Kevin Y. Wu

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Education

University of Chicago 9/2020 – 6/2024
4-Year Joint BS/MS Degrees
- B.S., Computational and Applied Mathematics
- M.S., Computer Science
- GPA: 3.95/4.00; *Summa Cum Laude*

Papers

* *denotes equal contribution.*

PROGRESSOR: A Perceptually Guided Reward Estimator with Self-Supervised Online Refinement
Tewodros W. Ayalew, Xiao Zhang*, **Kevin Yuanbo Wu***, Tianchong Jiang, Michael Maire, and Matthew R. Walter
Conference on Computer Vision and Pattern Recognition (CVPR), 2025
Under review – submitted 11/15/2024, manuscript ID: 10544
arXiv | code | website

EMERGENET: A Digital Twin of Sequence Evolution for Scalable Emergence Risk Assessment of Animal Influenza A Strains
Kevin Yuanbo Wu, Jin Li, Aaron Esser-Kahn, and Ishanu Chattopadhyay
Science Advances
Under review – submitted 7/4/2024, manuscript ID: adr8858
arXiv | code | website

Riemman-Roch through the Dollar Game
Kevin Yuanbo Wu
University of Chicago Mathematics REU, 2021
paper

Awards

Enrico Fermi Scholar – Top 5% of Physical Sciences Division 2023, 2024
Dean's List – Awarded each year of undergrad 2021, 2022, 2023, 2024
Phi Beta Kappa – Elected junior year 2023
Robert Maynard Hutchins Scholar – Top 10% of class 2022
Hack@Brown Wolfram Award – Top 25 projects 2021
LEGO Design Award – Model displayed at LEGOLAND 2020

Experience

MathWorks 9/2024 – Present
Software Engineer, Engineering Development Group
- Implementing continuous collision detection between convex shapes in C++ using the Gilbert-Johnson-Keerthi (GJK) algorithm.
- Finding penetration depth using the Expanding Polytope Algorithm (EPA).

Robotic Intelligence through Perception Lab at TTIC 3/2024 – Present
Advisor: Prof. Matthew Walter
- Worked on PROGRESSOR, a self-supervised reward model capable of learning task rewards from unlabeled human videos. Benchmarked the reward function using the DrQ-v2 reinforcement learning (RL) algorithm in the Meta-World environment, and tested it on real-robot tasks via reward-weighted imitation learning using Action Chunking Transformers (ACT).

- Implemented two teleoperation systems for a UR5 robot with Leap Motion hand-tracking camera and Meta Quest 3. Exhibited at the Museum of Science in Chicago and enabled efficient collection of task demonstrations.
- Designed and built a fully-programmable 4-DoF robotic arm module for Duckietown, a company offering small autonomous vehicles for education and research.

Zero Knowledge Discovery Lab at UChicago Medicine 11/2021 – 7/2024
Advisor: Prof. Ishanu Chattopadhyay

- Developed EMERGENET, a model for assessing the emergence risk of non-human Influenza A strains. Wrote an open-source Python package.
- Validated EMERGENET on $\sim 220k$ sequences from 2003 - 2023, outperforming WHO vaccine recommendations for H1N1/H3N2 in 81% of seasons.
- EMERGENET predicted risk scores correlate ($R = 0.721, p = 10^{-4}$) with the CDC's expert-evaluated IRAT (Influenza Risk Assessment Tool) scores.

MathWorks 6/2023 – 8/2023
Software Engineer Intern, Deep Learning Compression Team

- Developed a neural network to classify ECG signals from a wearable device.
- Implemented and trained Neural ODE (NODE) and Deep Equilibrium (DEQ) models to benchmark performance against Residual Network (ResNet).

MathWorks 6/2022 – 9/2022
Software Engineer Intern, Install & Licensing Team

- Built automated tests in Java JUnit and MATLAB for new license borrowing functions and user interface, achieving 100% code coverage.
- Built Python performance tests to optimize MATLAB startup speed.

University of Chicago, Department of Mathematics 6/2021 – 8/2021
REU Student

- Wrote an expository paper on the chip-firing game and its use in proving the graph-theoretic analogue of the Riemann-Roch theorem.
- Solved problems and attended lectures on combinatorics, geometry, and analysis.

Teaching

Toyota Technological Institute at Chicago (TTIC) 6/2024 – 8/2024
Instructor, Robotic Manipulation Course

- Designed curriculum for a six-week, hands-on robotic manipulation course for three high-school interns from underrepresented communities.
- Taught students to build a low-cost 5-DoF arm from Dynamixel servos and 3D-printed parts and program it to pick-and-place tic-tac-toe pieces.
- Gave lectures on Python programming, robot kinematics, and machine learning.

University of Chicago, Department of Computer Science 9/2023 – 3/2024
Course Grader

- MPCS 50103 – Discrete Mathematics (Fall 2023, 96 students)
- CMSC 27200 – Theory of Algorithms (Winter 2024, 180 students)

Skills

Technical Languages: Python, C++, MATLAB, SQL, LaTeX
Frameworks: PyTorch, Sklearn, NumPy, Pandas, OpenCV, MuJoCo
Tools: Unix/Linux, Git, Docker, Bash
Spoken Languages: English (native), Mandarin (native)
Hobbies: LEGO (channel), guitar, soccer, basketball, reading