# Zhaoxun Liu

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

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## EDUCATION

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

- MAT1510H - Deep Learning: Theory & Data Science
- CSC2552H - Topics in Computational Social Science
- CSC2524H - Topics in Interactive Computing
- CSC2547H - Topics in Machine Learning: AI Alignment

**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*

## SKILLS

**Programming Languages:** Python, C++, C#, JavaScript & TypeScript, Java, SQL
**Frameworks & Tools:** PyTorch, Unity3D, React Native & React, Firebase, Linux/Unix, NumPy, Matplotlib, Git

## PUBLICATIONS

**Hands-Free Is Fine: Gaze-Dominant Object Manipulation in Virtual Reality**
Zhaoxun Liu*, Xiaolong Liu, Lili Wang
*IEEE International Symposium on Mixed and Augmented Reality (ISMAR), 2023*

**CrossKeys: Text Entry for Virtual Reality Using a Single Controller via Wrist Rotation**
Zhaoxun Liu*, Haowen Zheng, Chenyu Gu, Xiaolong Liu, Lili Wang
*IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 2023*

**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 EXPERIENCE

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

- Leveraging reinforcement learning and large language models to optimally manage mass-casualty trauma.

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

- Researched reinforcement learning (DQN, DDPG) on non-player character actions, behaviours, and interactions.
- Spearheaded the enhancement of an AAA-level video game's downloadable contents (DLCs), excelling in C# and Unity3D for development, debugging, and performance optimization.
- Achieved notable improvements in DLC performance and functionality, streamlined project workflows with Perforce and Confluence, and successfully delivered high-quality content.

## SERVICES

**Teaching Assistant** **Jan. 2024 – May. 2024**
Department of Computer Science, University of Toronto
"CSC404: Video Game Design"

**Teaching Assistant** **Jan. 2024 – May. 2024**
Department of Computer Science, University of Toronto
"CSC165: Mathematical Expression and Reasoning for Computer Science"

**Teaching Assistant** **Feb. 2021 – Jul. 2021**
School of Computer Science and Engineering, Beihang University
"Data Structure"

## ACADEMIC RESEARCH

**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 introduced Clover, a Mode Switching Menu, to provide smooth manipulation mode switching, thereby establishing a complete closed-loop manipulation process.
- We designed a user study with the task of block-building, 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, which may help exaggerate the importance of human factors in studying natural language processing by, in this particular project, observing how people consider keywords.
- 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. Designed and implemented the UI with React framework. Stored data in MongoDB and used ExpressJS as the backend framework.

**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.
- Realized ideas and implemented responsive components, auto-completing prediction algorithm, user interface design, ergonomics-mathematical deduction, and 3D modeling.
- Organized the project and published it to IEEE VR 2023 as the first author.

**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 with PCA (Principal Component Analysis) and cross-datasets tests with datasets like Basel Face Model and 3DMM Face Model.

## AWARDS & CERTIFICATES

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| 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 |

## EXTRACURRICULAR

**Chief Cellist**
BUAA Symphony Orchestra *Sep.2019 – Jul.2023*

**Point Guard**
BUAA Basketball Team *Sep.2019 – Jul.2023*