

Curriculum Vitae/Resume

Gabriel Kosmacher

<https://github.com/kennykos>

Urbana, Illinois, United States

+1 773-986-0852

Education **University of Illinois at Urbana-Champaign**, Champaign, IL August 2019-Present
Bachelor of Science in Mathematics & Computer Science Graduation: May 2023
Minors: Computational Science and Engineering
GPA: overall 3.87/4.0
Dean's List: Fall 2019, Spring 2020, Fall 2020

Presentations *I know I'm Right, But Does my Phone?* (TRB 2023, NREL SULI 2022)
Seasonality and Immunity in Disease Dynamics. (UIC UMS 2022, UIUC URS 2022)
Toric and Semitoric Polygon Packing. (IGL Spring 2022, Fall 2021, Spring 2021)

Research **National Renewable Energy Laboratory** June 2022-August 2022
Experience Dr. K. Shankari

- Worked on *Evaluating The Interplay Between Trajectory Segmentation and Mode Inference Errors*
- **Introduced a framework** to evaluate accuracy of trip length computations and mode inference for continuous mode-segmented trajectories on groups of trips.
 - Developed a temporal alignment algorithm to classify temporal and spatial errors in a single metric and implemented the algorithm in python <https://github.com/kennykos/mobilitynet-analysis-scripts>
 - Applied the framework to the NREL OpenPATH pipeline using MobilityNet, a public dataset containing information from three *artificial timelines* that cover 15 different travel modes.
 - Evaluated travel data collected on smartphones on android and iOS operating systems that was post-processed by different machine learning algorithms.
 - **Results to be presented** at the Transportation Research Board Annual Meeting 2023.

University of Illinois Department of Mathematics Jan 2022-Present

Dr. Zoi Rapti

Worked on *Seasonality and Immunity in Disease Dynamics*

- **Co-designed and Co-developed a dynamical model** with another undergraduate student and Professor Rapti to investigate *Daphnia dentifera* disease dynamics.
- **Presented results** at the University of Illinois Chicago Undergraduate Mathematics Symposium 2022 and the University of Illinois Urbana-Campaign Undergraduate Research Symposium 2022.

Illinois Geometry Lab June 2021-May 2022

Dr. Joey Palmer

Worked on *Toric and Semitoric Packing Capacities*

- **Investigated packing capacities** with a team of undergraduate student and Professor Palmer to exactly compute packing capacities.
 - Developed an algorithm to explicitly compute toric packing capacities and implemented the algorithm in python https://github.com/CoulsonZhang/Semi-toric_Packing_Capacity.
 - Solved the equivariant semitoric perfect packing problem.
- **Co-authored a manuscript** currently in the journal submission process: <https://arxiv.org/abs/2210.06415>.
- **Presented results** at University of Illinois Urbana-Campaign Illinois Geometry Lab Poster Presentation Spring 2021, Fall 2022, Spring 2022.
- **Received** 2022 Illinois Geometry Lab Outstanding Research Award.

Grants/Awards 2022 Illinois Geometry Lab Outstanding Research Award
2021 Americorps Education Award – \$1,612.43
2020-21 Heery Scholarship Recipient – \$4,500

Work
Experience

University of Illinois Department of Computer Science
CS 450 Numerical Analysis Course Assistant

October 2022-Present

- **Graded** Mathematical & CS theory homework problems for an advanced undergraduate/graduate course.

National Renewable Energy Laboratory
Science Undergraduate Laboratory Internship

June 2022-August 2022

- Developed continuous mode-segmented trajectory framework (see research section above).
- Worked with a **team of 3 interns** on statistical methods for trajectory **error propagation**.
- Participated in numerous Department of Energy **professional development activities and workshops**.

University of Illinois Department of Mathematics
Mathematics and Statistics Student Support Center

August 2021-May 2022

- Hosted **drop in office hours** for all mathematics courses up to Calculus II.

Community
Involvement

Chicago Pre-College Science and Engineering Program
STEM Mentor

October 2022-Present

- Assisted in the teaching of a data-science curriculum at Kenwood Academy high school in Chicago for 11th and 12th graders.
- Developed a plant biology and environmental sustainability curriculum for 2nd graders which will be taught at the Urbana Neighborhood Connections Center.

Students for Environmental Concerns

January 2020-Present

Secretary (August 2021-May 2022), President (August 2022-Present)

- Lead an executive board of 10 undergraduates and an organization with 50+ general members.
- Oversee fundraising of \$500+ per academic semester.
- Develop and oversee various projects
 - **Develop and teach curriculum** regarding environmental ecology and sustainability to Urbana elementary school students.
 - Work with Facilities and Services to **implement a green-rooftop** on the engineering campus.
 - Run a **community garden** with a local non-profit.
 - Generate and publish independent **University of Illinois System Green Investment Report**.
 - Publish the Green Observer **Environmental Magazine**.
 - Implement **Illinois Climate Action Plan** objectives.

Illinois Student Government
Champaign County Board Liaison

August 2019-May 2020

- Served as Quorum member for the Student Government Department of Governmental Relations.
- Attended Champaign County Board meetings and engaged in discussion with council members to build and maintain healthy relations between the Illinois Student Government and Champaign County.
- Co-authored resolutions regarding criminal justice.