Chuanyang Jin

+1-347-866-3543| Email | Personal Website | Github | Linkedin | Apt 416, 180 River Dr, Jersey City, NJ

Education

New York University Sep 2020 – May 2024

B.A Honors Computer Science; B.A Mathematics *GPA: 3.96, Major GPA: 4.0*

- Relevant coursework: Machine Learning (Grad), Deep Learning (Grad), Computer Vision (Grad), Natural Language Processing (Grad), Big Data (Grad), Algorithms (TA), Object Oriented Programming, Operating Systems, Computer Systems, Probability, Differential Equations, Numerical Analysis, Real Analysis

Publications / Working Papers

Self-Supervised Visual Place Recognition using Perspective Images

Chuanyang Jin, Zegang Cheng*, Chao Chen* and Chen Feng. Expected to submit this winter.*

Deciphering the Mechanisms of RNA Splicing with Interpretable Machine Learning

Chuanyang Jin, Jingyi Fei and Oded Regev. Submitted to ***Molecular Cell 2023****.*

Research / Work Experience

NYU AI4CE Lab May 2022 – present

Research Assistant advised by Prof. Chen Feng *New York*

- Propose a self-supervised framework for visual place recognition (VPR), incorporate an encoder-decoder network that performs scene completion for perspective images, and use temporal neighborhoods and learnable feature neighborhoods to discover unknown spatial neighborhoods.
- Conduct experiments on simulated and real datasets, and outperform baselines in recall rate and robustness.
- Refactor the pipeline and combine nine branches for the lab's previous open-source VPR project.

NYU Regev Lab & Flatiron Institute, Simons Foundation Jan 2022 – present

Research Assistant advised by Prof. Oded Regev *New York*

- Present a neural network model that provides insights into RNA splicing. Use an "interpretable-by-design" approach, and achieve predictive accuracy on par with state-of-the-art models.
- Trace and quantify the entire decision process from input sequence to output splicing prediction. The model reveals novel components of the splicing logic, which we experimentally validates.

Huawei Technologies Co., Ltd. June 2021 – Aug 2021

Software Engineer Intern *Nanjing*

- Maintain and extend the functionalities of a company's personnel/financial data management web platform.
- Design, realize, and test tools with MySQL that empowers administrators to operate on shared databases.
- Utilize Django web framework in Python and implement frontend interactive interface with JavaScript.

Project Experience

Diffusion Guided by a Synchronously Trained Classifier Sep 2022 – present

- Course Project in CSCI-GA 2271 Computer Vision. Build and train a diffusion model under the guidance of a synchronously trained classifier without any pre-trained classifier guidance.
- Experiment on its generating power to perform data augmentation, and measure by Fréchet Inception Distance (FID) and other specific metrics we propose based on the properties of the downstream tasks.

Parallel Operating System Aug 2022 – present

- Build an interactive Unix shell, manage foreground/background processes, and handle I/O redirection and pipe.
- Implement a thread pool using mutexes and condition variables, and use it to parallelize provided tasks.

Self-supervised Object Detection April 2022 – May 2022

- Perform Masked Autoencoder (MAE) pre-training on a Vision Transformer (ViT) model using 512K unlabeled images. Fine-tune the backbone with 3K labeled images for the task of object detection, where a feature pyramid network from ViTDet and a Faster R-CNN detection head are adopted as the predictor.

Graph Visualization of Matrices March 2022 – May 2022

- Introduce a novel shift method to accelerate the convergence of power iterations for computing tensor eigenpairs.

- Implement dimension reduction with power iterations, propose a *graph Laplacian*, and use them to design a toolbox for graph visualization of matrices. Apply it to discover structures in complex real-world relations.

Asteroid Mining Model Feb 2022 – March 2022

- Awards-winning project in ICM 2022. Project a vision for future asteroid mining industry. Build a comprehensive measure of global equity through Analytic Hierarchy Process, and model how asteroid mining may impact it.
- Detail a profit distribution scheme considering fairness-efficiency trade-offs with PDE-constrained optimization.

Gene Mutation Detection Platform May 2019 – Aug 2021

- Propose a mutation detection algorithm based on computational geometry and parameterized by deep learning.
- Develop an online platform adopted by three hospitals to reduce diagnosis periods, and receive a $10k reward.

Honors/Awards

- Finalist & MAA Award & COMAP Scholarship (Top 4/27205), Interdisciplinary Contest in Modeling 2022
- Champion (Top 1/51) of Tsinghua X-lab AI Hackathon 2021
- Distinguished Honor Roll (Top 1%) in AMC12 & USAMO qualifier 2020
- National Bronze Award (Top 3/500), Shing-Tung Yau High School Computer Science Award 2019
- Finalist (Top 8/3790) of FIRST Robotics Competition World Championship 2019
- Champion of International Regions Math League 2018

Services/Activities

- Teaching Assistant of CSCI-UA 310 Basic Algorithms (Fall 2022)
- Executive board member of NYU Mathematics Society (2021 – Present)
- Director of Environmental Sustainability Committee at NYU Shanghai (2020 – 2021)
- Influential writer on Zhihu Q&A forum with 26K followers and 14,000K total reads

Skills

- Language: C++, C, Python, Java, Matlab, Julia, SQL, R, JavaScript, Octave
- Framework: PyTorch, TensorFlow, Transformers, Scikit-Learn, OpenCV, OpenMP