Liuchuan **Yu** (He/Him)

CS PHD CANDIDATE | DEDICATED TO AI + XR

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"Stand Out Fit In"

Summary

Currently a CS PhD candidate at George Mason University with research at the intersection of AI and XR, including VR, AR, and MR. Published and submitted to top-tier venues such as ACM CHI, IEEE VR, ISMAR, VRST, and Springer Virtual Reality journal. Brings broad software prototyping experience across iOS (OmniCounter, indoor navigation app), Android, Web, and embedded platforms, with strong coding skills in C, C++, Python, and C#. Demonstrated front-end and UI/UX design capability through multiple award-winning XR applications, including Silver Winners at the NY Product Design Awards, Indigo Design Awards, and MUSE Design Awards. Experienced in conversational and agentic AI development, having built Reality Copilot, a voice-first AI assistant powered by large multimodal models (FastVLM, SAM3, Gemini/OpenAI) for context-aware mixed reality interaction. Hands-on experience deploying LLMs and VLMs on edge devices, including running Qwen3/Llama/Gemma on Qualcomm Snapdragon via ExecuTorch with the QNN backend and integrating Apple's FastVLM for on-device multimodal inference; contributed upstream to PyTorch/ExecuTorch. Built a real-time multimodal streaming pipeline bridging Meta Project Aria egocentric glasses with Unity and Microsoft Platform for Situated Intelligence (psi). Previously interned at PICO Lab, ByteDance, where I served as a core contributor, and now I am a maintainer of XRoboToolkit (**Best Paper Award, SII 2026**), an open-source cross-platform framework for real-time XR robot teleoperation adopted by research labs at Georgia Tech, Stanford, CMU, Nvidia, and ByteDance Seed. Proficient with Meta Quest 2/Pro/3, HoloLens 2, and PICO 4 Ultra. Over five years of industry experience as a software and ML engineer. Selected as a Meta Project Aria academic research partner and featured on podcasts for impactful VR research. Passionate about rapid prototyping and validating next-generation AI-powered XR product concepts. Experienced with embedded hardware prototyping using Arduino, NVIDIA Jetson TX2/Orin, and 3D-printed enclosures for physical-digital integration.

Education

GMU (George Mason University)
PH.D. IN COMPUTER SCIENCE

Fairfax, VA, USA
Aug. 2021 - May. 2026 [Expected]

- Dissertation Topic: **AI-Assisted XR Applications for Human Performance Enhancement**
- **Design Computing and Extended Reality (DCXR)** group supervised by **Prof. Craig Yu**

GMU (George Mason University)
M.S. IN COMPUTER SCIENCE

Fairfax, VA, USA
Aug. 2021 - May. 2024

- Distinguished Academic Achievement Award

BJTU (Beijing Jiaotong University)
M.S. IN SOFTWARE ENGINEERING

Haidian, Beijing, China
Sep. 2017 - Jun. 2020

- Thesis: Research on Domain Adaptation and Task Porting Methods for Transfer Learning
- - **Transfer Learning Baseline Toolbox Based on Object Oriented Programming**
- - **Visualize Transfer Learning Datasets Visualizer**

SDUST (Shandong University of Science and Technology)
B.S. IN REMOTE SENSING SCIENCE AND TECHNOLOGY

Qingdao, Shandong, China
Sep. 2011 - Jun. 2015

- Thesis: Design and Implementation of Photogrammetric Fundamental Algorithms Based on Qt
- - **YZCG - Photogrammetry Data Processing System**

Work Experience [**Intern** & FTE]

PICO Lab, ByteDance Inc.
TELEOPERATION RESEARCH INTERN

San Jose, CA, USA
May. 2025 - Aug. 2025

- Conduct research in robot teleoperation and human-robot interaction.
- Develop and evaluate novel control schemes for robotic systems using VR interfaces.
- Collaborated with sales teams to present technical details and prepare user manuals for company products.
- Implement and test integration of various input devices (gloves, motion trackers) for dexterous manipulation.
- Design and optimize stereo vision systems for enhanced spatial awareness.
- Prototype VR applications using Unity for robot teleoperation.
- Conduct user studies and performance evaluations.
- Collaborate with interdisciplinary team members on system integration.

