Zhaoxun Liu

Lorenz **O**ften **R**epresents the **E**nglish **N**ame for **Z**haoxun

University Health Network, Toronto, ON

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EDUCATION

University of Toronto	**St. George Campus, Toronto, ON**
Department of Computer Science	GPA: 4.0
Master of Science in Applied Computing (MScAC)	*Sep. 2023 – Jun. 2025*

Beihang University	**Beijing, CN**
School of Computer Science and Engineering	GPA: 87/100 *with an* Upper Division GPA: 91/100
Bachelor of Engineering in Computer Science and Technology	*Sep. 2019 – Jun. 2023*

PUBLICATIONS

Using AI to Optimize Patient Transfer and Resource Utilization During Mass-Casualty Incidents: A Simulation Platform
Zhaoxun Liu*, Wagner H. Souza, Jay Han, Amin Madani
arXiv Preprint, 2025

Artificial Intelligence in Breast Cancer Care: Transforming Preoperative Planning and Patient Education with 3D Reconstruction
Mustafa Khanbhai, Giulia Di Nardo, Jun Ma, Vivienne Freitas, Caterina Masino, Ali Dolatabadi, Zhaoxun Liu*, Wey Leong, Wagner H. Souza, Amin Madani
arXiv Preprint, 2025

CrossKeys: Text Entry for Virtual Reality Using a Single Controller via Wrist Rotation
Zhaoxun Liu*, Xiaolong Liu, Lili Wang
International Journal of Human–Computer Interaction (IJHCI), 2024

Hands-Free Is Fine: Gaze-Dominant Object Manipulation in Virtual Reality
Zhaoxun Liu*, Xiaolong Liu, Lili Wang
Journal of Beihang University, 2023 (Undergraduate Thesis)

Temporal Transformer Networks with Self-Supervision for Action Recognition
Yongkang Zhang, Jun Li, Na Jiang, Guoming Wu, Han Zhang, Zhiping Shi, Zhaoxun Liu*, Zizhang Wu
IEEE Internet of Things Journal (IoT), 2023

INDUSTRIAL

University Health Network (UHN)	Since **Feb. 2025**
Machine Learning Specialist	*Toronto, ON*

- I lead the Machine Learning Research Team at the SARA Lab, UHN. We conduct research in foundational models, computer vision, graphics, and reinforcement learning.
- *MasTER* remains my main project. We scale it up to be an ecosystem for general disaster preparedness and training. Keywords: Agentic AI, RAG, LangGraph, Neuro-Symbolic Engine, React, AWS, PyTorch, Foundational Models, Deep Reinforcement Learning.

University Health Network (UHN)	**May. 2024 – Dec. 2024**
Intern Machine Learning Researcher	*Toronto, ON*

- Introduced *MasTER*, a data-intensive triage dashboard with a user-friendly human interface to enable fast patient dispatch in mass-casualty incidents by leveraging PPO-based deep reinforcement learning and large language models.

Ubisoft	**Sep. 2022 – Mar. 2023**
Intern Gameplay Programmer	*Chengdu, CN*

- Researched reinforcement learning (DQN, DDPG) on non-player character actions, behaviours, and interactions.
- *Assassin's Creed Mirage* downloadable contents (DLCs), excelling in C# and Unity3D and performance optimization.
- Achieved notable improvements in DLC performance and functionality, streamlined project workflows with Perforce and Confluence, and successfully delivered high-quality content.

ACADEMIC

Dynamic Graphics Project — Graduate Student
Jan. 2024 – Apr. 2024 · *University of Toronto*
Supervised by **Prof. Tovi Grossman**
- Proposed *DocHub*, a LLM-based interactive system that identifies and visualizes crucial data and their interconnections within documents as node-link diagrams.
- Offered an interactive interface allowing users to modify these visualizations for tailored insights and to pose detailed, context-specific queries for deeper understanding.
- Featured a non-linear abstraction framework to adeptly handle and streamline the complexity of information presented.

Computational Social Science Lab — Graduate Student
Sep. 2023 – Dec. 2023 · *University of Toronto*
Supervised by **Prof. Ashton Anderson**
- Presented a pretrained language model-based framework to detect and reason about entities targeted by hateful memes.
- Provided insight into why certain groups are more susceptible to becoming targets of hateful memes.
- Proposed a specific preventive measure to curb the spread of hateful memes.

State Key Laboratory of Virtual Reality Technology and Systems — Researcher (Undergraduate Thesis)
Feb. 2023 – Jun. 2023 · *Beihang University*
Supervised by **Prof. Lili Wang** & Collaborated with **Ph.D. Xiaolong Liu**
- We proposed a hands-free object manipulation method based on gaze-dominant interaction, which significantly outperforms the current state-of-the-art gaze-based hands-free object manipulation method.
- We designed a novel user study, facilitating a quantitative evaluation of the efficiency of the proposed method.

XDiscovery Lab (Dartmouth HCI Lab) — Intern Researcher
May. 2022 – Sep. 2022 · *Dartmouth College*
Supervised by **Prof. Xing-Dong Yang** & Collaborated with **Ph.D. Zheer Xu**
- Devised a novel text entry method that composes scattered keywords into a natural and clear sentence.
- Designed and developed a keyword extractor using BERT from Hugging Face.
- Retrained the model based on the prompt-based approach to give three different semantic candidate sentences.
- Developed a web application to enable more people to participate in our user study.

State Key Laboratory of Virtual Reality Technology and Systems — Researcher
Sep. 2021 – Feb. 2022 · *Beihang University*
Supervised by **Prof. Lili Wang**
- Led the team to devise *CrossKeys*, a novel and efficient text entry technique for virtual reality (VR) using a single controller via wrist rotation, which unprecedentedly employs the three-dimensional space a virtual environment can provide and outperforms the state-of-the-art method.
- Implemented responsive components, auto-completing prediction algorithm, user interface design, ergonomics-mathematical deduction, and 3D modeling.

State Key Laboratory of Software Development Environment — Intern Researcher
Mar. 2021 – Dec. 2021 · *Beihang University*
Supervised by **Prof. Xianglong Liu** & Collaborated with **Ph.D. Jun Li**
- Developed Cross-Attention ReID, a state-of-the-art approach to realizing pedestrians' re-identification based on training with large-scale datasets generated by single-channeled IR cameras and three-channeled RGB cameras.
- Surveyed literature and applied existing theories to code with high performance and robustness.
- Conducted quantitative analysis and results assessment with datasets like SYSU-MM01 and RegDB.

BNRist and School of Software — Intern Researcher
Oct. 2020 – Jan. 2021 · *Tsinghua University*
Supervised by **Prof. Feng Xu**
- Refined a CVPR accepted project "Monocular Real-time Full Body Capture with Inter-part Correlations".
- Implemented unsupervised training via differentiable renderers.
- Conducted quantitative analysis and cross-datasets tests with datasets like Basel Face Model and 3DMM Face Model.

SKILLSET

Programming Languages: Python, C++, C#, JavaScript & TypeScript
Frameworks & Tools: PyTorch, React & React Native, Unity3D