

Bharath Namboothiry

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EDUCATION

Stanford University

M.S. in Computer Science with Specialization in Theory | *GPA: 4.00*

B.S. in Mathematics with Minor in South Asian Studies | *GPA: 3.97*

Stanford, CA

Class of 2024

- **Relevant CS Courses:** Complexity Theory I/II, Machine Learning, Blockchain Technologies, Probabilistic Analysis, Advanced Topics in Cryptography, Computer and Network Security, Optimization and Algorithmic Paradigms, CS Core Classes
- **Relevant Math Courses:** Groups and Rings, Real Analysis, Complex Analysis, Probability Theory, Graph Theory, Number Theory
- **Programming Languages:** Rust, Python, C, C++, JavaScript, LaTeX
- **Extracurricular Leadership:** Residential Advisor (RA), Calculus Tutor, Stanford Bhangra Music Director, Blyth Fund Pitch Lead

RESEARCH EXPERIENCE AND PROJECTS

Proof of Fairness

July 2023 – Present

- Working towards a proof of fairness, which reveals if a given model passes a pre-decided disparate impact threshold.
- Building a zero-knowledge layer around IBM Watson OpenScale, which can test fairness metrics post-hoc.

n-Party Private Function Commitments

June 2022 – Present

- Formulated a new class of multiparty computation problems, where collaborating parties hold secret portions of a joint algorithm.
- Engineered two functional commitment schemes for this class of problems, each with proofs of functional relation (PRFs)
- Implementing project in the arkworks Rust ecosystem, in preparation for Asiacypt 2024.

Revealable Functional Commitments

June 2022 – June 2023

- Developed new primitives to functional commitment schemes, enabling partial reveals of private committed functions.
- Expanded the state-of-art, allowing function privacy to be dynamically adjusted with zero-knowledge guarantees.
- Submitted to CT-RSA 2024 (pending decision, preprint available [here](#)).

Hardness of Picking a Winner

June 2021 – Sept 2021

- Defined the algorithmic problem of ‘picking a winner’ on tournament graphs in various domain-specific distributions.
- Proved results on the complexity of identifying Slater winners and approximating Markov winners in random graphs.

Adaptive Predictive Sets with Class Conditional Coverage

March 2021 – June 2021

- Built a distribution, free method to generate a predictive set with class-conditional coverage guarantee from any black-box classifier.
- Implemented algorithm in Python and tested with classical ML classifiers and modern DNNs (code and writeup are available [here](#)).

Classify – Medical Drone Imaging (Hackathon)

February 2020

- Developed a Swift-based computer vision application leveraging drone imagery to identify yellow fever cases in isolated terrains.
- Engineered and showcased real-time drone technology demonstration, successfully advancing through all judging rounds.
- Honored with the "Samsung Hack Award" at Stanford TreeHacks 2020 for outstanding innovation and application impact.

PROFESSIONAL EXPERIENCE

Intel Labs

Santa Clara, CA

Graduate Research Intern - Cryptography

Jan 2024 - Present

- Collaborating on DARPA’s HARDEN initiative to enhance the security of integrated computing systems via lightweight crypto.
- Furthering Cryptographic Capability Computing (C3), which optimizes vulnerable metadata with partially-encrypted pointers

Stanford Theory Group

Stanford, CA

Researcher, Applied Cryptography Group

June 2021 – Present

- Researched under the advisements of Profs. Dan Boneh, Li-Yang Tan, and Moses Charikar.
- Led collaborative and solo research projects in ZK proof systems, multiparty compute, graph theory and complexity theory.

Stanford School of Engineering

Stanford, CA

Course Assistant

Sept 2022 – Dec 2023

- Mentored and instructed a total of 1000+ students in cryptography, blockchain, and algorithms courses using C++, JS, and Solidity.
- Managed teams of 15+ staff to prepare, evaluate, and revise course material, homework, and exams.
- Developed and shared solutions to close the gap between student needs and instruction in theoretical computer science.

Intel Corporation

Hillsboro, OR

Platforms and Systems Intern

June 2020 – Sept 2020

- Led the thermal characterization of mobile PC platforms as an effort bottleneck problem, in collaboration with senior engineers.
- Automated a DOE system for thermal engineers using Python and FloScript, reducing experiment times from 2 days to 10 minutes.

Lighthaven Capital Management

San Francisco, CA

SWE & Equity Research Intern

Jan 2020 – Sept 2020

- Directed a team of university interns involved in fundamental stock research, in-depth equity evaluation and technical analysis.
- Built Python-based web tools that accelerated stock screening and instantly visualized Lighthaven’s unique research pipeline.