

Kiyohiro (George) Nakayama
w4756677@stanford.edu | +1(626) 231-6047

EDUCATION

Stanford University

Mathematics, Expected 2024

GPA: 4.02/4.00

Stanford, California, USA

2019 - Present

La Salle College Preparatory

High School Diploma

GPA: 4.60/4.00

Pasadena, California, USA

2017 - 2019

PUBLICATIONS

DiffFacto: Controllable Part-Based 3D Point Cloud Generation with Cross Diffusion

Kiyohiro Nakayama, Mikaela Angelina Uy, Jiahui Huang, Shi-Min Hu, Ke Li, Leonidas Guibas
(In submission)

Semantic-Aware Transformation-Invariant RoI Align

Guo-Ye Yang, **Kiyohiro Nakayama**, Zi-Kai Xiao, Tai-Jiang Mu, Sharon Xiaolei Huang, Shi-Min Hu
(In submission)

WORK EXPERIENCE

Stanford University

Research Assistant

California, USA

October, 2022 – Present

- User friendly controllable shape generation with reformulated diffusion model via shape decomposition.
- Advisors: Mikaela Angelina Uy, Jiahui Huang (Tsinghua University), and Leonidas Guibas

Tsinghua University

Research Assistant

Beijing, China

January, 2022 – August, 2022

- 2D Image Segmentation with an attention-based, aspect-ratio aware feature extraction method.
- Advisors: Guo-Ye Yang and Shi-Min Hu.

Yau Mathematical Science Center

Visiting Student

Beijing, China

October, 2021 – January 2022

- Nonlinear dispersive equations: low regularity, including mass critical/subcritical and energy critical/subcritical, local wellposedness theory of power-type semilinear Schrödinger's equations.
- Advisor: Pin Yu

University of California, Los Angeles

Undergraduate Researcher, Research in Industrial Projects for Students (RIPS)

California, USA

June, 2021 – August, 2021

- Predicting Start-Up Behavior of Heat Pipes and Vapor Chambers from Frozen State. Numerical simulations of multi-phase flow and free boundary problems.
- HRL Labotory

Stanford University

Undergraduate Researcher, Mathematics Department

Online

June, 2020 – August, 2020

- Theories of the Allen-Cahn Equation: general properties, classical solutions on \mathbb{R}^2 , \mathbb{R}^3 , and \mathbb{S}^n .
- Advisor: Jared Marx-Kuo

Ross Mathematics Program

Counselor

Online

June, 2020 – August, 2020

- Led daily lectures about elementary number theoretic topics. Graded students' problem sets and offered feedback on their work. Developed my leadership communication skills in mathematics.

INVITED TALKS

Stanford G-Cafe

April, 2023

- DiffFacto: Controllable Part-Based 3D Point Cloud Generation with Cross Diffusion

PROJECTS

Deep Reinforcement Learning with a Multi-headed Model in Solving Rubik's Cube March, 2021 – June, 2021

- This is a research project for Stanford’s Machine Learning (CS 229) class. I collaborated with two other students to solve the Rubik’s Cube without human knowledge. We used deep reinforcement learning with a multi-headed model to build a layer-by-layer solver that achieves a 100 percent solving rate. Furthermore, by only slightly compromising on solving rate, we were able to reduce our training time three-fold. Finally, our model has more interpretability, and our solver can potentially be commercialized as a Rubik’s Cube solving trainer. The paper is available upon request.

PonyExpress

June, 2020 – March 2021

- We developed a free-to-use platform to lower the risk involved in getting groceries during the COVID-19 pandemic. PonyExpress is a volunteer-based delivery service that seeks to minimize trips to grocery stores, thereby promoting social distancing efforts while ensuring access to essential resources. Our service allows people to rely on others in their community to deliver groceries, thus reducing the risk of infection.

ACADEMIC ACHIEVEMENTS

Qualification of USA Math Olympiad

Spring 2017

SELECTED COURSEWORK AND LANGUAGES

Computer Science and Applied Math

- Linear and Quadratic Optimization, Computer Systems, Parallel Computing, Computer Graphics and Animation, Machine Learning.

Mathematics

- Algebraic Topology, Differential Topology, Riemannian Geometry, Harmonic Analysis, Functional Analysis, PDEs, Measure Theory and Lebesgue Integration, Probability Theory, Groups And Rings, Galois Theory, and Representation Theory

Languages: Mandarin, Japanese, English (All native levels), C++, C, Python, Pytorch, Jittor, L^AT_EX

References available upon request.