JingHang Co., Ltd.

Beijing, China

PYTHON SOFTWARE ENGINEER

Mar. 2021 - Apr. 2021

- Developed a standardized storage format for English examination data, including A-Level, IELTS, and TOEFL.
- Performed extraction, transformation, and loading (ETL) of unstructured data into a unified, structured format.
- Designed and implemented a web interface for seamless integration and usage by other departments.

KoudaiCaifu Co., Ltd.

Beijing, China

FINANCE DEVELOPMENT ENGINEER

Aug. 2020 - Mar. 2021

- Managed and maintained the Intelligent Investment Consultant System, ensuring data stream accuracy and reliability.
- Identified and resolved bugs in the company's online systems and applications, ensuring smooth operations.
- Enhanced departmental efficiency by introducing innovative utilities and engineering methodologies.

LinkDoc Co., Ltd.

Beijing, China

PYTHON SYSTEM R&D ENGINEER

Aug. 2018 - Dec. 2019

- Led the development, optimization, and maintenance of the Clinical Information Extraction System.
- Enhanced structural accuracy across multiple modules of electronic medical records (EMRs).
- Designed and maintained a PyCharm IDE plugin to support syntax highlighting, auto-completion, and function navigation for a Domain-Specific Language (DSL).

EmoKit Co., Ltd.

Beijing, China

MACHINE LEARNING ENGINEER

Feb. 2018 - Jul. 2018

- Led research and development of machine learning algorithms to advance project outcomes.
- Applied machine learning techniques to support anti-fraud initiatives in the financial industry.
- Integrated advanced algorithms to drive project progress and efficiency.
- Established and introduced a centralized background algorithm center to streamline development and deployment.

WaterTek Corp.

Beijing, China

SOFTWARE ENGINEER

Jul. 2015 - Feb. 2018

- Conducted research on the organization and storage of spatio-temporal big data to improve system efficiency.
- Developed, packaged, and maintained core algorithms using C/C++ for robust performance.
- Designed and implemented an indoor navigation application for the iOS platform.

Esri China Co., Ltd.

Beijing, China

TECHNOLOGY ENGINEER INTERN

Aug. 2014 - Feb. 2015

- Developed prototypes using C#, C++, Java, HTML, and JavaScript on the ArcGIS platform to meet client requirements.
- Designed database structures and authored SQL queries to support application functionality.
- Collaborated with sales teams to present technical details and prepare user manuals for company products.

Skills

Programming	Python, C#, C++, C, Java, Swift, JavaScript, SQL, LaTeX
Platforms & Tools	Windows, Linux (Ubuntu), macOS, Android, iOS, Git, Bash, JetBrains IDEs, VS Code, Claude Code, Conda, Pixi
Embedded & Hardware	Arduino, NVIDIA Jetson TX2, NVIDIA Jetson Orin
Edge AI & ML	ExecuTorch, QNN (Qualcomm), PyTorch, LLM APIs (OpenAI, Gemini, Llama), FastVLM, SAM3, SAM3D
XR Development	Unity, Meta XR SDKs, Meta Quest 2/Pro/3, MRTK, HoloLens 2, Meta Project Aria Glasses, PICO 4 Ultra
3D & Fabrication	3ds Max, Blender, 3D Scanning, 3D Printing, Laser Cutting
Multimodal Frameworks	Microsoft Platform for Situated Intelligence (psi)
Multimedia	Photoshop, Illustrator, Premiere Pro
Languages	English, Mandarin
Soft Skills	Rapid Prototyping, Interdisciplinary Collaboration, Problem Solving, Time Management, User Study Design

Projects & Prototypes

Aria-Psi Bridge (Egocentric Multimodal Streaming Pipeline)

