

# Zhu Wang

Post-Doctoral Associate @ NYU · XR, HCI, AI, Robotics

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## Summary

I am a post-doctoral researcher working with *Prof. Ken Perlin* at Future Reality Lab, New York University. I received my PhD in Computer Science from NYU. My research interests span several areas including XR, HCI, robotics, and AI. More specifically, I have been working on: 1. VR-based Human balance assessment and rehabilitation with motion analysis, eye-tracking, and force-sensing technologies; 2. XR-based multi-participant collaboration and communication; 3. Interactions with mobile robots and drones; 4. Data-driven content generation and retrieval. My work has led to publications at top-tier conferences and journals, including SIGGRAPH, VRST, TEI, DIS, PLOS One, Journal of Biomechanics, with one of my publications receiving a Best Paper Award at ACM VRST 2024.

## Education

### New York University

Ph.D. in Computer Science, Advised by *Prof. Ken Perlin*

Dissertation: Virtual Reality for Human Balance Assessment

[New York, NY](#)

Sep 2015 – May 2021

### New York University

M.Sc. in Computer Science

[New York, NY](#)

Jan 2011 – Dec 2012

### Huazhong University of Science and Technology

B.Eng. in Computer Science and Technology

[Wuhan, China](#)

Sep 2006 – Jun 2010

## Experience

### New York University

Postdoctoral Associate, Future Reality Lab

[New York, NY](#)

Aug 2021 - Oct 2024

- VR-based healthcare system for human balance assessment and rehabilitation.
- Collaborated with Unity Technologies research team on zero-shot multi-modal 3D asset retrieval.
- Mentor undergraduate and graduate students, and work with them on projects including VR-based terrain generation and interaction with mobile robots and drones.

### TURN UP Multimedia Festival

Motion Capture Expert

[New York, NY & Tucson, AZ](#)

Dec 2022 - Mar 2023

- Worked with production and dance teams to integrate the dancers' real-time movements from the motion capture system into visual and interactive experiences for audiences in both New York City and Tucson to share the same musical festival.

### Microsoft Research

Research Intern, Ability Team

[Redmond, WA](#)

May 2020 - Aug 2020

- Designed and implemented XR Evaluation Toolkit, an extensible and flexible framework for XR interaction study reproduction.

### Numerati Partners

Affiliated Subject Matter Expert

[New York, NY](#)

Apr 2020 - Oct 2020

- Technical peer review and evaluation for an RGB-D scanning solution.

### New York University

Research Assistant, Future Reality Lab

[New York, NY](#)

Sep 2015 - May 2021

- Designed VR-based rehab systems for balance interventions. The systems were used by five clinics or hospitals across NYC, California and Israel.
- Designed VR-based motion analysis systems to quantify balance and estimate the risk of falling based on motion capture and machine learning.
- Jointly designed XR and MR systems for collaborative teaching and learning.
- Conducted validation studies for VR systems and investigated sensory integration for human balance.

- Designed and Developed a mixed reality system which is a VR-based tangible system combined with Oculus Rift, Optitrack and a turntable to mimic a game scene for sculpting and object manipulation in 3D space.

## Honors & Awards

Best Paper Award <a href="#">↗</a> , the 30th ACM Symposium on Virtual Reality Software and Technology	2024
Innovators in Aging Award <a href="#">↗</a> , the 2nd Annual Innovators in Aging Competition, NYU	2019
Outstanding Undergraduate <a href="#">↗</a> , Huazhong University of Science and Technology, China	2010
Third Prize <a href="#">↗</a> , National College Student Information Security Contest, Ministry of Education, China	2009

