAL PUBLICATIONS

4. Benjamin Jarman, Lara Kassab, Deanna Needell, Alexander Sietsema - “Stochastic Iterative Methods for Online Rank Aggregation from Pairwise Comparisons.” BIT Numerical Mathematics vol. 64, 2024.
<https://link.springer.com/article/10.1007/s10543-024-01024-x>
3. Rachel Domagalski, Sergi Elizalde, Jinting Liang, Quinn Minnich, Bruce E. Sagan, Jamie Schmidt, Alexander Sietsema - “Cyclic Pattern Containment and Avoidance.” Advances in Applied Mathematics, vol. 135, 2022. <https://www.sciencedirect.com/science/article/abs/pii/S019688582200001X>
2. Domagalski, Jinting Liang, Quinn Minnich, Bruce E. Sagan, Jamie Schmidt, Alexander Sietsema - “Pinnacle Set Properties, 2021.” Discrete Mathematics, vol. 345, iss. 7, 2022.
<https://www.sciencedirect.com/science/article/abs/pii/S0012365X22000887>
1. Rachel Domagalski, Jinting Liang, Quinn Minnich, Bruce E. Sagan, Jamie Schmidt, Alexander Sietsema - “Cyclic Shuffle Compatibility.” Séminaire Lotharingien de Combinatoire, vol. 85, 2021.
<https://www.mat.univie.ac.at/~slc/wpapers/s85domasaga.pdf>

CONFERENCE PUBLICATIONS

2. Alexander Sietsema, Zerrin Vural, James Chapman, Yotam Yaniv, Deanna Needell - “Stratified Non-Negative Tensor Factorization.” To appear, Proc. 58th Asilomar Conf. on Signals, Systems and Computers, Pacific Grove, CA, 2024. <https://arxiv.org/abs/2411.18805>

1. Alexander N. Sietsema, Michael T. McCann, Marc L. Klasky, Saiprasad Ravishankar - "Comparing One-step and Two-step Scatter Correction And Density Reconstruction In X-Ray CT." 7th International Conference on Image Formation in X-Ray Computed Tomography, vol. 12304, 2022.
<https://www.spiedigitallibrary.org/conference-proceedings-of-spie/12304/2647151/Comparing-one-step-and-two-step-scatter-correction-and-density/10.1117/12.2647151.full?SS0=1>

TEACHING EXPERIENCE

Python With Applications II Teaching Assistant <i>Wrote discussion materials, led discussion sessions, evaluated student projects.</i>	Spring 2023 – present
Python With Applications I Teaching Assistant <i>Wrote discussion materials, led discussion sessions, graded exams, led study sessions.</i>	Fall 2022, Winter 2023, Spring 2024
Honors Linear Algebra Undergraduate Learning Assistant <i>Led recitation sessions, graded homeworks, tests, exams, led study sessions, held LaTeX learning sessions.</i>	Fall 2021
Calculus I Course Assistant <i>Answered questions on Piazza, led biweekly help sessions for students, graded exams.</i>	Spring 2020
Calculus II Undergraduate Learning Assistant <i>Supervised two sections, led recitations sessions, led special review sessions, graded labs, quizzes, and exams.</i>	Fall 2019

PRESENTATIONS / POSTERS

CONFERENCE / POSTER PRESENTATIONS

Stratified Non-Negative Tensor Factorization <i>Asilomar Conference on Signals, Systems, and Computers</i>	October 2024
Stochastic Iterative Methods for Online Rank Aggregation from Pairwise Comparisons <i>'Research in the Age of AI' Symposium</i>	February 2024
Comparing One-Step and Two-Step Descattering and Reconstruction <i>CT Meeting 2022, CMSE Department Student Research Symposium</i>	June 2022
An Algorithm For Counting Admissible Pinnacle Orderings <i>Permutation Patterns 2021 (Univ. of Strathclyde Combinatorics Group)</i>	June 2021
Pattern Avoidance in Cyclic Permutations <i>Joint Mathematics Meetings Poster Session, JMU SUMS Poster Session</i>	January 2021
A Cyclic Variant of the Erdős-Szekeres Theorem <i>Joint Mathematics Meetings Poster Session, JMU SUMS Poster Session</i>	January 2021
Pattern Avoidance in Cyclic Permutations <i>SUMS Conference at James Madison University</i>	November 2020

