Benjamin Tarver

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Education

- *New York University* (NYU) - Doctor of Philosophy in Mechanical Engineering. Ph.D. anticipated in 2031.
- *University of California San Diego* (UCSD) - Bachelor of Science in Mechanical Engineering, Minor in Climate Change Studies. Graduated Magna Cum Laude in March 2025 (GPA: 3.98/4.00).
- Notable Coursework: Engineering Statistics, Experimental Techniques, Visualizing & Mapping Climate Changes with GIS, Physical Basis of Global Warming, Mathematical Physics, Computational Fluid Mechanics, Computational Methods in Engineering, Signals and Systems, Planning for Sustainable Communities, Environmental Racism, Democratizing the City, San Diego Community Research.

Work Experience

- *Research Assistant, Center for Energy Research* (La Jolla, CA; September 2022 - March 2025)
  - Developed automatic data collection pipeline using Python, Bash, and SQL to process, visualize, and publish live time series solar data to aid utility management.
  - Wrote, edited and created visualizations for particle-fluid dynamics research article.
  - Performed calculations and co-wrote a technical report in LaTeX to evaluate the solar water heating potential of UCSD dormitories, with findings used in the 2024 UCSD Decarbonization Study.
  - Tested and calibrated radiometers to quantify solar resources on the UCSD campus.
- *Research Intern, Swiss Federal Institute of Technology Lausanne* (Fribourg, CH; June - September 2024)
  - Processed and synthesized ten years of urban form, weather, and pedestrian data from 20+ sources.
  - Trained gradient-boosted tree machine learning models in Python to predict pedestrian behavior.
  - Leveraged game theory package in Python to investigate relative impacts of six categories of urban form features compared to miscellaneous factors on pedestrian activity in Melbourne city center.
  - Conducted frequency analysis of appliance power signatures to find acceptable sampling rates.
- *Laser Systems Engineering Intern, Lawrence Livermore Lab* (Livermore, CA; June - September 2023)
  - Developed scripts in Python to process and statistically analyze over 10 million damaged camera data points to correlate shutter speed and ambient temperature with image quality.
  - Designed experiment using heat transfer analysis and 3D modeling to determine if cold camera sensors accumulate significant radiation damage, with annual cost savings potential of >$200K.
- *Manufacturing Intern, Monarch Tractor* (Livermore, CA; June - September 2022)
  - Designed eight build fixtures using SOLIDWORKS for tractor system subassemblies.
  - Developed 2D drawings of fixtures in SOLIDWORKS to enable in-house part fabrication.
  - Researched and ordered components from online vendors to use in fixture prototypes.
  - Created ten mock wire harnesses in two days for tractor assembly trial runs.

Technical Projects

- *North Park Mobility Analysis Project* (San Diego, CA; January - March 2025)
  - Analyzed geographic distribution of essential services relative to residential buildings to characterize North Park neighborhood walkability using Python's GeoPandas and OSMnx.
  - Examined connectivity of bicycle infrastructure to illuminate safety gaps using OSMnx.
  - Conducted site visits to understand active mobility user experiences with current infrastructure.
  - Led question ideation and dissemination of survey asking neighborhood residents to qualitatively and quantitatively describe mobility infrastructure quality.
  - Co-wrote ~50 page report detailing past, present, and future of North Park mobility infrastructure.
- *Endoscopic Multiload Clip Applier Project* (La Jolla, CA; October 2024 - March 2025)
  - Designed pulley and reloadable cartridge mechanism subcomponents of robotically controlled blood vessel crimping device in SolidWorks.
  - Conducted numerical analyses of design component failure modes using MATLAB and Ansys.
  - Designed, conducted, and analyzed three physical experiments assessing prototype performance.
  - Led creation of ~60 page technical report for key stakeholders detailing project work performed.
  - Crafted and delivered five presentations to stakeholders detailing progress throughout the project.

Publications

- Kanaha Shoji, **Benjamin Tarver**, Andrew Sonta; Data-driven insights on urban walkability: Modeling the relationships between urban form and pedestrian activity. Submitted to *Cities: The International Journal of Urban Policy and Planning*. Preprint: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5290810.
- Omar AlAli, **Benjamin Tarver**, Carlos F. M. Coimbra; Particle response to oscillatory flows at finite Reynolds numbers. *Physics of Fluids* 1 October 2024; 36 (10): 103367. https://doi.org/10.1063/5.0229970.

Posters

- Kanaha Shoji, **Benjamin Tarver**, Andrew Sonta; Beyond theories of walkability: Using data to identify city-specific patterns and shared principles linking urban form and pedestrian mobility. Presented at the 19th International Conference on Computational Urban Planning and Urban Management, London, UK.

Skills

- Deploying statistical tools and machine learning models to illuminate patterns in large datasets, especially using Python's NumPy, pandas, and scikit-learn libraries.
- Creating automated data preparation, analysis, and visualization pipelines in Linux using SQL and Grafana.
- Processing geospatial datasets using Python's GeoPandas, Shapely, and OSMNx libraries.
- Conducting literature reviews and synthesizing information from multidisciplinary academic journals.
- Technical writing and creating visualizations for research articles across multiple disciplines.
- Communicating actionable information across stakeholder groups with various levels of expertise.

Volunteer Experience

- *Che Café and Dollar Lunch Club Meal Preparation* (May 2024 - April 2025)
  - Assisted weekly in preparing free meals for underserved populations in San Diego.
- *GENup Nationwide Director of Communications* (August 2020 - June 2022)
  - Wrote and edited opinion-editorials, newsletters, blog posts, press releases, and media advisories to inform the public about GENup's work promoting progressive education policy in California.
- *FESCO Banyan House Volunteer* (March 2019 - March 2020)
  - Built enriching relationships with children in transitional housing through art projects and play.
  - Tutored children in elementary-level mathematics and English Language Arts.

Awards

- *Department of Mechanical and Aerospace Engineering Undergraduate Student Award of Excellence* (2025)
  - Awarded to three students out of 260-person graduating class in the UC San Diego Department of Mechanical and Aerospace Engineering for outstanding achievements in academic, extracurricular, and occupational activities.
- *Excellence Research Internship Program Scholarship* (2024)
  - Awarded monthly stipend of 1,600 CHF for three months of research activity at EPFL.
- *UC San Diego IDEA Scholar* (2021)
  - Awarded $1,000 for writing an essay about my commitment to improving inclusion and diversity in engineering and attending a summer engineering educational program.

Media

- *Lawrence Livermore Lab Internship Highlight in UCSD Today* (October 2023): today.ucsd.edu/story/5-summer-internships-that-made-a-real-impact
- *Civic Engagement Opinion-Editorial in Capitol Weekly* (January 2021): capitolweekly.net/needed-educational-training-in-civic-engagement

Websites

- *Personal Website: benjamint8.github.io*