## Selected Publications

\* Equal Advising

† Equal contribution

### Conference

- [C.7] Yuhan Wang, Keru Wang, **Zhu Wang** \*, Ken Perlin \*. *Robotecture: A Scalable Shape-changing Interface Using Actuated Support Beams*. ACM TEI 2025 (will be publicly available in Dec 2024)
- [C.6] Yushen Hu, Keru Wang, Yuli Shao, Jan Plass, **Zhu Wang** \*, Ken Perlin \*. *Generative Terrain Authoring with Mid-air Hand Sketching in Virtual Reality*. Proceedings of the 30th ACM Symposium on Virtual Reality Software and Technology (VRST), 2024 [↗](#) **Best Paper Award** 🏆
- [C.5] Keru Wang, **Zhu Wang**, Ken Nakagaki, Ken Perlin. *"Push-That-There":Tabletop Multi-robot Object Manipulation via Multimodal 'Object-level Instruction'*. Proceedings of the 2024 ACM Designing Interactive Systems Conference (DIS), 2024 [↗](#)
- [C.4] Kristofer Schlachter †, Benjamin Ahlbrand †, **Zhu Wang**, Ken Perlin, Valerio Ortenzi. *Zero-shot multi-modal artist-controlled retrieval and exploration of 3d object sets*. ACM Siggraph Asia Technical Communications, 2022 [↗](#)
- [C.3] **Zhu Wang**, Liraz Arie, Anat Lubetzky, Ken Perlin. *VRGaitAnalytics: Visualizing Dual Task Cost for VR Gait Assessment*. Proceedings of the 27th ACM Symposium on Virtual Reality Software and Technology, 2021 [↗](#)
- [C.2] Moshe MH Aharoni, Anat V Lubetzky, **Zhu Wang**, Maya Goldman, Tal Krasovsky. *A Virtual Reality Four-Square Step Test for Quantifying Dynamic Balance Performance in People with Persistent Postural Perceptual Dizziness*. Proceedings of 2019 International Conference on Virtual Rehabilitation (ICVR), 2019 [↗](#)
- [C.1] Anat V Lubetzky, Jennifer Kelly, **Zhu Wang**, Makan TaghaviDilamani, Marta Gospodarek, Gene Fu, Erin Kuchlewski, Bryan Hujsak. *Head mounted display application for contextual sensory integration training: design, implementation, challenges and patient outcomes*. Proceedings of 2019 International Conference on Virtual Rehabilitation (ICVR), 2019 [↗](#)

### Journal

- [J.4] Anat V Lubetzky, Daphna Harel, Santosh Krishnamoorthy, Gene Fu, Brittani Morris, Andrew Medlin, **Zhu Wang**, Ken Perlin, Agnieszka Roginska, Maura Cosetti, Jennifer Kelly. *Decrease in Head Sway as a Measure of Sensory Integration Following Vestibular Rehabilitation: A Randomized Controlled Trial*. Journal of Vestibular Research, vol.33, no.3, pp.213-226, 2023 [↗](#)
- [J.3] Anat V Lubetzky, Jennifer L Kelly, Daphna Harel, Agnieszka Roginska, Bryan D Hujsak, **Zhu Wang**, Ken Perlin, Maura Cosetti. *Insight into postural control in unilateral sensorineural hearing loss and vestibular hypofunction*. PLoS ONE, 2022 [↗](#)
- [J.2] Anat V. Lubetzky, Jennifer Kelly, **Zhu Wang**, Marta Gospodarek, Gene Fu, John Sutera, Bryan D. Hujsak. *Contextual sensory integration training via head mounted display for individuals with vestibular disorders: a feasibility study*. Disability and Rehabilitation: Assistive Technology, 17(1), p74-84, 2022 [↗](#)
- [J.1] Anat V. Lubetzky, **Zhu Wang**, Tal Krasovsky. *Head mounted displays for capturing head kinematics in postural tasks*. Journal of Biomechanics, Volume 86, Pages 175-182, 2019 [↗](#)

### Short Paper, Workshop, Demo

- [S.7] Yuhan Wang, Keru Wang, **Zhu Wang** \*, Ken Perlin \*. *Generative Terrain Fast Prototyping in Virtual Reality with Freehand Sketching Interface*. ACM SIGGRAPH Asia XR Demo 2024 (will be publicly available in Dec 2024)
- [S.6] Keru Wang, Pincun Liu, Yushen Hu, Xiaolan Liu, **Zhu Wang**, Ken Perlin. *A Collaborative Multimodal XR Physical Design Environment*. ACM SIGGRAPH Asia XR Demo 2024 [↗](#) (will be publicly available in Dec 2024)
- [S.5] Yi Wu, Agnieszka Roginska, Keru Wang, **Zhu Wang**, Ken Perlin. *A Spatial Audio System for Co-Located Multi-Participant Extended Reality Experiences*. The 29th International Conference on Auditory Display, 2024 [↗](#)
- [S.4] Keru Wang, **Zhu Wang**, Ken Perlin. *Asymmetrical VR for Education*. ACM SIGGRAPH Immersive Pavilion, 2023 [↗](#)

- [S.3] Keru Wang, **Zhu Wang**, Karl Rosenberg, Zhenyi He, Dong Woo Yoo, Un Joo Christopher, Ken Perlin. *Mixed Reality Collaboration for Complementary Working Styles*. ACM SIGGRAPH Immersive Pavilion, 2022 [↗](#)
- [S.2] **Zhu Wang**, Anat Lubetzky, Ken Perlin. *Walking Balance Assessment with Eye-tracking and Spatial Data Visualization*. ACM Siggraph Immersive Pavilion, 2021 [↗](#)
- [S.1] **Zhu Wang**, Anat Lubetzky, Charles Hendee, Marta Gospodarek, Ken Perlin. *A Virtual Obstacle Course within Diverse Sensory Environments*. ACM Siggraph Immersive Pavilion, 2020 [↗](#)

