Kai Weixian Lan

Davis, CA, USA

✉ kai.weixian.lan@gmail.com 🖥 website GitHub

🔍 Research Interests

Computer graphics, machine learning, character animation, motion synthesis and stylization.

🛠 Skills

C++, Python, PyTorch, CUDA, LaTeX, Markdown, Git, VSCode

📚 Education

University of California, Davis	**Davis, CA**
PhD in Computer Science	2021–present
University of Northern British Columbia	**Prince George, BC**
BSc in Mathematics	2018–2021
University College Dublin	**Dublin, Ireland**
Engineering	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	**Remote**
Research intern	June 2024–present

– Developing AI tools for motion synthesis and stylization.

UC Davis	**Davis, CA**
Teaching assistant	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	**Prince George, BC**
Mobile software developer	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 MbientLab boards.

University of Northern British Columbia	**Prince George, BC**
Undergraduate tutor	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	**Des Moines, IA**
Camp counsellor	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

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-distace 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 ICLR reviwer	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 Commitee 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