

ABI KOTHAPALLI

■ +1 (913) 940-9705 | @ abi.kothapalli@vanderbilt.edu | 📧 abikothapalli | 🌐 abi-kothapalli.github.io

EDUCATION

Vanderbilt University

Master of Science (with Thesis) in Computer Science (GPA: 4.00/4.00)

Bachelor of Science with Honors in Computer Science & Mathematics (GPA: 4.00/4.00)

- Minors in Physics & Scientific Computing

Nashville, TN

Aug. 2023 – May 2025

Aug. 2021 – May 2025

RESEARCH EXPERIENCE

Department of Mathematics, Vanderbilt University

Undergraduate Research Assistant | Mentors: Dr. Rocio Diaz Martin, Dr. Akram Aldroubi

- Studying theoretical extensions of the optimal transport (OT) problem, including dynamical OT and multi-stage transport.
- Presenting novel theoretical results on multi-stage transport at the *Joint Mathematics Meetings (JMM) 2025*.

Machine Intelligence and Neural Technologies (MINT) Lab, Vanderbilt University

Undergraduate Research Assistant | Mentor: Dr. Soheil Kolouri

- Studying extensions of the Gromov-Wasserstein problem for metric measure spaces in the partial transport and linearized partial transport settings [1,2].
- Developed computational OT method to compare spherical distributions based on the stereographic projection mapping and the generalized Radon transform [3].
- Studied set classification architectures for point cloud classification tasks. Investigated the performance tradeoffs between varying complexities in different components of permutation-invariant architectures [4].

Institute for Software Integrated Systems (ISIS), Vanderbilt University

Undergraduate Research Assistant | Mentor: Dr. Xenofon Koutsoukos

- Studied the minimum dominating set (MDS) problem, an NP-hard combinatorial optimization problem on graphs.
- Developed novel heuristic algorithm to approximate solutions to the MDS problem by learning vertex embeddings using graph convolutional networks [5].

Moyer Lab, Vanderbilt University

Undergraduate Research Assistant | Mentor: Dr. Daniel Moyer

- Studied mathematical properties of recurrent neural networks (RNNs) using functional iteration theory to improve neural network optimization and efficiency. Explored connections between RNNs and OT.

PREPRINTS & PUBLICATIONS

(*) indicates equal contribution

- [1] Yikun Bai, **Abihith Kothapalli***, Hengrong Du*, Rocio Diaz Martin*, and Soheil Kolouri. Linear Partial Gromov-Wasserstein Embedding. *Under Review at International Conference on Learning Representations (ICLR)*, 2024. [\[ArXiv\]](#)
- [2] Yikun Bai, Rocio Diaz Martin*, **Abihith Kothapalli***, Hengrong Du, Xinran Liu, and Soheil Kolouri. Partial Gromov-Wasserstein Metric. *Under Review at International Conference on Learning Representations (ICLR)*, 2024. [\[ArXiv\]](#)
- [3] Huy Tran*, Yikun Bai*, **Abihith Kothapalli***, Ashkan Shahbazi, Xinran Liu, Rocio Diaz Martin, and Soheil Kolouri. Stereographic Spherical Sliced Wasserstein Distances. *International Conference on Machine Learning (ICML) (Spotlight, Top 3.50%)*, 2024. [\[ArXiv\]](#)
- [4] **Abihith Kothapalli**, Ashkan Shahbazi, Xinran Liu, Robert Sheng, and Soheil Kolouri. Equivariant vs. Invariant Layers: A Comparison of Backbone and Pooling for Point Cloud Classification. *International Conference on Machine Learning (ICML) Geometry-grounded Representation Learning and Generative Modeling Workshop*, 2024. [\[ArXiv\]](#)
- [5] **Abihith Kothapalli**, Mudassir Shabbir, and Xenofon Koutsoukos. Learning-Based Heuristic for Combinatorial Optimization of the Minimum Dominating Set Problem using Graph Convolutional Networks. *Under Review at Neurocomputing*, 2023. [\[ArXiv\]](#)
- [6] **Abihith Kothapalli**, Hinrich Staecker, and Adam Mellott. Supervised machine learning for automated classification of human Wharton's Jelly cells and mechanosensory hair cells. *PLOS ONE*, 16(1):1–11, 2021.

HONORS & AWARDS

| | |
|--|----------------------|
| Computing Research Association (CRA) Outstanding Undergraduate Researcher Award Finalist | Dec. 2024 |
| Vanderbilt Top 20 Outstanding Senior Award | Oct. 2024 |
| Immersion Vanderbilt Research Grant (\$2,000) | Sep. 2024 |
| International Conference on Machine Learning (ICML) Spotlight (Top 3.50%) | Jul. 2024 |
| ICPC North American Championship Finalist & Honorable Mention (Regional Gold Medalist) | May 2024 |
| Vanderbilt Graduate School Travel Grant (\$1,000), School of Engineering Travel Grant (\$500, \$750) | May 2024 |
| Vanderbilt Data Science Institute Summer Research Fellow (\$6,000) | Apr. 2024 |
| Young Researcher at the 11th Heidelberg Laureate Forum (1 of 200 Selected Globally) | Apr. 2024 |
| Vanderbilt Undergraduate Research Fair Two-Time Best Poster Award | Nov. 2023, Apr. 2024 |
| Vanderbilt Undergraduate Changemaker Award (1 of 40 Awarded Across Vanderbilt Student Body) | Mar. 2024 |
| Putnam Mathematical Competition Top 500 | Feb. 2023 |
| Cornelius Vanderbilt Scholarship (Full-Tuition Merit Scholarship; ~\$250,000) | 2021-2025 |