## Teaching

### Guest Lecture

[New York University](#)

- FMTVUT-1153 Introduction to Visual Effects for Animated and Live Action Films Spring 2023
- CSCI-UA.0380-001 Interactive Computing Fall 2022
- CSCI-GA.3033-097 Special Topics in Virtual Reality Spring 2022
- CSCI-GA.2274-001 Advanced Computer Graphics Fall 2017

### Teaching Assistant

[New York University](#)

- CSCI-GA.3033-097 Special Topics in Virtual Reality Spring 2022
- CSCI-GA.2250-002 Operating Systems Spring 2018
- CSCI-GA.2274-001 Advanced Computer Graphics Spring 2022
- CSCI-GA.2274-001 Advanced Computer Graphics Fall 2017
- CSCI-GA.3033-097 Computer Graphics Fall 2015

## Mentorship

- Yi Wu, Ph.D. Candidate in Music Technology, NYU Spring 2024 – Present
- Sean Liu, Master's student in Interactive Telecommunications Program, NYU Spring 2024 – Present
- Alex Liu, Bachelor's student in Computer Science, NYU Fall 2023 – Present
- Yushen Hu, Bachelor's student in Computer Science, NYU Fall 2022 – Present
- Keru Wang, Ph.D. student in Computer Science, NYU Fall 2021 – Present
- Brayton Lordianto, Bachelor's student in Computer Science, NYU Fall 2023 – Spring 2024
- Yuhan Wang, Bachelor's student in Interactive Media Arts, NYU Shanghai Spring 2023 – Spring 2024
- Karl Rosenberg, Ph.D. student in Computer Science, NYU Fall 2021 – Spring 2022
- Cleo Xiao, Master's student in Integrated Design & Media, NYU Fall 2023
- Steven Yoo, Master's student in Integrated Design & Media, NYU Fall 2021 – Fall 2022
- Rufei Sheng, Master's student in Urban Science and Progress, NYU Spring 2019 – Fall 2019

### VIP-GY 500X/VIP-UY300X NYU Vertically Integrated Projects

[New York University](#)

Mentored 2-4 undergraduate/graduate students each semester

Fall 2021 - Present

## Invited Talks and Presentations

- Sound Design for Multi-Participant Extended Reality Experiences** 2024  
Panelist, AES Show 2024
- Enhancing HCI through Spatial Computing** 2024  
University of New Mexico (Host: Leah Buechley)
- Panel Discussion on Mixed Reality Collaboration for Complementary Working Styles** [↗](#) 2022  
Panelist, SIGGRAPH Now (Host: Derek Ham)
- Introduction to Metaverse Research and Applications** 2022  
Invited Talk, Metaverse Applications and Research Session, Toronto Youth STEM & Innovation Conference
- Human Balance Assessment Using Pressure-Sensing Technology** 2019  
The Center of Health and Rehabilitation Research Showcase, NYU
- Virtual Reality Rehabilitation for Fall Prevention** 2018  
Presentation and demo, NYU Tech Summit
- Virtual Environments, Floor Sensors and Head Sensors for Assessment of Postural Control Dysfunction** 2018  
Presentation and demo, InsurTech Science and Engineering Expo

## Skills

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**Expertise** Computer Graphics, Human-Computer Interaction, Spatial Computing, Computational Geometry, Computer Vision, Machine Learning, Robotics, Motion Capture

**Tools** Pytorch, OpenCV, Unity3D, ROS, Unreal, WebGL, WebXR

**Programming** Python, Java, JavaScript, C#, C++/C

**Languages** Chinese (Mandarin), English

## Academic Service

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### Program Committee

**IEEE** VR Workshop(2025), ICVR (2022)

**ACM** ETRA (2022-2024)

### Reviewer

**IEEE** VR (2022-2024), ISMAR (2022 - 2024)

**ACM** CHI (2021-2022), UIST (2018-2019), CSCW (2022), UbiComp/ISWC (2021-2024), TEI (2023), AutomotiveUI (2021), IDC (2021)

**Journal** BioMedical Engineering OnLine (2022)

**Others** ChinaVis (2021), IASDR (2021), WCVR (2024), EICS PACM (2023)

## Reference

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### Prof. Ken Perlin [✉](#)

Professor, Department of Computer Science, New York University

Director, Future Reality Lab, New York University [✉](#)

### Prof. Anat Lubetzky [✉](#)

Associate Professor, Department of Physical Therapy, New York University

Director, Physical Therapy Sensorimotor Lab, New York University [✉](#)

### Prof. David K.A. Mordecai [✉](#)

Adjunct Professor, School of Law, New York University

Adjunct Professor, School of Business, University of Chicago [✉](#)

Visiting Scholar, Courant Institute of Mathematical Sciences, New York University

President, Risk Economics, Inc.