Ryan M. Kim

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Education

Northeastern University Boston, MA
B.S. in Electrical and Computer Engineering, GPA: 3.5, Dean's List 2028

- Coursework: Digital Design and Computer Organization, Embedded Design: Enabling Robotics, Discrete Structures, Circuits and Signals, Fundamentals of Algorithms, Fundamentals of Networks, Physics I/II, Calculus III, Differential Equations and Linear Algebra.

Technical Skills

Programming: Python, C/C++, Racket, Bash, MATLAB, PyTorch, scikit-learn, NumPy, Pandas
Hardware: Parallel Programming, Vivado, Quartus Prime, SystemVerilog, Verilog, LTspice, KiCad
Tools: Git, Linux, LaTeX, Markdown

Research Experience

Undergraduate Researcher Boston, MA
Northeastern University, under Professor Yanzhi Wang January 2026 - Present

- Researching world models for robotic manipulation tasks

Research Assistant, Schiffer Lab Worcester, MA
UMass Chan Medical School, Department of Biochemistry and Molecular Biotechnology August 2022 – September 2024

- Investigated structural basis of influenza virus entry using cryo-electron tomography and deep learning
- Developed and trained convolutional neural networks to automatically segment viral protein components, processing 100+ tomograms and enabling subnanometer structural determination of 12,000+ particles at 8–10 Å resolution
- Contributed to quantitative morphology analysis pipeline using scikit-learn, Open3D, and EMAN2.99

Publication

Q.J. Huang, **R. Kim**, K. Song, N. Grigorieff, J.B. Munro, C.A. Schiffer, & M. Somasundaran. "Virion-associated influenza hemagglutinin clusters upon sialic acid binding visualized by cryoelectron tomography." *Proc. Natl. Acad. Sci. U.S.A.* **122**(16): e2426427122 (2025). doi.org/10.1073/pnas.2426427122

Projects

Parallel Tiling Image Filters | C++, POSIX threads Boston, MA
2026

- Built a multithreaded image processing tool that splits images into tiles and applies convolution-based filters using a thread pool architecture
- Implemented grayscaling, thresholding, Gaussian blur, edge detection, and sharpening
- Implemented thread-safe task scheduling with POSIX mutexes and condition variables

WM-811K Wafer Defect Analysis Pipeline | Python, Pandas, NumPy, SciPy Boston, MA
2025

- Developed a semiconductor defect analysis pipeline in Python to process 172,000 wafer maps across 8 classes, utilizing SciPy for image interpolation and resizing to generate averaged probability heatmaps
- Engineered an automated reporting system using Matplotlib and fpdf2 to visualize statistical trends and generate a 20-page defect "field guide"

Engagement Experience

Greater Worcester Community Foundation Worcester, MA
Youth For Community Improvement 2021 - 2023

- Evaluated grant applications and allocated $40,000 in funding to nonprofit organizations addressing community issues in a youth-led program
- Facilitated meetings with community speakers and authored advocacy briefs for grant decision-making