

Alex Hankin

Curriculum Vitae

PERSONAL INFORMATION

Full Name: Alexander R. Hankin
Email: ah7149407@gmail.com

CURRENT POSITION

Research Scientist, Intel Labs

EDUCATION

2022 Ph.D. Electrical Engineering, Tufts University
2018 M.S. Electrical Engineering, Tufts University
2012-2016 B.S. Computer Engineering, minor in Mathematics, Tufts University

AWARDS

2022 Greenough Fellow, Tufts University
2021 Best Project Award, Quantum Computing Workshop at ISCA
2015 5-Year Combined B.S. & M.S. Program, Tufts University
2013-2015 Dean's List, Tufts University

PROFESSIONAL CAREER

2022-present Research Scientist, Intel Labs
2022-2023 Associate, Harvard University
2022 Postdoctoral Fellow, Harvard University
2020 Research Intern, Intel
2019 Research Intern, Google
2017-2022 Research and Teaching Assistant, Tufts University

RESEARCH INTERESTS

Computer Systems and Architecture
Next Generation Computing Systems and Technologies
Analysis and Optimization Technologies for Computer Systems
Hardware Telemetry
Analytical and Abstract Modeling of Program Behavior and Computer Systems
Microservices and Datacenter Workloads
Design and Modeling of Memory System Architectures
Emerging Non-Volatile Memory
Advanced On-Chip Thermal Hotspots
Trapped-Ion Quantum Computer Architecture

PUBLICATIONS

2024

(pending publication) S. Kataoka, S. Ghimire, **A. Hankin**, and L. Pentecost, "Evaluating Recent Embedded Non-Volatile Memory (eNVM) Advancements and Optimizing Selection for Workload Needs. 10 pages."

(accepted for publication) **A. Hankin**, A. Mahmoud, M. Hempstead, D. Brooks and G. -Y. Wei, “Exploring the Impact of Weak Links Between Chains in Trapped Ion Quantum Computers,” 2024 IEEE International Symposium on Workload Characterization (IISWC), Vancouver, Canada, 2024. 10 pages.

2023

A. Hankin, A. Mahmoud, M. Hempstead, D. Brooks and G. -Y. Wei, “VelociTI: An Architecture-level Performance Modeling Framework for Trapped Ion Quantum Computers,” 2023 IEEE International Symposium on Workload Characterization (IISWC), Ghent, Belgium, 2023, pp. 206-210, doi: 10.1109/IISWC59245.2023.00040.

A. Hankin*, L. Pentecost*, D. Min, D. Brooks, and G. Y. Wei (***joint first authors**), “Is the Future Cold or Tall: Design Space Exploration of Cryogenic and 3D Embedded Cache Memory,” in 2023 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS). April 23-25, 2023. Raleigh, North Carolina.

M. Amiraski, D. Werner, **A. Hankin**, J. Sebot, K. Vaidyanathan, M. Hempstead, “Boreas: A Cost-Effective Mitigation Method for Advanced Hotspots using Machine Learning and Hardware Telemetry,” in 2023 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS). April 23-25, 2023. Raleigh, North Carolina.

2022

A. Hankin, L. Pentecost, M. Donato, M. Hempstead, G. Y. Wei, and D. Brooks, “The Persistence of Non-Volatile Memory: Exploiting the Growing Design Space,” in Computer Architecture Today, ACM SIGARCH, August 2022.

D. Werner, M. Amiraski, **A. Hankin**, J. Sebot, K. Vaidyanathan, and M. Hempstead, “Utilizing the HotGauge Framework for Hotspot Behavior Analysis,” HotSpots Strike Back (HSSB) Workshop at ISCA 2022.

A. Hankin, “Evaluation of Embedded Non-Volatile Memories for Modern Computing Systems”, Tufts University. 119 pages. ProQuest Dissertations and Theses. 2022.

L. Pentecost*, **A. Hankin***, M. Donato, M. Hempstead, G. Y. Wei, and D. Brooks (***joint first authors**), “NVMEexplorer: A framework for cross-stack comparisons of embedded non-volatile memories,” in 2022 IEEE International Symposium on High-Performance Computer Architecture (HPCA), 2022, pp. 938–956.

2021

A. Hankin*, D. Werner*, J. Sebot, K. Vaidyanathan, M. Amiraski, and M. Hempstead (***joint first authors**), “HotGauge: A Methodology for Characterizing Hotspots in Next Generation Processors,” 2021 IEEE International Symposium on Workload Characterization (IISWC), November 2021.

A. Hankin and M. Hempstead, “Proposal for a Timing Model of Ion Trap Quantum Architectures,” I too can Quantum! (I2Q) at ISCA 2021. **Best project award winner**.

A. Hankin, M. Amiraski, K. Sangaiah, and M. Hempstead, “Toward Faster and More Efficient Training on CPUs Using STT-RAM-based Last Level Cache,” 12th Annual Non-Volatile Memories Workshop (NVMW), San Diego, CA, USA, 2021.

2019

A. Hankin, T. Shapira, K. Sangaiah, M. Lui and M. Hempstead, “Evaluation of Non-Volatile Memory Based Last Level Cache Given Modern Use Case Behavior,” 2019 IEEE International Symposium on Workload Characterization (IISWC), Orlando, FL, USA, 2019, pp. 143-154, doi: 10.1109/IISWC47752-2019.9042051.

TEACHING EXPERIENCE

2021 Teaching Assistant, Introduction to Circuits and Electronics (Fall), Tufts University
2021 Teaching Assistant, Advanced Computer Architecture (Spring), Tufts University
2020 Teaching Assistant, Electronics (Spring), Tufts University
2018 Teaching Assistant, Hardware-Software Image Processing (Fall), Tufts University
2018 Teaching Assistant, Machine-centric Approach to Programming (Fall), Tufts University
2018 Teaching Assistant, Advanced Computer Architecture (Spring), Tufts University
2017 Teaching Assistant, Computer Organization and Design (Fall), Tufts University

OPEN SOURCE SOFTWARE

2023 VelociTI
2021 HotGauge
2021 NVMEexplorer

WORKSHOPS, TUTORIALS

2022 NVMEexplorer, International Symposium on Computer Architecture (ISCA)
2022 HotSpots Strike Back, International Symposium on Computer Architecture (ISCA)

CONFERENCE TALKS, WORKSHOP TALKS, POSTERS

2024 IEEE International Symposium on Workload Characterization (IISWC)
2023 IEEE International Symposium on Workload Characterization (IISWC)
2023 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)
2022 IEEE International Symposium on High-Performance Computer Architecture (HPCA)
2021 IEEE International Symposium on Workload Characterization (IISWC)
2021 I too can Quantum! at IEEE International Symposium on Computer Architecture (ISCA)
2021 12th Annual Non-Volatile Memories Workshop (NVMW)
2019 IEEE International Symposium on Workload Characterization (IISWC)

PROFESSIONAL SERVICE

2024 Program Committee, IEEE International Symposium on Workload Characterization (IISWC)
2024 Program Committee, IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)
2023 Program Committee, IEEE International Symposium on Workload Characterization (IISWC)
2023 Artifact Evaluation Committee, European Conference on Computer Systems (EuroSys)
2022 Program Committee, IEEE International Symposium on Workload Characterization (IISWC)