C# / Unity / Python

DEVELOPER

- Integrated **Meta Project Aria** egocentric glasses with Unity and **Microsoft Platform for Situated Intelligence (psi)**, building a real-time streaming pipeline for multimodal sensor data from the Aria glasses into a Unity 3D environment.
- Developed C# components in the **psi** framework to ingest and synchronize temporally-aligned Aria data streams, enabling live visualization and replay of egocentric recordings in Unity.
- **Streaming** | **Replay**

LlamaDemo-Executorch-QNN (Edge AI on Mobile) — *Java / ExecuTorch / QNN*

DEVELOPER

- Deployed LLMs (Qwen3, Llama, Gemma) on-device on a Qualcomm Snapdragon SM8550 Android phone (Samsung Galaxy S23) using Meta ExecuTorch with the Qualcomm QNN backend for hardware-accelerated inference.
- Forked and patched the official ExecuTorch Android LlamaDemo to fix QNN backend integration issues; published pre-built APKs and exported models on **Hugging Face**.
- Independently integrated Apple's FastVLM (vision-language model) into the ExecuTorch QNN pipeline on Qualcomm SM8550, adapting the FastViTHD vision encoder for on-device inference; shared the working patch upstream (**PR#16536**), contributing to Qualcomm's official multi-modal VLM support in ExecuTorch.
- Contributed upstream to PyTorch/ExecuTorch (**PR#16011**).
- **LLM Example** | **VLM Eample**

Reality Copilot (Your Copilot in Real Reality) — *Meta Horizon Start Developer Competition*

DEVELOPER

- Reality Copilot is an AI assistant that understands and enhances our physical world in mixed reality.
- 🎙️**Voice-First Interaction**, 🎛️**Hardware Recording with Microphone and Speaker**, 📧**Context-Aware Email**, Powered by 🤖**FastVLM**, ✂️**SAM3**, 🎨**SAM3D**, and 🌐**Gemini/OpenAI**.
- **Video** | **Devpost**

XRoboToolkit (Cross-Platform XR Robot Teleoperation Framework) — *C# / Unity / C++ / Python / Android*

CORE CONTRIBUTOR & MAINTAINER

- Core contributor and maintainer of XRoboToolkit, an open-source cross-platform framework for real-time robot teleoperation via XR headsets (PICO 4 Ultra, Meta Quest), developed at PICO Lab, ByteDance.
- Built the Unity client (C#) for the XR interface, integrated low-latency video streaming (<100ms), and implemented controller-based robot command mapping for dexterous manipulation.
- Framework adopted by research labs at Georgia Tech, Stanford, CMU, Nvidia, and ByteDance Seed for humanoid teleoperation and data collection.
- Accepted to IEEE/SICE SII 2026. 150+ GitHub stars across repos (as of 02/16/2026).
- **Website** | **GitHub**

HMC (Human Motion Creator) — *Python*

DEVELOPER

- 🕺**Text-to-Motion Generation**: Powered by **Tencent HY-Motion 1.0** and **Meta MHR (Momentum Human Rig)**.
- 😎**Meta XR-Ready**: Compatible with **SMPLX** and **Meta Movement SDK**.
- ⭐**Easy Use**: FBX output with embedded animation.
- **Video** | **Code**

Memoverse (🏆 LA Emergency Response Prize) — *MIT Reality Hack 2025*

DEVELOPER

- A mobile AR experience allows users to explore 3D scans of sites before the fire and share memories, preserving the essence of lost spaces and offering comfort to those affected.
- Team members: **Zihan Li**, **Yan Zeng**, **Tingting Luo**, and **Ernest Choi**.
- **Video** | **8th Wall**

Float Mind (Finalist) — *XR Design Challenge 2024*

DEVELOPER

- Float Mind is an AI-powered MR gamified meditation app designed for stress relief and immersive relaxation.
- Team members: **Zihan Li**, **Yan Zeng**, **Tingting Luo**, and **Shuqi Liao**.
- 🏆 **NY Product Design Awards 2025** | 🏆 **Indigo Design Awards 2025** | 🏆 **MUSE Design Awards 2025**
- **Short Video** | **Long Video** | **Walk-Through Video on Windows** | **Windows Exectable** | **Github**

