Zhu Wang

Assistant Professor @ UNM CS · XR, HCI, AI, Robotics

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Summary

I am an Assistant Professor in the Department of Computer Science at the University of New Mexico. Previously, I was a post-doctoral researcher at Future Reality Lab, New York University, after completing my PhD from NYU Computer Science (advised by *Prof. Ken Perlin* ⧉). My research interests span several areas, including extended reality, human-computer interaction, robotics, and artificial intelligence. Specifically, I have been working on XR-based human balance assessment and rehabilitation with emerging technologies (e.g., motion analysis, eye tracking, and force sensing); XR-based multi-participant collaboration and communication; interactions with mobile robots and drones; and 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, ICAD, with one of the publications receiving a Best Paper Award.

Education

New York University   New York, NY
Ph.D. in Computer Science, Advisor: *Prof. Ken Perlin* ⧉   Sep 2015 – May 2021
Dissertation: Virtual Reality for Human Balance Assessment ⧉
Committee Members: *Prof. Yi-Jen Chiang* ⧉ , *Prof. Anat Lubetzky* ⧉ , *Prof. Davi Geiger* ⧉ , *Prof. David K.A. Mordecai* ⧉

New York University   New York, NY
M.Sc. in Computer Science   Jan 2011 – Dec 2012

Huazhong University of Science and Technology   Wuhan, China
B.Eng. in Computer Science and Technology   Sep 2006 – Jun 2010

Experience

University of New Mexico   Albuquerque, NM
Assistant Professor, Department of Computer Science   Aug 2025 - Now

New York University   New York, NY
Postdoctoral Associate, Future Reality Lab   Aug 2021 - Aug 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   New York, NY & Tucson, AZ
Motion Capture Expert   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   Redmond, WA
Research Intern, Ability Team   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 assessment systems to quantify human balance and estimate the risk of falling based on motion capture and machine learning.
- Designed VR-based rehab systems for balance interventions.
- Jointly designed XR and mixed-reality systems for collaborative teaching and learning.
- Conducted validation studies for VR systems and investigated sensory integration for human balance.

New York University
Junior Research Scientist, Media Research Lab

New York, NY
Mar 2013 - Feb 2014

- 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 ⧉, the 30th ACM Symposium on Virtual Reality Software and Technology   2024

Innovators in Aging Award ⧉, the 2nd Annual Innovators in Aging Competition, NYU   2019

Outstanding Undergraduate , Huazhong University of Science and Technology, China   2010

Third Prize , National College Student Information Security Contest, Ministry of Education, China   2009

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 ⧉

[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.5] Anat V Lubetzky, Maura Cosetti, Daphna Harel, Katherine Scigliano, Marlee Sherrod, **Zhu Wang**, Agnieszka Roginska, Jennifer Kelly. *Frequency analyses of postural sway demonstrate the use of sounds for balance given vestibular loss*. Gait & Posture, vol.117, pp.129-135, Mar 2025 ⧉

[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, Preprints

[S.13] Dooyoung Kim, Kangsoo Kim, Cláudio T Silva, Qi Sun, Dishita Turakhia, **Zhu Wang**, Keru Wang, Ken Perlin, Steven Feiner, Woontack Woo. *An Overview of the 1st International Workshop on Spatial Memory in XR: The Future of Memory Capture and Replay Through XR and AI (XRMemory)*. IEEE Conference on Virtual Reality and 3D User Interfaces, Abstracts and Workshops (VRW), 2025 ⊠

[S.12] 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 ⊠

[S.11] Keru Wang, Pincun Liu, Yushen Hu, Xiaoan Liu, **Zhu Wang**, Ken Perlin. *A Collaborative Multimodal XR Physical Design Environment*. ACM SIGGRAPH Asia XR Demo 2024 ⊠

[S.10] 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.9] Keru Wang, **Zhu Wang**, Ken Perlin.*Asymmetrical VR for Education*.ACM SIGGRAPH Immersive Pavilion, 2023⊠

[S.8] 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.7] **Zhu Wang**, Anat Lubetzky, Ken Perlin. *Walking Balance Assessment with Eye-tracking and Spatial Data Visualization*. ACM Siggraph Immersive Pavilion, 2021 ⊠

[S.6] **Zhu Wang**, Anat Lubetzky, Charles Hendee, Marta Gospodarek, Ken Perlin. *A Virtual Obstacle Course within Diverse Sensory Environments*. ACM Siggraph Immersive Pavilion, 2020 ⊠

[S.5] **Zhu Wang**, Anat Lubetzky, Marta Gospodarek, Makan TaghaviDilamani, Ken Perlin. *Virtual Environments for Rehabilitation of Postural Control Dysfunction*. arXiv preprint, 2019 ⊠

[S.4] Tiago Machado, Ivan Bravi, **Zhu Wang**, Andy Nealen, Julian Togelius. *Shopping for Game Mechanics*. Proceedings of the FDG Workshop, 2016 ⊠

[S.3] Tao Huang, **Zhu Wang**. *Face detection by improved AdaBoost*. Proceedings of 2nd International Conference on Computer Science and Network Technology (ICCSNT), 2012 ⊠

[S.2] **Zhu Wang**, Tao Huang, Sha Wen. *A File Integrity Monitoring System Based on Virtual Machine*. Proceedings of 2nd International Conference on Instrumentation, Measurement, Computer, Communication and Control (IMCCC), 2012 ⊠

[S.1] **Zhu Wang**. *Real-time Simulation of Infrared Scene*. Proceedings of International Conference on Image Analysis and Signal Processing (IASP), 2012 ⊠

Teaching

Instructor   University of New Mexico

- CS 412/512 Introduction to Computer Graphics   Fall 2025

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

VIP-GY 500X/VIP-UY300X NYU Vertically Integrated Projects New York University
Mentored 2-4 undergraduate/graduate students each semester Fall 2021 - Spring 2024

Invited Talks and Presentations

Bridging Modalities: Creativity and Content Generation in Spatial Computing 2025
UNM CS Colloquium

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

Tangible Mixed Reality 2013
Presentation and demo, NY Tech Meetup

Skills

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

Program Committee

IEEE	VR Workshop(2025), ICVR (2022)
ACM	ETRA (2022-2025)

Reviewer

IEEE	VR (2022-2024), ISMAR (2022 - 2025)
ACM	CHI (2021-2022), UIST (2018-2019), CSCW (2022), UbiComp/ISWC (2021-2025), TEI (2023), AutomotiveUI (2021), IDC (2021), ISS (2022)
Journal	BioMedical Engineering OnLine (2022)
Others	ChinaVis (2021), IASDR (2021), WCVR (2024), EICS PACM (2023), ISVR (2025)