

Education

Georgia Institute of Technology

Master's Degree in Computer Science

Atlanta, GA

2024 - 2026 (expected)

- GPA: 4.00/4.00
- Specialization: Machine Learning
- Advisor: James Hays

New York University

Bachelor's Degree in Computer Science and Mathematics

Manhattan, NY

2020 - 2024

- GPA: 3.73/4.00
- Advisor: Gizem Kayar

Publications

1. **Chen, Y.***, Singh, S.*, Chatterjee, A., Raj, A., Hays, J., Yang, Y., & Baral, C. (2026). Chimera: Compositional Image Generation using Part-based Concepting. *Under review at ICLR 2026*.
2. Yang, M., **Chen, Y.**, Pei, H., Agarwal, S., Vasudevan, A. B., & Hays, J. (2025). Clink! Chop! Thud! - Learning Object Sounds from Real-World Interactions. *ICCV 2025*.
3. **Chen, Y.**, Liu, Y., & Kayar-Ceylan, G. (2025). CSG-based ML-supported 3D translation of sketches into game assets for game designers. *The Visual Computer*, 1-13.
4. **Chen, Y.** (2020). A Device for Compressing Garbage in Dustbin. *China National Intellectual Property Administration*, Patent No. CN210823859U.

Presentations

1. **Chen, Y.**, Liu, Y., "CSG-based ML-supported 3D translation of sketches into game assets for game designers", New York University Undergraduate Research Conference, NY, May 2024

Research Experience

Benchmarking World Models with Physical Property Understanding

Research Assistant, Advised by Prof. James Hays

Aug 2025 - Present

- Developing a novel benchmark of physically impossible videos for evaluating the physical property understanding and reasoning capabilities of modern world models.
- Generating diverse, counterfactual scenarios using a structured prompt taxonomy with both high-fidelity simulations and state-of-the-art Text-to-Video models.

Egocentric-to-3D Interaction Reconstruction

Research Assistant, Advised by Prof. Yalong Yang

Mar 2025 - Present

- Implementing a 3D reconstruction pipeline using MegaSam to map egocentric interaction data into semantically segmented 3D spaces.
- Developing a novel view synthesis framework that decouples the observer from the user, allowing third parties to visualize first-person tasks from arbitrary external viewpoints.

Learning Object Sounds from Real-World Interactions

Research Assistant, Advised by Prof. James Hays

Sep 2024 - Oct 2025

- Proposed the sounding object detection task to identify source objects from interaction sounds.
- Developed a multimodal, object-aware framework using a slot attention encoder and an automatic annotation pipeline to learn from egocentric videos.
- Improved SOTA on sounding object detection by 11.8% on Epic Kitchens and 9.8% on Ego4D.

Part-based Compositional Image Generation

Research Assistant, Collaboration with Google DeepMind

Aug 2024 - Present

- Constructed a novel training dataset of 37k images based on a taxonomy of 464 unique pairs to enable fine-grained compositional generation.
- Proposed the PartEval metric to systematically assess the fidelity and compositional accuracy of part-based generation pipelines.
- Developed a diffusion prior model with part-conditional guidance that outperforms baselines by 14% in compositional accuracy and 21% in visual quality.

Gaussian Visibility Field for Uncertainty Mapping

Research Assistant, Collaboration with NVIDIA

Aug 2024 - Dec 2024

- Developed novel neural field representations by applying Bayesian deep learning principles to map and quantify uncertainty in 3D scenes for autonomous systems.
- Engineered the system for real-time performance by optimizing the neural field's computational efficiency through advanced GPU parallelization and CUDA techniques.

Unity ML-Agents with Walking Robot using Curriculum Training

Research Assistant, Advised by Prof. Jeremy Curuksu

Mar 2024 - May 2024

- Investigated sample-efficient training for embodied agents by integrating curriculum learning with advanced deep RL algorithms (PPO) to accelerate policy convergence.
- Enhanced the agent's navigation capabilities by implementing a ray-based perception system for robust and efficient obstacle avoidance in complex environments.

CSG-based ML-supported 3D Translation of Sketches into Game Assets

Research Assistant, Advised by Prof. Gizem Kaya-Ceylan

May 2023 - Jan 2025

- Developed a computer vision pipeline to extract geometric primitives, training a CNN shape classifier that achieved 95.74% accuracy on the test set.
- Engineered a real-time web application using CSG Boolean operations to reconstruct sketches into textured 3D models in 31-33 seconds.

Industry Experience

Amazon Web Services - Annapurna Labs

Cupertino, CA

Machine Learning Engineer Internship

May 2025 - Aug 2025

- Designed and implemented pipeline parallel processing in NxDI stack for large language models, improving distributed training efficiency by 35%.
- Implemented Sequence Pipeline Parallel to create a prompt parallel architecture for window context encoding, enhancing vLLM inference performance by 2.3x.
- Collaborated with the inference team to optimize distributed tensor and pipeline parallelism, documenting 40% latency improvements using NeuronTransferEngine.

T.C.L. Industries Holdings

Shenzhen, China

Machine Learning Engineer Internship

Jun 2024 - Aug 2024

- Led the development of predictive analytics models using LSTM, increased accuracy from 40% to 90%.
- Developed APIs for the model, making the model efficient to use internally and reducing costs by 35%.
- Integrated the model with Microsoft 365, enabled others to fine-tune different specific prediction models.

Awards

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| • Dean's Undergraduate Research Fund , New York University | 2023.09 |
| • Registration Support Scholarship , New York University | 2022.09 |
| • Student Relief Scholarship II , New York University | 2022.02 |
| • Student Relief Scholarship , New York University | 2021.09 |

Teaching

Teaching Assistant

Georgia Institute of Technology

Computer Vision (CS 6476 A) - Head TA

Fall 2025

Computer Vision (CS 6476 A)

Spring 2025

Teaching Assistant

New York University

Computer Systems Organization (CSCI-UA 201)

Spring 2024

Computer Systems Organization (CSCI-UA 201)

Fall 2023

Great Ideas in Math (CORE-UA 110)

Spring 2023

Algebra, Trigonometry, and Functions (MATH-UA 9)

Fall 2022