Meal Master (Finalist) — *XR Design Challenge 2024*

DEVELOPER

- The Meal Master is an innovative MR cooking assistant designed to help users make informed, healthy meal choices while simplifying the cooking process.
- Team members: **Yvie Zhang**
- **Video**

BloomCraft: Garden Guardians (🏆 Best Real-Word Game Prize) — *Niantic Studio*

CORE DEVELOPER

- Discover, plant, and protect a sunflower in our game! Help from Red Bird, water from clouds, and guard against bugs in this interactive adventure.
- Team members: **Yvie Zhang** [Artistic Designer], **Manuel Rebol** [User Experience], and **Hurriyet Ok** [Project Manager].
- **Video** | **8th Wall**

HoloLens 2 Mount (3D Printed Hardware Mount) — *3D Printing*

DEVELOPER

- Designed and 3D-printed a custom tripod mount for HoloLens 2 to enable stable, hands-free operation for research and spectator view capture.
- Modeled parts in 3ds Max, iterated on print settings (resolution, infill), and integrated with off-the-shelf machine screws for structural rigidity.

OmniCounter (iOS App)
Objective-C/Swift

DEVELOPER

- OmniCounter is a Fully Functional Calculator that supports basic, scientific, trigonometry, algebra, calculus, combinatorics, datetime, economics, geometry, matrix, vector, number theory, statistics, and so on.

conda-env-export (PYPI Package)
Python

DEVELOPER

- It's a useful PyPI package that aims to export conda env dependencies and pip requirements to ONE yml file.

Watermark Terminator (PDF Utility)
Python

DEVELOPER

- It's a simple but powerful application to remove text and/or image watermarks in PDF files and output PDF and/or DOCX files.

3to1 (Online Course Utility)
Python

DEVELOPER

- It's designed to merge 3 kinds of online course resources (*.swf, *.grf, *.xml) into 1 video.

Honors & Awards

2026 Mar	**Guest Lecturer**, Spring 2026: Computer Graphics	*Rutgers University*
2026 Mar	🏆 **Best Poster Award**, Construction Research Congress 2026	*CRC 2026*
2026 Feb	🏆 **Best Paper Award**, XRoboToolkit	*SII 2026*
2025 Dec	**PyTorch/ExecuTorch Contributor**, PR#16011	*Meta*
2025 Apr	🏆 **Silver Winner - Social Design: Design for Society**, Float Mind	*NY Product Design Awards 2025*
2025 Apr	🏆 **Silver Winner - Virtual Reality (VR) Design**, Float Mind	*Indigo Design Awards 2025*
2025 Apr	🏆 **Silver Winner - UX, Interface & Navigation for Games**, Float Mind	*Indigo Design Awards 2025*
2025 Mar	🏆 **Silver Winner - Product Design: Gaming, AR & VR**, Float Mind	*MUSE Design Awards 2025*
2025 Jan	🏆 **LA Emergency Response Prize**, Memoverse	*MIT Reality Hack 2025*
2025 Jan	**XR Design Challenge 2024 Finalist**, Float Mind	*Immersive Insiders w/ Meta etc.*
2025 Jan	**XR Design Challenge 2024 Finalist**, Meal Master	*Immersive Insiders w/ Meta etc.*
2024 Dec	**Panel Member**, AR/VR User Research Panel	*Meta*
2024 Oct	🏆 **Best Real-World Game Prize**, BloomCraft: Garden Guardians	*Niantic Create & Play Challenge*
2024 Fall	**CSCI 6907-83 Guest Speaker & Project Mentor**, Advanced Topics in Augmented Reality (AR)	*GWU*
2024 Jul	**Academic Partner**, Project Aria Research Partnership Program	*Meta*
2024 Jul	**VR Work Featured on Podcast**, VR Simulations and ADHD in Construction	*Peggy Smedley Show*
2024 Jun	**ACM Professional Membership**, EICS 2024 Reviewing Appreciation	*ACM*
2024 May	**Distinguished Academic Achievement Award**, Computer Science Department	*GMU*
2024 Apr	**2024 Summer GRA Fellowship**, Center for Advancing Human-Machine Partnership (CAHMP)	*GMU*

