Omkar Lonkar

Curriculum Vitae

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Research Interests

Green computing, sustainable systems, energy efficiency; computer architecture, reconfigurable and flexible systems, hardware design; instruction set architecture, ISA extensions; algorithms, graph algorithms.

Teaching Interests

Computer architecture, instruction set architecture, assembly language, logic design.

Education

University of California, Santa Cruz August 2023 – Present

- Doctor of Philosophy in Computer Science and Engineering
- Master of Science in Computer Science and Engineering

University of California, Santa Barbara August 2019 – June 2023

- Bachelor of Science, *cum laude*, in Computer Engineering

Professional Appointments

Graduate Student Researcher, University of California, Santa Cruz August 2023 – Present

- **UCSC Sustainable Systems Lab and UCSC SusLab**
  - Exploring the viability of on-chip reconfigurability to provide hardware support for newly rolled out datatypes and ISA extensions and extend the lifetime of datacenter hardware.
  - Creating a simulator to model the total cost of power, energy and carbon for datacenters given historical workload traces to guide datacenter rightsizing.
- **UCSC VAMA**
  - Designed an implementation of the distributed memory graph triangle counting algorithm that reduces communication volume, local computation overhead and improves algorithmic runtime on various input graphs [U1, R1].

Teaching Assistant, University of California, Santa Cruz March 2024 – Present

- Assisting in teaching of undegraduate-level courses in the Department of Computer Science and Engineering.

Science Internship Program Mentor, University of California, Santa Cruz June 2026 – Present

- Mentoring high school students in conducting research in computer architecture.
- Developing an instruction set architecture and processor implementation to be used in computer architecture courses at UC Santa Cruz.

Software Engineering Intern, Siemens EDA June 2022 – September 2022

- Worked on the development of runtime systems on the Veloce Prototyping System (VPS), allowing the open source manycore processor OpenPiton to be used with VPS.

Undergraduate Research Experience

UCSB ArchLab June 2021 – June 2023

- Assisted in the benchmarking of Cohort, a system that exploits the behavior of shared-memory queues to efficiently connect producers and consumers in software with hardware accelerators [C1].
- Worked towards developing a research tool to allow to create and compare implementations of branch predictors.

Fellowships

2023–2024 University of California Regents Fellowship

2023–2024 Computer Science and Engineering Department Fellowship, UC Santa Cruz

Honors and Awards

2023 *Cum Laude*, University of California, Santa Barbara

2021 Tau Beta Pi Honor Society Inductee, University of California, Santa Barbara Chapter

2020–2023 College of Engineering Honors Program, University of California, Santa Barbara

2019–2023 Dean's List, University of California, Santa Barbara

Teaching

Courses Assisted

CSE 120: Computer Architecture, UC Santa Cruz Sp'24, Wi'25, Wi'26, Sp'26

- Developing PyRTL-based labs for upper division Bachelors-level Computer Architecture course.
- Taught discussion sections; assisted in creating exams, assignments and practice problem sets; and graded coursework.

CSE 20: Introduction to Python, UC Santa Cruz Fa'25

- Assisted in creating Jupyter-based assignments, taught discussion sections, and graded exams.

Students Supervised & Mentored

Legend: ▽ bachelor's/master's research; ⋆ UCSC SIP.

Current Mentees

Name	Years	Degree, Institution	Employer
Bronsen Lasala ▽ [P1]	2026–	B.S., UC Santa Cruz (in progress)	
Jeanelle Dao ⋆	2026–	Presentation High School (in progress)	
Orion Ghai ⋆	2026–	Los Gatos High School (in progress)	
Harshita Vohra ⋆	2026–	Irvington High School (in progress)	

Scholarly and Creative Work

Conference Publications (Peer Reviewed)

[C1] Tianrui Wei, Nazerke Turtayeva, Marcelo Orenes-Vera, Omkar Lonkar, and Jonathan Balkind. 2023. Cohort: Software-Oriented Acceleration for Heterogeneous SoCs. In Proceedings of the 28th ACM International Conference on Architectural Support for Programming Languages and Operating Systems, Volume 3 (ASPLOS 2023). Association for Computing Machinery, New York, NY, USA, 105–117. https://doi.org/10.1145/3582016.3582059

Preprints

[U1] O. Lonkar, and S. Beamer. "Accelerating Distributed Memory Triangle Counting Using Bloom Filters."

Technical Reports

[R1] O. Lonkar. Accelerating Distributed Memory Triangle Counting Using Bloom Filters. UC Santa Cruz, 2025.

Conference, Workshop, and Center Presentations

[P1] Modeling Power Usage in Data Centers. CRSS IAB Meeting, 2026.