Nandeeka Nayak

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GRADUATE EDUCATION

University of California, Berkeley — Jan 2024 - May 2026
Computer Science, Ph.D.
Advisor: Christopher W. Fletcher
GPA: 4.0

University of Illinois Urbana-Champaign — Aug 2020 - Dec 2023
Computer Science, Ph.D.
Advisor: Christopher W. Fletcher
GPA: 4.0

Relevant Coursework

Computer Science: Manycore Parallel Algorithms, Languages and Compilers for Edge Computing, Applied Parallel Programming, Parallel Computer Architectures, Advanced Compiler Construction, Computer Systems Organization, Advanced Computer Security
Korean: Advanced Korean II, Advanced Korean I, Intermediate Korean II
Audited: Numerical Analysis

UNDERGRADUATE EDUCATION

Harvey Mudd College, Claremont, CA — Aug 2016 - May 2020
Computer Science, B.S.
GPA: 3.96

Relevant Coursework

Computer Science Clinic, Algorithms, Compiler Design, Programming Languages, Artificial Intelligence, Operating Systems, Software Development, Computer Security, Computability and Logic, Computer Systems, Data Structures/Program Development, Quantum Information, Advanced Computational Biology, Discrete Mathematics, Linear Algebra, Differential Equations, Multivariable Calculus
Audited: Stanford's Convolutional Neural Networks for Visual Recognition

HIGH SCHOOL EDUCATION

Henry M. Gunn High School, Palo Alto, CA — Aug 2012 - Jun 2016
High School Diploma
GPA: 4.0; Weighted GPA: 4.49

PUBLICATIONS

Nandeeka Nayak, Xinrui Wu, Toluwanimi O. Odemuyiwa, Michael Pellauer, and Christopher W. Emer Joel S.and Fletcher. "FuseMax: Leveraging Extended Einsums to Optimize Attention Accelerator Design". In: submission.

Nandeeka Nayak, Toluwanimi O. Odemuyiwa, Shubham Ugare, Christopher W. Fletcher, Michael Pellauer, and Joel S. Emer. "TeAAL: A Declarative Framework for Modeling Sparse Tensor Accelerators". In: MICRO '23. IEEE Micro Top Picks 2023 Honorable Mention.

Jose Rodrigo Sanchez Vicarte, Pradyumna Shome, **Nandeeka Nayak**, Caroline Trippel, Adam Morrison, David Kohlbrenner, and Christopher W. Fletcher. "Opening Pandora's Box: A Systematic Study of New Ways Microarchitecture Can Leak Private Data". In: ISCA '21. Intel Hardware Security Academic Award 2022 Honorable Mention.

Nandeeka Nayak, Makoto Nara, Timmy Gambin, Zoë Wood, and Christopher M. Clark. "Machine Learning Techniques for AUV Side-Scan Sonar Data Feature Extraction as Applied to Intelligent Search for Underwater Archaeological Sites". In: FSR '19.

TALKS

Extended Einsums: Domain-Specific Kernels in the Language of Tensor Algebra. Stanford AHA Seminar 2024. `https://aha.stanford.edu/`

TeAAL: A Declarative Framework for Modeling Sparse Tensor Accelerators. Workshop on Sparse Tensor Computations 2023. `https://solomonik.cs.illinois.edu/tensor_workshop/index.html`.

TeAAL: A Declarative Framework for Modeling Sparse Tensor Accelerators. CTSTA 2023. `https://pldi23.sigplan.org/home/ctsta-2023`.

TeAAL: A Declarative Framework for Modeling Sparse Tensor Accelerators. DRAGSTERS 2023. `https://pldi23.sigplan.org/home/dragsters-2023`.

