

**Education**      **University of Chicago**      Sept. 2020 - June 2024  
*4-Year Joint BS/MS Degree*

- B.S., Computational and Applied Mathematics
- M.S., Computer Science
- GPA: 3.953/4.00; *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  
*Under review, Conference on Computer Vision and Pattern Recognition (CVPR), 2025*  
[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  
*Under review, Science Advances, 2024*  
[arXiv](#) | [code](#) | [website](#)

**Riemman-Roch through the Dollar Game**  
**Kevin Yuanbo Wu**  
*University of Chicago Mathematics REU, 2021*  
[paper](#)

**Experience**      **MathWorks**      Sept. 2024 - Present  
*Software Engineer, Engineering Development Group*

- Implementing continuous collision detection between convex shapes in C++ using the Gilbert–Johnson–Keerthi (GJK) algorithm and finding penetration depth using the Expanding Polytope Algorithm (EPA).
- Updating MATLAB’s existing inverse kinematics (IK) solvers to include a constraint based on penetration depth for collision-free IK.

**Robotic Intelligence through Perception Lab**      Mar. 2024 - Present  
*Advisor: Prof. Matthew Walter*

- Working on a project learning latent actions between consecutive frames of unlabeled human videos. Fine-tuning the latent-action prediction model on small-scale robot data to ground latent actions to real robot actions.
- 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 behavioral cloning (BC) using Action Chunking Transformers (ACT).
- Designed a six-week robotic manipulation course, teaching high school students to build a low-cost 5-DoF arm and program it to pick-and-place tic-tac-toe pieces. Covered Python, robot kinematics, computer vision.

- 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

Nov. 2021 - July 2024

*Advisor: Prof. Ishanu Chattopadhyay*

- Developed [EMERGENET](#), a framework built on conditional inference trees to capture long-range structural dependencies in viral genomes with only sequence data.
- Introduced *E-distance* metric quantifying mutation probabilities between viral strains to assess the emergence risk of animal Influenza A strains.
- 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

June 2023 - Aug. 2023

*Software Engineer Intern, Deep Learning Compression Team*

- Developed a neural network to classify ECG signals from a wearable device.
- Applied model quantization to reduce memory footprint for embedded systems.
- Implemented and trained Neural ODE (NODE) and Deep Equilibrium (DEQ) models to benchmark performance against Residual Network (ResNet).

### MathWorks

June 2022 - Sept. 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 profile MATLAB startup speed, identifying critical bugs and optimization opportunities.

### University of Chicago Department of Mathematics

June 2021 - Aug. 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 talks on combinatorics, geometry, and analysis.

## Awards

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

## Skills

**Technical Languages:** Python, C++, MATLAB, SQL,  $\text{\LaTeX}$   
**Frameworks:** PyTorch, Sklearn, NumPy, Pandas, OpenCV, MuJoCo  
**Tools:** Unix/Linux, Git, Docker, Bash  
**Spoken Languages:** English (native), Mandarin (native)  
**Hobbies:** LEGO ([YouTube channel](#)), guitar, soccer, basketball, reading