

Kai Weixian Lan

Davis, CA, USA



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website



GitHub



Research Interests

Computer graphics, machine learning, character animation, physics-based simulation.



Skills

C++, Python, PyTorch, CUDA, $\text{\LaTeX}$, Markdown, Git, VSCode



Education

University of California, Davis

PhD in Computer Science

Davis, CA

2021–2026 (expected)

University of Northern British Columbia

BSc in Mathematics

Prince George, BC

2018–2021

University College Dublin

Engineering

Dublin, Ireland

2017–2018



Publications

- [1] Shallow Signed Distance Functions for Kinematic Collision Bodies. Osman Akar, Yushan Han, Yizhou Chen, **Weixian Lan**, Benn Gallagher, Ronald Fedkiw, Joseph Teran. arXiv preprint 2024.
- [2] A Neural-preconditioned Poisson Solver for Mixed Dirichlet and Neumann Boundary Conditions. **Kai Weixian Lan**, Elias Gueidon, Ayano Kaneda, Julian Panetta, Joseph Teran. International Conference on Machine Learning, 2024.
- [3] Efficient Layer-by-Layer Simulation for Topology Optimization. **Weixian Lan**, Julian Panetta. ACM Symposium on Computational Fabrication, 2022.



Work Experience

Epic Games

Research intern

Remote

June 2024–present

- Developing generative models for 3D character animations.

UC Davis

Teaching assistant

Davis, CA

Sept 2022–Dec 2022

- Coordinated with students and the instructor, hosted office hours and graded assignments for course ECS 289A Special Topic: Massive Data Computing.

Teaching assistant

Jan 2022–March 2022

- Led tutorials, hosted office hours and graded assignments for course ECS 032A Introduction to Programming

The Wood Innovation and Design Center

Mobile software developer

Prince George, BC

May 2021–Aug 2021

- Developed a mobile application to collect data on vibrations of mass timber floor with Flutter

- Deployed accelerometers on smartphones and on MbitLab boards.

University of Northern British Columbia

Undergraduate tutor

Prince George, BC

Sep 2019–April 2021

- Offered one-to-one tutorials for low-division courses in mathematics and sciences

Student assistant

Jan 2020–Dec 2020

- Graded assignments for a few courses in mathematics

Easter Seals Camp Sunnyside

Camp counsellor

Des Moines, IA

Jun 2018–Aug 2018

- Acted as a camp counselor for campers with special needs

- Managed the behavior and emotions of campers and provided personal care



Academic Projects

Stylized motion generation with text and styles

June 2024–Present

Personal Project

- Developed an AI system that generates stylized human motion from text and example clips, enabling long, smooth, and style-varying animations; happy to share more details on request.

Finite element method for elasticity

March 2022–June 2022

MAT 280 Special topic in elasticity, UC Davis

- Implementing Lagrangian finite element method on simple objects with hyperelasticity properties and simulating deformation with supposed external forces.

Outlier detection using Voronoi k -distance

Sep 2020–Dec 2020

CPSC 473 Data mining, UNBC

- Implemented a computational method for generating Voronoi partitions
- Performed density-based outlier detection by means of the Voronoi k -distance measure

Conformal mapping of the Laplace's equations

May 2019–Aug 2019

Summer research, UNBC

- Applying conformal mapping techniques to solve 2D Laplace's equations on polygonal domains

Finding conserved quantities of dynamic systems

May 2020–Aug 2020

Summer research, UNBC

- Introduced a systematic approach to finding a special form of conserved quantity for polynomial systems
- Reduced the original problem to solving a sequence of linear recurrences equations

Wallpaper groups and the magic theorem

Sep 2019–Dec 2019

MATH 320 Group theory, UNBC

- Studied wallpaper groups of plane symmetries
- Introduced Conway's magic theorem and applications in constructing wallpaper patterns



Services

2024, 2025 ICLR reviewer

Nov - Dec 2024

Graduate Voting Member (alternate) at Council on Student Affairs and Fees, UC Davis

Oct 2023–March 2024

2022 Siggraph Student Volunteer

Aug 8 - 11 2022

2022 Spring GSA Travel Award Committee at Graduate Student Association, UC Davis

Jan–Feb 2022



Awards

Summer Graduate Student Research Fellowship

May–Sept 2023

Graduate Student Fellowship

Sep–Dec 2021, May–Aug 2022

International Student Research Award

May–Aug 2020, May–Aug 2021

Global Excellence Undergraduate Scholarship

Sept 2017–May 2018