WORK EXPERIENCE

Susquehanna International Group (SIG)

Philadelphia, PA

Quantitative Trading Intern

Jun. 2023 – Aug. 2023

- Intern on the Algorithmic Prediction and Execution desk. Learned about execution and high-frequency trading strategies, including both development and maintenance.
- Developed novel trading strategy using large language models (LLMs) to parse SEC filings in real-time and automatically make trades. Demonstrated profitability of model in backtesting.
- Completed options education and market-making program, and competed in mock trading.

Meta Platforms

Menlo Park, CA

Software Engineering Intern

May 2022 – Aug. 2022

- Intern on Ads ML Automation team. Developed reliability monitoring system for Meta's release blueprint platform, an internal ML infra tool to automate production release of trained ads ranking models across Meta products.
- Built automated testing platform to monitor end-to-end release blueprint pipeline – including recurring training, model evaluation, and launch – for over 140 model types used across platforms including Instagram, Facebook, and WhatsApp.
- Identified and corrected failures, increasing blueprint success rate from $\sim 70\%$ to $> 90\%$, drastically improving reliability.

TEACHING EXPERIENCE

Group Recitation Tutor, Vanderbilt University

Fall 2023, Spring 2024, Fall 2024

MATH 1300: Calculus I, MATH 1301: Calculus II, MATH 2420: Differential Equations

Teaching Assistant, CS 4262: Foundations of Machine Learning

Spring 2024, Fall 2024

Department of Computer Science, Vanderbilt University

Teaching Assistant, MATH 2820: Probability & Mathematical Statistics

Spring 2023, Fall 2023

Department of Mathematics, Vanderbilt University

Teaching Assistant, CS 2201: Data Structures

Fall 2022

Department of Computer Science, Vanderbilt University

CAMPUS INVOLVEMENT

Change++ | *Vice President, Senior Mentor*

Oct. 2021 – Present

- Registered 501(c)(3) nonprofit that partners with nonprofits globally with the mission of building impactful technology.
- Lead efforts to recruit new engineering managers, product managers, software developers, and UI/UX designers.
- Organize events such as coding workshops, mini-hackathons, resume workshops, faculty mixers, and nonprofit/startup fairs that promote professional development across campus.

VandyHacks | *Executive Board Member, Senior Advisor*

Jan. 2022 – Present

- Executive board member on both the development and operations committees of VandyHacks, a student-run hackathon representing one of the largest engineering events at Vanderbilt.
- Organize logistics for the hackathon such as transportation, food, workshops, project presentation/judging, and recruitment.
- Develop technical infrastructure such as the public website/application portal and hacker management and judging systems.

Pi Mu Epsilon | *President*

Nov. 2022 – Present

- Lead recruitment efforts and host events to promote participation in math competitions, conferences, and research.

Tau Beta Pi | *President*

Oct. 2023 – Present

- Run chapter operations and organize events including induction, faculty mixers, and career/internship panels.

Vanderbilt CTF Club | *Competitor*

Aug. 2022 – Present

- Compete in CTF (capture the flag) competitions throughout the year, specializing in competitive programming and algorithmic design questions. Ranked both nationally and internationally as a team.
- Post write-ups for challenges solved during competitions in order to discuss solutions with the broader CTF community.

Code Ignite | *Team Lead & Curriculum Developer*

Sep. 2021 – May 2023

- Developed a 6-week Python programming curriculum for middle school students with no prior coding experience.
- Led a team of two other Vanderbilt students to teach the curriculum at a local Nashville middle school, fostering early exposure to coding and computational thinking.

Vanderbilt Student Volunteers for Science | *Volunteer Instructor*

Oct. 2021 – Mar. 2023

- Taught hands-on science lessons to middle school students in the Metro Nashville area, fostering interest in STEM through interactive experiments and demonstrations.

BhangraDores | *Competitor*

Sep. 2021 – May 2022

- Contributed to performances as part of Vanderbilt's competitive bhangra dance team, showcasing traditional Punjabi folk dance at cultural events/showcases and competitions.

SELECTED COURSEWORK

Mathematics: (Graduate) Real Analysis I & II, Topology I & II, Modern Algebra I & II, Functional Analysis, Harmonic Analysis, Operator Algebras, Number Theory. **(Undergraduate)** Probability & Mathematical Statistics, Advanced Linear Algebra, Complex Analysis.

Computer Science: (Graduate) Geometric Deep Learning, Advanced Machine Learning, Extended Mathematical Programming, Design & Analysis of Algorithms. **(Undergraduate)** Artificial Intelligence, Operating Systems, Programming Languages