Publication

Reality Copilot: Voice-First Human–AI Collaboration in Mixed Reality Using Large Multimodal Models
arXiv

LIUCHUAN YU; YONGQI ZHANG; LAP-FAI YU

HieraVisVR: Hierarchical Visual Analytics for Motion-Centric VR Playtesting [CHI 2026]
Barcelona, Spain

YONGQI ZHANG; ERDEM MURAT; LIUCHUAN YU; HAIKUN HUANG; MINSOO CHOI; CHRISTOS MOUSAS; LAP-FAI YU
Apr. 2026

Understanding the Needs and Challenges of Developing Robot Teleoperation Applications using Mixed Reality Headsets [AHFE 2026]
Istanbul, Türkiye

LIUCHUAN YU; KE JING; ZHIGEN ZHAO; NING YANG; ZHICONG LU
Jul. 2026

Multimodal Psychophysiological Analysis for Team Situation Awareness in Simulated Construction Environments [CRC 2026]
San Antonio, Texas, USA

CHING-YU CHENG; LIUCHUAN YU; LAP-FAI YU; BEHZAD ESMAEILI
Mar. 2026

🏆 Best Poster Award

Enriching Physical-Virtual Interaction in AR Gaming by Tracking Identical Objects via an Egocentric Partial Observation Frame [Virtual Reality]

LIUCHUAN YU; CHING-I HUANG; HSUEH-CHENG WANG; LAP-FAI YU

Springer

XRoboToolkit: A Cross-Platform Framework for Robot Teleoperation [SII 2026]

ZHIGEN ZHAO; LIUCHUAN YU; KE JING; NING YANG

🏆 Best Paper Award

Cancun, Mexico

Jan. 2026

Col-Con: A Collaborative and Configurable VR Platform for Construction — A Pipe Installation Case Study [Virtual Reality]

LIUCHUAN YU; CHING-YU CHENG; WILLIAM F RANC; JOSHUA DOW; MICHAEL SZILAGYI; HAIKUN HUANG; SUNGSOO RAY HONG; BEHZAD ESMAEILI; LAP-FAI YU

Springer

You Are Not Alone: Designing Body Doubling for ADHD in Virtual Reality

ZINAT ARA; IMTIAZ BIN RAHIM; PUQI ZHOU; LIUCHUAN YU; BEHZAD ESMAEILI; LAP-FAI YU; SUNGSOO RAY HONG

arXiv

Memoverse: A Spatial WebAR Social Platform for Memories [VRST 2025]

LIUCHUAN YU; YAN ZENG; TINGTING LUO; ZIHAN LI

Montreal, Canada

Nov. 2025

FloatMind: AI-Driven Emotional Engagement for Gamified Meditation in Mixed Reality [ISMAR 2025]

LIUCHUAN YU; SHUQI LIAO; YAN ZENG; TINGTING LUO; ZIHAN LI

Daejeon, South Korea

Oct. 2025

Multi-Player VR Marble Run Game for Physics Co-Learning [ISMAR 2025]

WILLIAM RANC; THANH NGUYEN; LIUCHUAN YU; YONGQI ZHANG; MINYOUNG KIM; HAIKUN HUANG; LAP-FAI YU

Daejeon, South Korea

Oct. 2025

Visual Allocation of Teams In The Construction Industry: Team Situation Awareness Under Information Overload In Human-AI Collaboration [AHFE 2025]

CHING-YU CHENG; LIUCHUAN YU; LAP-FAI YU; BEHZAD ESMAEILI

Orlando, Florida, USA

Jul. 2025

Player-Centric Difficulty Prediction for Parameterized VR Platformer Gameplay [Under Review]

