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## I Education

PhD student, Computer Science, Georgia Institute of Technology, 2021-Present.

Research area: Software-Hardware Codesign for Next Generation Linear Algebra Libraries

Advisor: [Richard Vuduc](#)

M.S., Computer Science, Georgia Institute of Technology, 2019-2021.

NOTE: Matriculated into a PhD program.

Advisor: [Richard Vuduc](#)

B.S. cum Laude, Computer Engineering, Boston University, 2019.

## II Employment History

- July 2022-present **NVIDIA**, Compute Architect.  
Role: Lead designer for CUTLASS 3 and PIC for CUDA C++ Programming Model exposure of tensor cores.
- Jan-July 2022 **NVIDIA Research**, Intern, Programming Systems and Applications group.  
Role: Hardware acceleration and software algorithms for spGEMM acceleration.
- Jan-Aug 2021 **NVIDIA**, Deep Learning Compute Architecture Intern.  
Role: Lead designer for CUTLASS 3.0 prototype and PTX/CUDA C++ exposure of Hopper tensor core features.
- Summer 2020 **Cerebras Systems**, Parallel and distributed algorithms intern.  
Role: High performance compute kernels (fast kernels) team.
- 2020-present **HPC Garage Lab**, GTA and GRA, Georgia Institute of Technology.
- Summer 2019 **Arm Holdings**, Software engineering Intern.  
Role: Cycle accurate models compiler team.
- Summer 2018 **Bloomberg L.P.**, Software Engineering Intern.

- 2016-2019 **Undergraduate Researcher** in deep learning, advisor: Brian Kulis.
- 2016-2018 **Boston University College of Engineering** Teaching Assistant for various engineering courses.

### III Honors and Awards

- November 2022 **Gordon Bell Prize Finalist**, ACM/IEEE Conf. Supercomputing 2022 (SC22).
- November 2020 **Gordon Bell Prize Finalist**, ACM/IEEE Conf. Supercomputing 2020 (SC20).
- November 2020 **3rd Place, Virtual Student Cluster Competition**, ACM/IEEE Conf. Supercomputing 2020 (SC20).
- May 2020 **Daniel V. Jackson Fellowship**, College of Computational Science and Engineering, Georgia Tech.
- May 2019 **Undergraduate Student Service Award**, Boston University College Of Engineering.
- 2016-2019 **Dean's List**, 7x awardee, Boston University College of Engineering.

### IV Research

For citation counts per web-based indices, see

<https://scholar.google.com/citations?user=XTVUpYcAAAAJ>

#### IV-A Conference Presentations with Proceedings

- [P1] R. Kannan, P. Sao, H. Lu, J. Kurzak, G. Schenk, Y. Shi, S.-H. Lim, S. Israni, **Vijay Thakkar**, G. Cong, R. Patton, S. E. Baranzini, R. Vuduc, and T. Potok, "Exaflops biomedical knowledge graph analytics," in *Proceedings of the ACM/IEEE International Conference for High-Performance Computing, Networking, Storage, and Analysis ("Supercomputing" or SC)*, Dallas, TX, USA, Nov. 2022. **Finalist, Gordon Bell Prize**
- [P2] P. Sao, H. Lu, R. Kannan, **Vijay Thakkar**, R. Vuduc, and T. Potok, "Scalable all-pairs shortest paths for huge graphs on multi-GPU clusters," in *Proceedings of the 30th International Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, Stockholm, Sweden: ACM, Jun. 2021. [19%]
- [P3] R. Kannan, P. Sao, H. Lu, D. Herrmannova, **Vijay Thakkar**, R. Patton, T. E. Potok, and R. Vuduc, "Scalable knowledge-graph analytics at 136 petaflop/s," in *Proceedings of the ACM/IEEE International Conference for High-Performance Computing, Networking, Storage, and Analysis ("Supercomputing" or SC)*, Atlanta, GA, USA, Nov. 2020. **Finalist, Gordon Bell Prize**
- [P4] **Vijay Thakkar**, R. Manzelli, A. Siahkamari, and B. Kulis, "Conditioning deep generative raw audio models for structured automatic music," in *Proceedings of the International Society for Music Information Retrieval (ISMIR)*, Paris, France, Sep. 2018.

#### IV-B Workshop Papers

- [W1] R. Manzelli, **Vijay Thakkar**, A. Siahkamari, and B. Kulis, "An end to end model for automatic music generation: Combining deep raw and symbolic audio networks," in *Proceedings of the 6th International Workshop on Musical Metacreation (MUME 2018)*, Salamanca, Spain, Jun. 2018.

## IV-C Posters

- [Q1] R. Manzelli, **Vijay Thakkar**, and B. Kulis, “Combining deep symbolic and raw audio models for improved automatic music generation,” in *Proceedings of the 12th Women in Machine Learning Workshop (WiML 2017)*, Long Beach, California, Dec. 2017.

## IV-D Talks

- [T1] **Vijay Thakkar** and R. Vuduc, “Dense semiring linear algebra on modern cuda hardware,” Mar. 2021. [Online]. Available: <https://bit.ly/thakkar-cse-21>.
- [T2] *Hpc industry roundup: 1st half 2020*, HPC & GPU Supercomputing Group of Boston, Aug. 2020. [Online]. Available: <https://bit.ly/hpc1h20>.
- [T3] *Hpc industry roundup: 2nd half 2019*, HPC & GPU Supercomputing Group of Boston, Aug. 2019. [Online]. Available: <https://bit.ly/hpc2h19>.

## IV-E Submitted Papers

- [S1] P. Sao, L. Hao, **Vijay Thakkar**, R. Kannan, D. Herrmannova, R. Patton, R. Vuduc, and T. Potok, *Communication and memory-efficient all-pair shortest path (APSP) computation on GPU-accelerated clusters*, Aug. 2020.

# V Volunteering

## V-A Conference Program Committee Activities

- August 2022 **IEEE Hot Chips 34**, Student volunteer.
- November 2021 **12th IEEE International Workshop on Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems**, Program committee.
- August 2021 **IEEE Hot Chips 33**, Student volunteer.
- November 2020 **ACM/IEEE Conf. Supercomputing 2020 (SC20)**, Lead student volunteer.
- August 2020 **IEEE Hot Chips 32**, Student volunteer.
- November 2019 **ACM/IEEE Conf. Supercomputing 2019 (SC19)**, Student volunteer.

## V-B Mentoring and Leadership

- 2019-2021 **Graduate Mentor**, Georgia Tech Student Cluster Competition - Team Phoenix
- November 2019 **Peer Mentor**, ACM/IEEE Conf. Supercomputing 2020 (SC20).
- 2017-2019 **Founder and President**, Boston University High Performance Computing Club.

## V-C Open Source Projects

- [F1] [NVIDIA CUTLASS](#).
- [F2] **Linux kernel contributions.** perf PMU counter support for AMD Zen1 and Zen2 processors.
- [F3] **RoB Size Tool** by Travis Downs - A microbenchmark reverse engineering tool for out of order CPUs.
- [F4] **MemeOS** - 32bit x86 operating system built from the bootloader up with thread creation and management, curses like 4bit VGA color terminal, and UFS file system.