# Emil Jermann

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## EDUCATION

**University of Illinois Urbana-Champaign** Champaign, IL
*B.S. in Computer Science and Statistics, GPA 3.9/4.0* Graduated May 2026

## WORK EXPERIENCE

**Sandia National Laboratories** Albuquerque, NM
*Math & Analytics Intern* May 2025 - August 2025

- Built a geospatial analysis example for a data visualization course comparing precipitation patterns across ENSO phases, using NASA MERRA-2 precipitation data and NOAA's Nino 3.4 index in a Linux environment with Python, pandas, and geopandas.
- Validated LLM-generated parallel C++ code by designing test cases and benchmarking across two prompting strategies and models on Hugging Face, combining compile/runtime checks with text comparison metrics (ROUGE, codeBLEU) to evaluate correctness and code quality.
- Authored Jupyter notebook materials for data visualization course (100+ attendees in pilot session), demonstrating reproducible analysis workflows with plotnine and matplotlib.
- Communicated technical work clearly across multiple formats, delivered an academic paper presentation to 20+ staff and coauthored a technical paper on my findings.

**Sanders' Sustainable Systems Group at USC** Los Angeles, CA
*Research Assistant* May 2024 - August 2024

- Developed and trained PyTorch multilayer perceptron models to quantify the effect of demand-side solutions on marginal emissions factors for the California electricity grid.
- Evaluated models with R-squared and mean absolute error, and used feature-based binning to identify patterns in marginal emissions calculations.

**Campus Recreation, University of Illinois Urbana-Champaign** Champaign, IL
*Climbing Wall Instructor* April 2025 - Present

- Lead instructor in top-rope belay and climbing 101 clinics.
- Supervised top-rope and bouldering activities to ensure safety and adherence to facility rules

**Horizon Climbing** Champaign, IL
*Sales Staff* August 2025 - December 2025

- Instructed children ages 5-7 in climbing, creating a safe and engaging environment.

## PUBLICATIONS

- E. Jermann, N. Ellingwood, and C. M. Siefert. "Evaluation of LLM-Generated Kokkos Code using Compile-Time and Run-Time Testing." SAND Report No. SAND2025-14267O, Computer Science Research Institute Summer Proceedings 2025, Sandia National Laboratories, Albuquerque, NM & Livermore, CA (2025).

## PROJECTS

**CAISO Electrical Grid Data Analysis** January 2026 - April 2026

- Built Python data pipelines to fetch, clean, and reshape two years of hourly electricity data (fuel mix, demand, and CO2 emissions) from CAISO's public API endpoints using pandas, with retry logic and timezone-aware datetime handling.
- Wrote a data-driven narrative, designing a series of Tableau dashboards published on Tableau Public visualizing the growth of renewable energy and battery storage on California's electricity grid, illustrating trends in net demand, fuel mix composition, and CO2 emissions for 2019 and 2025.

**RoboTaxi (GEM e2)** August 2024 - May 2025

- Analyzed GPS and IMU sensor data with pandas and matplotlib to improve lane-following accuracy by >80% and reduce algorithmic failures by 50%.
- Designed diagnostic visualizations to identify failure cases and accelerate debugging of path planning algorithms.
- Developed a state machine for the GEM car for effective customer pickup and drop-off, using state changes defined by user input and YOLOv5n.

**Illinois Medlaunch Vision Swim** September 2023 - May 2024

- Designed and built a computer-vision assistive device to improve pool lane navigation for visually impaired swimmers, promoting inclusivity and accessibility in recreational fitness.
- Developed a data pipeline to transform raw ESP32-CAM images into structured luminance datasets, enabling quantitative feature extraction for pool lane detection.
- Applied OpenCV-based edge detection (Canny + Hough Line Transform with Gaussian blur preprocessing) to identify lane structures in noisy aquatic environments.
- Served as primary liaison with the community partner (a swimmer with glaucoma), building and maintaining the relationship through regular communication and ensuring technical progress aligned with his needs.

## VOLUNTEER EXPERIENCE

**Outdoor Adventure Club** Champaign, IL

*Philanthropy Chair* January 2024 - May 2025

- Initiated and built a long-term partnership with the Champaign County Forest Preserve District, arranging regular volunteer trips to Homer Lake Forest Preserve.
- Coordinated directly with park staff to secure equipment access and ensure compliance with regulations, safely guiding 30+ volunteers in habitat restoration.

**Youth Volunteer Corps Philadelphia** Philadelphia, PA

*Volunteer* March 2021 - May 2022

- Built and installed wooden signs for a community storybook trail to expand access to outdoor learning.
- Collaborated with a local artist to support a public art installation, strengthening community engagement.

## SKILLS & INTERESTS

**Programming Languages:** Python, R, C++, SQL, SAS, HTML, CSS.
**Programming Libraries:** PyTorch, Pandas, NumPy, Sklearn, Plotnine, GeoPandas, Seaborn, Pydantic, ggplot2, dplyr, tidyr.
**Tools:** VS Code, Tableau, Tableau Public, Visual Studio, RStudio, Arduino, Git, GitHub, Claude, Cursor, Copilot.
**Technical Skills:** Machine Learning (classification, regression, neural networks), Computer Vision, Statistical Modeling, Reinforcement Learning, Data Visualization, Data Storytelling, Feature Engineering, Software Development, Statistical Analysis.
**Certifications:** Wilderness First Aid, CPR/AED.