# Neel Patel

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## Education

**Cornell University**, PhD in Computer Engineering — Ithaca NY, USA
- Advisor: Prof. Mohammad Alian — Aug 2024 – Present

**University of Kansas**, MS in Computer Science — Lawrence KS, USA
- Advisor: Prof. Mohammad Alian — Jan 2023 – May 2024

**University of Kansas**, BS in Computer Science — Lawrence KS, USA
Aug 2019 - Dec 2022

## Publications

**XRT: An Accelerator-Aware Runtime for Accelerated Chip Multiprocessors** 2025
***Neel Patel***, Mohammad Alian
USENIX Annual Technical Conference (USENIX ATC)

**RACER: Avoiding End-to-End Slowdowns in Accelerated Chip Multi-Processors** 2025
***Neel Patel***, Mohammad Alian
ACM Transactions on Architecture and Code Optimization (TACO)

**Accelerating Retrieval-Augmented Generation** 2025
Derrick Quinn, Mohammad Nouri, ***Neel Patel***, John Salihu, Alireza Salemi, Sukhan Lee, Hamed Zamani, Mohammad Alian
ASPLOS '25 (Architectural Support for Programming Languages and Operating Systems)

**Compute-Enabled CXL Memory Expansion for Efficient Retrieval-Augmented Generation** 2025
Derrick Quinn, ***Neel Patel***, Mohammad Alian
IEEE Micro

**SmartDIMM: In-Memory Acceleration of Upper Layer Protocols** 2024
***Neel Patel***, Amin Mamandipoor, Mohammad Nouri, Mohammad Alian
IEEE International Symposium on High-Performance Computer Architecture (HPCA)

**XFM: Accelerated Software-defined Far Memory** 2023
***Neel Patel***, Amin Mamandipoor, Derrick Quinn, Mohammad Alian
IEEE/ACM International Symposium on Microarchitecture (MICRO)

**Profiling gem5 Simulator** 2023
Johnson Umeike, ***Neel Patel***, Alex Manley, Amin Mamandipoor, Heechul Yun, Mohammad Alian
IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)

**IDIO: Network-driven, Inbound Network Data Orchestration on Server Processors** 2022
Mohammad Alian, Siddharth Agarwal, Jongmin Shin, ***Neel Patel***, Yifan Yuan, Daehoon Kim, Ren Wang, Nam Sung Kim
IEEE/ACM International Symposium on Microarchitecture (MICRO)

## Experience

**Graduate Research Assistant**, Cornell Computer Systems Lab – Ithaca, NY Aug 2024 – Present

- Developed a system and architecture that addressed data movement overheads while scheduling microsecond-scale workloads on server processors with on-chip accelerators.
- Published and presented first-authored papers in top system conferences and journals (ATC'25, TACO)).

**Graduate Research Assistant**, KU I2S – Lawrence, KS Jan 2023 – Aug 2024

- Improved performance efficiency of datacenter workloads through hardware-software co-design.
- Published and presented first authored papers in top-tier conferences (MICRO'23, HPCA'24)).

**Research Intern**, Los Alamos National Laboratory – Los Alamos, NM May 2023 – Dec 2023

- Assessed memory bottlenecks in memory-bound applications characterized by sparse and unpredictable data access patterns.
- Evaluated emerging near-memory architectures and protocols (e.g., CXL) to ascertain potential performance improvements for NNSA workloads.

**Undergraduate Research Assistant**, KU ITTC – Lawrence, KS Oct 2020 – Dec 2022

- Improved performance of datacenter workloads through end-host networking optimizations.
- Published co-authored papers in top-tier conferences (MICRO'22, ISPASS'23).
- Gave talks at workshops about tools in development (ASPLOS'23 Firesim/Chipyard Workshop).

## Honors

2022 **KU Locke Award Nominee**, Engineering Senior of the Year Nomination By Faculty in EECS Department
2022 **Undergraduate Research Award**, Awarded to 9 undergraduate researchers at KU. For work accelerating upper-layer network protocols
2021 **Samsung Open Innovation Contest 2nd Place**, Awarded for our work accelerating upper-layer network protocols using a near-memory accelerator prototype
2021 **Undergraduate Research Fellowship**, Awarded to 13 undergraduate researchers in KU's Engineering department

## Talks

2025 **Guest lecture on software-defined far memory in datacenters** ECE 6960 Datacenter Computer Architecture at Cornell
2025 **Accelerator Chaining over CXL** Semiconductor Research Corporation (SRC) Presentation
2025 **Efficient Scheduling and Optimized Data Movement for Latency-Critical Applications on Accelerated Chip Multiprocessors** Semiconductor Research Corporation (SRC) Presentation

2024 **Unlocking the Potential of Accelerated Chip Multi-Processors** Semiconductor Research Corporation (SRC) Presentation

2024 **Improving Computation after Moore's Law** Guest Lecture at KU's EECS Senior Capstone Class

2023 **Tackling the Memory Wall: Opportunities and Advancements** Guest Lecture at KU's EECS Senior Capstone Class

2023 **XFM: Near-Memory Acceleration of Far Memory** Paper Presentation (MICRO)

2023 **XFM: Near-Memory Acceleration of Far Memory** Semiconductor Research Corporation (SRC) Presentation

2022 **SmartDIMM: Near-Memory Acceleration of Upper-Layer Network Protocol Processing** Semiconductor Research Corporation (SRC) Presentation

## Coursework

- Advanced Operating Systems
- Modern Computer Architecture
- Advanced Computer Architecture
- Advanced Compilers
- Software Reverse Engineering
- Advanced Data Structures
- Algorithms
- Operating Systems
- Compilers

- Numerical Algorithms
- Embedded Systems
- Digital Logic and Design
- Linear Algebra