AWARDS AND ACHIEVEMENTS

IEEE Micro Top Picks Honorable Mention	2023
Intel Hardware Security Academic Award Honorable Mention	2022
SURGE Fellowship	2020-2025
Computer Science Departmental Honors (Harvey Mudd College)	2020
Graduate with High Distinction (Harvey Mudd College)	2020
NSF Graduate Research Fellowship Program Honorable Mention	2020
Wing and Ellen Tam Award for Excellence in Software Development	2019
Harvey Mudd Merit Scholarship	2016-2020
National Merit Scholarship Finalist	2016
NCWIT Award for Aspirations in Computing Certificate of Distinction Winner	2016
NCWIT Award for Aspirations in Computing National Runner-Up and Affiliate Award Winner	2015
Girl Scout Gold Award Recipient	2015

POSITIONS

Teaching Assistant, CS 173: Discrete Structures, UIUC, Urbana, IL — Aug 2023 - present

- Help students with working on problems during class, office hours, and online over Piazza
- Grade the exams together with the other TAs

Research Intern, NVIDIA, Westford, MA — May 2022 - Aug 2022

- Worked with domain experts in machine learning, tensor methods, and quantum circuit simulation to understand their workloads
- Designed a novel resource allocation heuristic for workloads with fused kernels
- Achieved a $> 25\times$ speedup over standard fully connected layers neural network using hardware-aware tensor decomposition

Member of Technical Staff Intern, Qumulo, Seattle, WA — May 2020 - Jul 2020

- Designed and implemented the infrastructure to support flow controlling on the length of the write-ahead log (WAL) in Qumulo's distributed file system
- Investigated the root cause of both performance issues observed internally and those experienced by customers
- Rewrote parts of the block system in Rust and integrated it with the existing C code base

Machine Learning Intern, Miso Robotics, Pasadena, CA — May 2019 - Aug 2019

- Performed semantic segmentation using convolutional neural networks on images of pizzas to describe the specific locations of toppings, the crust, and background
- Used the generated masks to localize the pizza in real space as well as describe how it could be improved
- Helped to implement a ROS node to pass the information to the robot and perform localization and error correction

Researcher, Lab for Autonomous and Intelligent Robotics, Harvey Mudd College Nov 2017 - May 2020

- Planned missions to survey new regions of the sea floor using the OceanServer IVER3 AUV
- Used data augmentation and convolutional neural networks with OpenCV and Tensorflow to automatically identify shipwrecks from side scan sonar images
- Wrote a paper on a new automatic target recognition pipeline and presented it at Field and Service Robotics (FSR) 2019

Teaching Assistant, Edhesive, New York, NY Aug 2016 - May 2020

- Tutored students from hundreds of schools in 47 states and 11 countries online in Introduction to Computer Science and AP Computer Science Principles
- Explained specific concepts to students, help debug code, and provide technical support
- Helped with curriculum development including proof-reading exams, rewriting test questions, and creating solution manuals

Identity and Access Management Intern, Visa, Foster City, CA May 2017 - Aug 2017

- Configured ForgeRock's OpenAM to manage access to a web application
- Used new authentication mechanisms, like OATH and PIV, to demonstrate strong second-factor authentication
- Built a web application with AngularJS on the front-end and Java on the back-end

Creator and Organizer, Programming Camps, San Jose, CA (goo.gl/0ZDTbE) Feb 2014 - Jul 2016

- Organized 5 free, weeklong programming camps for underrepresented students
- Designed the curriculum in MIT App Inventor and led a group of over 100 volunteers to teach it
- Earned the Girl Scout Gold Award

Programming Director and Member, Space Cookies, Mountain View, CA Aug 2012 - Jul 2016

- Participated in FIRST Robotics Competition in the fabrication and programming teams for 4 years
- Served on the leadership team for 2 years
- Redesigned the team's programming teaching curriculum and tripled the size of the programming team

Teaching Assistant, AP Computer Science, Gunn High School, Palo Alto, CA Aug 2015 - Jun 2016

- Worked with students who needed extra support
- Helped develop the next year's curriculum by writing a potential final project

STUDENTS MENTORED

Yuxin Jin (Mar 2024 - present)
Chenxi Wan (Mar 2024 - present)
Xinrui (Alice) Wu (May 2023 - present)
Timor Averbuch (May 2023 - present)
Jules Peyrat (Apr 2024 - Aug 2024)
Alex Dicheva (Aug 2022 - Oct 2023)

SERVICE

Organizer: Women in Architecture Dinner (Berkeley) (Jul 2024 - present), Women in Architecture Coffee Hour (UIUC) (Jan 2022 - Dec 2023), Middle School Programming Camps (see above) (Feb 2014 - Jul 2016)
Volunteer: Visit Day Grad Ambassador (Mar 2022, Mar 2023), Grad Welcome Event Volunteer (Sep 2022), iPromise Mentor (Aug 2020 - May 2021)