ERDEM MURAT; LIUCHUAN YU; SIRAJ SABAH; HAIKUN HUANG; LAP-FAI YU

IEEE Transactions on Visualization and Computer Graphic

HoloCook: A Real-Time Remote Mixed Reality Cooking Tutoring System [HCII 2024]

LIUCHUAN YU; BO HAN; SONGQING CHEN; LAP-FAI YU

Washington DC, USA

Jul. 2024

HoloAAC: A Mixed Reality AAC Application for People with Expressive Language Difficulties [HCII 2024]

LIUCHUAN YU; HUINING FENG; RAWAN ALGHOFAILI; BOYOUNG BYUN; TIFFANY O'NEAL; SWATI RAMPALLI; YOOSUN CHUNG; VIVIAN GENARO MOTTI; LAP-FAI YU

Washington DC, USA

Jul. 2024

Establishing Design Computing and Extended Reality Facilities for Remote Virtual Reality Training [IEEEVR 2023]

LAP-FAI YU; CHANGYANG LI; YONGQI ZHANG; RAWAN ALGHOFAILI; HAIKUN HUANG; LIUCHUAN YU; HUIMIN LIU; MINSOO CHOI; BRENDA BANNAN; CHRISTOS MOUSAS

Shanghai, China

Mar. 2023

Synthesizing Shared Space Virtual Reality Fire Evacuation Training Drills [ISMAR 2022]

HUIMIN LIU; MINSOO CHOI; LIUCHUAN YU; ALEXANDROS KOILIAS; LAP-FAI YU; CHRISTOS MOUSAS

Singapore, Singapore

Oct. 2022

Reviewing

2026	**Reviewer**,	Computer Animation and Virtual Worlds
2025	**Reviewer**,	VRST 2025 Papers

2025	**Reviewer**, ISMAR 2025 Papers
2025	**Reviewer**, Computer Animation and Virtual Worlds
2024	**Reviewer**, PRESENCE: Virtual and Augmented Reality
2024	**Reviewer**, CHI 2025 Papers
2024	**Reviewer**, IEEE VR 2025 Papers
2024	**Reviewer**, VRST 2024 Papers
2024	**Reviewer**, ISS 2024 Papers
2024	**Reviewer**, AutomotiveUI 2024 Works in Progress
2024	**Reviewer**, ISMAR 2024 Posters
2024	**Reviewer**, ISMAR 2024 Conference Papers
2024	**Reviewer**, ISMAR 2024 Journal Papers
2024	**Reviewer**, EICS 2024 Demos and Posters
2023	**Reviewer**, IEEE VR 2023 Workshop: Workshop: 3D Content Creation for Simulated Training in XR
2022	**Reviewer**, IEEE VR 2022 Workshop: 3D Content Creation for Sim. Training (TrainingXR)

Graduate Research/Teaching Assistant

GRADUATE RESEARCH ASSISTANT

2024	**Summer**, Predicting Team Cohesion in Collaborative VR Construction Scenarios
2023	**Summer**, Multiplayer VR Construction Training Platform Using Quest Pro
2022	**Summer**, Supporting Dynamic Scene on AR Using HoloLens 2

GRADUATE TEACHING ASSISTANT

2026	**Spring**, CS551 Computer Graphics
2025	**Fall**, CS685 Autonomous Robotics
2025	**Spring**, CS452 Virtual Reality
2024	**Fall**, CS551 Computer Graphics
2024	**Spring**, CS310 Data Structures
2023	**Fall**, CS452 Virtual Reality
2023	**Spring**, CS310 Data Structures
2022	**Fall**, CS310 Data Structures
2022	**Spring**, CS211 Object Oriented Programming
2021	**Fall**, CS211 Object Oriented Programming

Volunteering

| 2022 - | **President**, Computer Science Graduate Student Association (CSGSA) | *GMU* |
| 2021 | **Volunteer**, Gradstravaganza Picnic | *GMU* |