Karthik Garimella

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www.kvgarimella.github.io
Google Scholar
GitHub

Education

2020–Present **PhD, New York University**
Electrical and Computer Engineering.
- GPA: 3.84/4
- Advisor: Brandon Reagen
- Multi-Party computation and homomorphic encryption for secure neural network inference
- Security and privacy of machine learning models

2018–2020 **MSc, Washington University in St. Louis**
Computer Engineering.
- GPA: 3.78/4
- Advisor: Xuan Silvia Zhang
- Adversarial machine learning in autonomous vehicles

2013–2017 **BA, Hendrix College**
Major Physics, Minor Computer Science.
- GPA: 3.97/4

Experience

Summer 2024 **NVIDIA Research**.
Research Intern on the Programming Systems team working on Fully Homomorphic Encryption

Summer 2019 **NASA Jet Propulsion Laboratory**.
Software Intern with the Physical Oceanography Distributed Active Archive Center (DAAC)

Fall 2017 - Summer 2018 **Oak Ridge National Laboratory**.
Scientific Software Developer for the Climate Change Science Institute and the ORNL DAAC

Summer 2017 **NASA Goddard Space Flight Center**.
Data Science Intern with the Goddard Earth Sciences Data and Information Services Center

Publications

For a full list of publications, please refer to my Google Scholar Profile.

2025 Orion: A Fully Homomorphic Encryption Framework for Deep Learning
Architectural Support for Programming Languages and Operating Systems (ASPLOS)
Austin Ebel, **Karthik Garimella**, Brandon Reagen
(arxiv) (code)

2023 Characterizing and Optimizing End-to-End Systems for Private Inference
Architectural Support for Programming Languages and Operating Systems (ASPLOS)
Karthik Garimella, Zahra Ghodsi, Nandan Kumar Jha, Siddharth Garg, Brandon Reagen
(arxiv) (code)

2021 Cryptonite: Revealing the Pitfalls of End-to-End Private Inferece at Scale
arXiv preprint
Karthik Garimella, Nandan Kumar Jha, Zahra Ghodsi, Siddharth Garg, Brandon Reagen
(arxiv)

2021 A Cautionary Tale of Using Low-Degree Polynomial Activations in Privacy-Preserving Deep Learning
ACM Conference on Computer and Communications Security (ACM CCS) PPML Workshop
Karthik Garimella, Nandan Kumar Jha, Brandon Reagen
(arxiv) (code)

2021 F-LEMMA: Fast Learning-based Energy Management for Multi-/Many-core Processors
IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)
An Zou, Yehan Ma, **Karthik Garimella**, Benjamin Lee, Christopher D. Gill, Xuan Zhang
(ieeexplore)

2020 Attacking Vision-Based Perception in End-to-End Autonomous Driving Models
Journal of Systems Architecture (JSA)
Adith Boloor, **Karthik Garimella**, Xin He, Christopher Gill, Yevgeniy Vorobeychik, Xuan Zhang
(arxiv) (code)

Teaching

Fall 2023 **New York University**
Head Teaching Assistant for Computing Systems Architecture (ECE-GY 6913).

Spring 2023 **New York University**,
Head Teaching Assistant for Deep Learning (CS-GY 6953 / ECE-GY 7123).

Spring 2019 **Washington University in St. Louis**
Tutor for Introduction to Machine Learning (CSE 417T).

2015 - 2016 **Hendrix College**
Lead Teaching Assistant for General Physics I and II (PHYS 235/245).

Talks

2023 **MIT CSAIL Security Seminar**
Characterizing and Optimizing End-to-End Private Inference.

2023 **UC Berkeley - Raluca Ada Popa's Group**
Characterizing and Optimizing End-to-End Private Inference.

2023 **Princeton - Computer Architecture Day**
Characterizing and Optimizing End-to-End Private Inference.

2022 **Applications Driving Architecture**
Characterizing and Optimizing End-to-End Private Inference.

2022 **TechCon**
Characterization of End-to-End Private Inference at Scale.

2021 **ACM CCS Privacy-Preserving Machine Learning Workshop**
A Cautionary Tale of Using Low-Degree Polynomial Activations in Privacy-Preserving Deep Learning.

2019 **Conference on Computer Vision and Pattern Recognition (CVPR) (invited)**
CARLA Autonomous Driving Challenge - Third Place Presentation.

Service and Outreach

2024 NYU Computer Architecture Day - Lead Organizer (~ 80 attendees)

2023 CADathlon@ICCAD - Topic Chair

Honors and Awards

2024 MLCommons Rising Star

2022-2024 GAANN PhD Fellow – New York University, Department of Education

2020 Dean's PhD Fellowship – New York University

2019 Third Place at the CVPR 2019 Autonomous Driving Challenge

2013-2017 All-Tournament, All-Sportsmanship Team Honors, ITA Scholar, Captain - Hendrix College Varsity Tennis

Skills

Languages	Python, C/C++, Rust, Go
Tools	PyTorch, Numpy, Matplotlib, LaTeX, git, shell
Relevant Coursework	Probability, Machine Learning, Deep Learning, Bayesian Machine Learning, Computer Vision, Algorithms, Programming Languages, Computer Architecture, OS, Cryptography