

Richard Randall

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Education

Ph.D. Mechanical Engineering | December 2025 | Stanford University

- Thesis title: *Photochemical Processes for Dilute Methane Oxidation and Atmospheric Methane Removal*
- Advisor: Prof. Arun Majumdar

M.S. Mechanical Engineering | June 2022 | Stanford University (GPA 4.07/4.3)

- Coursework depths in thermodynamic modeling (ME370A-C), mechatronics (ME218AB), and design for manufacturing

B.S. Mechanical Engineering | June 2019 | Stanford University (GPA 4.03/4.3)

- Capstones *Advanced Thermal Systems* and *Design for Extreme Affordability*; Minor in History

Research Experience

Majumdar Lab | Stanford Dept. of Mechanical Engineering | 2020-25 as PhD Student; 2026- as Postdoctoral Fellow

- Developed and tested chemical processes to destroy low-concentration methane for climate change abatement.
- Experimentally studied methane oxidation via heterogeneous photocatalysis and also via gas-phase advanced oxidation
- Conducted cost modeling of each of the above systems in order to evaluate their real-world scalability
- Designed, built, and programmed several automated reactor setups for catalytic process development.
- Wrote and released 'PyOpticon,' a Python-based open-source lab automation and data acquisition package.
- 4 peer-reviewed 1st-author papers published or currently under review; 4 other 3rd-or-later-author papers in print.

Industry and Other Experience

Teaching Assistant | Stanford Product Realization Lab | 2023-25 (part-time)

- Helped to teach 'ME325: Injection Molding' class in Stanford's educational machine shop
- Lectured on design for machinability and moldability; coached students one-on-one and in small groups

Prototype Engineer | Holocene Climate | 2021-2022 (part-time)

- Designed, built, and operated a benchtop liquid-sorbent direct air capture device for a Stanford-affiliated CDR startup
- Performed process and techno-economic modeling of a novel CO₂ 'direct air capture' chemistry
- Contributed to successful applications for the Student Carbon Removal XPrize and Dept. of Energy research funds.

Policy Research Intern | Energy Futures Initiative | 2019 – 2020

- Researched and wrote policy-oriented reports related to CCS, low-carbon grid reliability, and Californian energy policy.

Schultz Energy Fellow | California Air Resources Board | Summer 2019

- Conducted research on other countries' policies promoting production, sales, and use of zero-emission vehicles.

Mechanical Engineering Intern | Wrightspeed | Summer 2018

- Designed power electronics enclosures for Wrightspeed's hybrid bus drivetrains. Produced engineering drawings and interfaced with vendors. Assisted with testing of Wrightspeed's proprietary range-extending turbine

Skills

- Manual and CNC machining, laser cutting, and 3D printing. CAD, fixture design, and design for manufacturing.
- Coding in Python, MATLAB, R, and C++. Embedded C on PIC32, Arduino. Thermal systems modeling using Cantera.

Awards and Achievements

- National Science Foundation Graduate Research Fellow, 2021-2024
- Finalist for Hertz Fellowship, 2021