SEMINAR PRESENTATIONS

A Stochastic Subtraction Game <i>Department of Mathematics Graduate And Undergraduate Student Seminar</i>	March 2022
Semi-Supervised Learning <i>Michigan State University Undergraduate Research and Arts Forum</i>	April 2021
Pattern Avoidance in Cyclic Permutations <i>Department of Mathematics Graduate And Undergraduate Student Seminar</i>	January 2021

HONORS

Jane Street Mystery Planet Winner	2024
<i>Jane Street Mystery Planet Los Angeles</i>	
Susquehanna International Group Brainteaser Battle UCLA Winner	2024
<i>UCLA Brainteaser Battle</i>	
Susquehanna International Group Brainteaser Battle UCLA Runner-Up	2022
<i>UCLA Brainteaser Battle</i>	
Outstanding Poster	2021
<i>Joint Mathematics Meetings Poster Session, "Pattern Avoidance in Cyclic Permutations"</i>	
Honorable Mention Poster	2021
<i>Joint Mathematics Meetings Poster Session, "A Cyclic Variant of the Erdős-Szekeres Theorem"</i>	
Herbert T. Graham Scholarship	2020, 2021, 2022
<i>Department of Mathematics Award</i>	
Paul and Wilma Dressel Endowed Scholarship	2019
<i>Department of Mathematics Award</i>	
FAITH Endowment Scholarship for Academic Excellence	2018 – 2022
<i>Endowment for Greek Orthodoxy and Hellenism</i>	
Dr. Helene Tzitsikas Education Scholarship	2018
<i>Holy Trinity Greek Orthodox Church Parish Award</i>	
Michigan State University Alumni Distinguished Freshman	2018 – 2022
<i>University full-tuition scholarship</i>	
Dean's List	2018 – Present
<i>(all undergraduate semesters)</i>	

TECHNICAL SKILLS

Languages: Python, Matlab, R, L^AT_EX, Julia, C++, C#
Libraries: Pandas, NumPy, itertools, Matplotlib, Seaborn, Plotly, scikit-learn, SciPy, Statsmodels, BeautifulSoup, Requests, Selenium, Scrapy, Tensorflow, Keras, PyTorch, Anaconda, Numba, asyncio

PROJECTS

Scripps National Spelling Bee	Spring 2024
<i>(Subject to NDA)</i>	
Analysis of word list difficulty leveling and in-competition word selection.	
Honors Senior Thesis	Spring 2022
<i>Advisor: Albert Cohen</i>	
Exploring game theoretic properties and theorems for an novel stochastic variant of the classical subtraction game, including optimal move selection and conditions for excluding available moves, with applications to sports analytics.	
Projects in Industrial Mathematics	Spring 2022
<i>Advisor: Peiru Wu</i>	
Creating a data handling pipeline for hospital Medicare and Medicaid cost reports, as well as investigating trends in those reports. Industry project with The Rybar Group.	
Appelö High Order Group	Fall 2021
<i>Advisor: Daniel Appelö</i>	
Developing and analyzing computational tools for quantum computing applications.	
MSU Risk Management and Sports Analytics Group	Fall 2021
<i>Advisor: Albert Cohen</i>	
Developing new methods for optimal decision making for two-point conversion attempts in American football; analyzing the effects of fights in hockey on the outcomes of games.	
UCLA Computational and Applied Mathematics REU	Summer 2021
<i>Advisor: Jamie Haddock</i>	
Exploring Kaczmarz methods for inconsistent and corrupted linear systems and their connections to maximum likelihood estimation techniques for ranking sports teams.	

Department of Mathematics Exchange Program

Spring 2021

Advisor: Ekaterina Rapinchuk

Exploring methods and tools for semi-supervised learning and graph-based learning.

MSU Signals, Learning, and Imaging Group

Spring 2020 – Spring 2022

Advisor: Saiprasad Ravishankar

Investigating algorithms for correcting scattering artifacts in MeV tomography measurements in collaboration with researchers at Los Alamos National Laboratories. Additionally, considering data-driven algorithms to solve compressed sensing problems.

EXTRACURRICULAR ACTIVITIES

UCLA Math Department Ultimate Frisbee (2022 – present) | Organizer**MSU Math Department Ultimate Frisbee (2018 - 2022)** | Organizer**Phantom Regiment Drum and Bugle Corps (2019)** | Euphonium, small ensemblist*2019 Drum Corps International World Class Championship Finalist***Michigan State University Spartan Marching Band (2018)** | Baritone**Legends Drum and Bugle Corps (2018)** | Baritone*2018 Drum Corps International Open Class Championship Finalist***Interests:** Escape rooms, music, cooking, hiking, ultimate frisbee, euchre, hockey, college football