

# Zhaoxun Liu

Lorenz Often Represents the English Name for Zhaoxun

Department of Computer Science, University of Toronto, St. George Campus

 Zhaoxun (Lorenz) Liu  [lorenz@cs.toronto.edu](mailto:lorenz@cs.toronto.edu)  [lorenz.fun](https://lorenz.fun)  [lorenz-liu](https://github.com/lorenz-liu)

## EDUCATION

### University of Toronto

Department of Computer Science

Master of Science in Applied Computing (MScAC)

St. George Campus, Toronto, ON

GPA: 4.0 (On-going)

Sep. 2023 – Jan. 2025 (Expected)

### Beihang University

School of Computer Science and Engineering

Bachelor of Engineering in Computer Science and Technology

Beijing, CN

GPA: 87/100 with an Upper Division GPA: 91/100

Sep. 2019 – Jun. 2023

## SKILLSET

**Programming Languages:** Python, C++, C#, JavaScript & TypeScript, Scala, Java, SQL

**Frameworks & Tools:** PyTorch, Scikit-Learn, NumPy, SciPy, Matplotlib, Unity3D, React Native & React, Apache Spark, Apache Kafka, Google Firebase, AWS Services, Linux/Unix, Git, Docker, Kubernetes, Flask, PostgreSQL

## EXPERTISE

**Human-AI Interaction:** I apply my expertise in HCI and AI to build interactive data systems, study their impact on users, and search for methods to control AI behaviors and align them with human values and goals.

## PUBLICATIONS

### 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)

Machine Learning Researcher

May. 2024 – Present

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

Intern Gameplay Programmer

Sep. 2022 – Mar. 2023

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

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### Dynamic Graphics Project

Jan. 2024 – Apr. 2024

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.

Graduate Student

*University of Toronto*

### Computational Social Science Lab

Sep. 2023 – Dec. 2023

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.

Graduate Student

*University of Toronto*

### State Key Laboratory of Virtual Reality Technology and Systems

Feb. 2023 – Jun. 2023

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.

Researcher (Undergraduate Thesis)

*Beihang University*

### XDiscovery Lab (Dartmouth HCI Lab)

May. 2022 – Sep. 2022

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.

Intern Researcher

*Dartmouth College*

### State Key Laboratory of Virtual Reality Technology and Systems

Sep. 2021 – Feb. 2022

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.

Researcher

*Beihang University*

### State Key Laboratory of Software Development Environment

Mar. 2021 – Dec. 2021

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.

Intern Researcher

*Beihang University*

### BNRist and School of Software

Oct. 2020 – Jan. 2021

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.

Intern Researcher

*Tsinghua University*

SERVICES

<b>Teaching Assistant</b> Department of Computer Science, University of Toronto “CSC207: Software Design”	<b>Sep. 2024 – Dec. 2024</b>
<b>Teaching Assistant</b> Department of Computer Science, University of Toronto “CSC404: Video Game Design”	<b>Jan. 2024 – May. 2024</b>
<b>Teaching Assistant</b> Department of Computer Science, University of Toronto “CSC165: Mathematical Expression and Reasoning for Computer Science”	<b>Jan. 2024 – May. 2024</b>
<b>Teaching Assistant</b> School of Computer Science and Engineering, Beihang University “Data Structure”	<b>Feb. 2021 – Jul. 2021</b>

AWARDS & CERTIFICATES

2024	Scholarship	The Mitacs Accelerate Fellowship
2023	Award	“Outstanding Undergraduate Thesis” of Beihang University
2021	Scholarship	“Excellent Student Cadres” of Beihang University
2020	The First Prize	The 9th National University Students Arts Performance Competition
2019	Silver Medal	BUAA Basketball Association

SELECTED COURSES

<ul style="list-style-type: none"><li>• MAT1510H - Deep Learning: Theory &amp; Data Science</li><li>• CSC2552H - Topics in Computational Social Science</li></ul>	<ul style="list-style-type: none"><li>• CSC2524H - Topics in Interactive Computing</li><li>• CSC2547H - Topics in Machine Learning: AI Alignment</li></ul>
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EXTRACURRICULAR

<b>Chief Cellist</b> BUAA Symphony Orchestra	<i>Sep.2019 – Jul.2023</i>
<b>Point Guard</b> BUAA Basketball Team	<i>Sep.2019 – Jul.2023</i>