Vishal Canumalla

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vishal-canumalla

Research Interests

- Programming Languages
- Formal Methods
- Compilers
- Program Synthesis

Education

2020–2024 **Bachelor's of Computer Science**, University of Washington, Seattle.

Employment

2021–present **Undergraduate Researcher**, *University of Washington*, Seattle, WA.
Advisor: Zachary Tatlock

Summer 2022 **Software Engineering Intern**, *Toyota Connected North America*, Plano, TX.

Spring 2022 **Research Intern**, *Certora*, Seattle, WA.
Advisor: Chandrakana Nandi

Publications

To Appear **FPGA Technology Mapping Using Sketch-Guided Program Synthesis**
Gus Henry Smith, Ben Kushigian, Vishal Canumalla, Andrew Cheung, Steven Lyubomirsky, Sorawee Porncharoenwase, René Just, Gilbert Bernstein, Zachary Tatlock.
Conditionally Accepted to ASPLOS 2024

TODAES 2023 **Application-Level Validation of Accelerator Designs Using a Formal Software/Hardware Interface**
Bo-Yuan Huang, Steven Lyubomirsky, Yi Li, Mike He, Thierry Tambe, Gus Henry Smith, Akash Gaonkar, Vishal Canumalla, Andrew Cheung, Gu-Yeon Wei, Aarti Gupta, Zachary Tatlock, Sharad Malik.

ICFP SRC 2023 **Application of Sketch Guided Synthesis to Runtime Reconfigurable FPGA Primitives**
Vishal Canumalla
3rd Place in Undergraduate Division

PLARCH 2023 **Generate Compilers from Hardware Models!**
Gus Henry Smith, Ben Kushigian, Vishal Canumalla, Andrew Cheung, Zachary Tatlock.

Presentations and Posters

Nov. 2023 **FPGA Technology Mapping Using Sketch-Guided Program Synthesis**
Allen School Annual Affiliate Research Showcase.

Sept. 2023 **Application of Sketch Guided Synthesis to Runtime Reconfigurable FPGA Primitives**
ICFP Student Research Competition.

May 2023 **FPGA Synthesis via Program Synthesis**
Allen School Undergraduate Research Showcase.

April 2023 **Application-Level Validation of Accelerator Designs**
UW PLSE Lightning Talks.

Nov. 2022 **Specialized Accelerators: Addressing the Mapping Gap**
Allen School Annual Affiliate Research Showcase.

Research Projects

Lakeroad Applying program synthesis to the problem of FPGA technology-mapping.

3LA Developing a formal hardware/software interface for end-to-end testing of accelerator designs.

Gambit Applying mutation testing to formal verification of smart contracts. Developed prototype mutations on Solidity AST nodes, finding common bugs across developer smart contracts.

Glenside Contributor to Glenside, an open-source pure tensor program representation.

Awards

2023 3rd Place in Undergraduate Division, ICFP Student Research Competition

2022 ACM PacNW Div. 2 State Champions

2019 U.S. National Chemistry Olympiad Semifinalist

Coursework

- Graduate Programming Languages
- Algorithms
- Distributed Systems
- Computer Aided Reasoning
- Programming Languages
- Systems Programming