Zongzhen (Jack) Yang

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Personal Website | GitHub | LinkedIn

A dedicated, detailed, and award-winning AR/VR engineer with more than six years of experience in building immersive and interactive virtual experiences. Proven talent for aligning project strategy and objectives with established and emerging mixed reality paradigms to achieve maximum operational impacts with minimum resource expenditures.

Core Competencies

- Mixed Reality Development
- Human-Computer Interaction Design
- Interactive AR/VR Experiences
- Social Computing
- Accessibility Design
- Team Collaborations

Technical Skills

C# | C++ | Python | Unity | Unreal | Leap Motion | OpenXR | OpenGL | Vulkan | DirectX | OpenCV | ARKit | ARCore | 3D Math | Blender | Git

Professional Experience

Holos Inc. February 2019 – Present
AR/VR Interaction Engineer (Unity | Leap Motion | Blender | C#) *https://holos.io/*

- Spearhead the building of an interactive, networked AR/VR content management and training simulation system, featuring hand tracking with integrated gesture recognition and simulated physics.
- Create prototypes and deploy key features, including multiplayer networking, 3D model processing, and virtual object manipulation interface; this resulted in winning a $750,000 research contract with the U.S. Air Force and being accepted into the TechStars program.
- Formulate and implement new design decisions and product directions based on user testing observations.

Microsoft Mixed Reality March 2021 – Present
Open-Source AR/VR Engineer (Unity | Leap Motion | Git | C#) *github.com/MixedRealityToolkit-Unity*

- Wrote 4,000+ lines of code to incorporate, optimize, and maintain Ultraleap (Leap Motion) hand tracking support and demonstration projects for Microsoft's Unity Mixed Reality Toolkit (MRTK).
- Partnered with developers and support personnel to handle bug fixes and repository documentation management.

Research Experience

Kats Laboratory of Applied Physics October 2017 – Present
AR/VR Researcher (Matlab | Unity | OpenGL | OpenXR) *Madison, WI*

- Devise chromatic adjustment algorithms with computer vision techniques on hyperspectral images to simulate color blindness.
- Create and program virtual reality simulations to visualize research findings through color-calibrated Oculus Head Mounted Display (HMD), leading to practical design implications for potential human vision enhancement optical lenses.
- Accelerate development of an artificial intelligence algorithm to replicate human behavior during color vision deficiency tests such as Farnsworth-Munsell 100 Hue Test and D-15 Test; subsequently examine the accuracy of chromatic adjustment with 90% confidence.

University of Wisconsin Computer Graphics Lab September 2019 – May 2020
Graphics Researcher (Unity | C++ | OpenGL) *Madison, WI*

- Constructed a virtual reality teleoperation system where users could remotely control robots via hand and arm gestures by passing ROS data between Unity and robot through network socket with little latency.
- Crafted a motion playback system with an intuitive user interface to dynamically replicate virtual robot arm movement; this was accomplished by interpolating robotic data from experiments in Unity that were used to analyze more than 15 lab experiments.

University of Wisconsin HCI Group, People and Robots Lab April 2017 – November 2017
Research Assistant (C | Python | Raspberry Pi) *Madison, WI*

- Designed and built a collaborative filtering recommender system for children's reading companion robots, resulting in a successful trial with eight families.
- Teamed effectively with mechanical engineering students to add speech recognition to robots using NLP techniques.

Teaching & Advising Experience

CS 559: Computer Graphics Fall 2019 & Spring 2020
Teaching Assistant (THREE.js | OpenGL | GLSL | Git) *Madison, WI*

- Mentored 350+ students for two semesters; offered comprehensive tutoring on course content and assignments.
- Cooperated with head faculty members to design engaging classroom materials; graded more than 550 student projects.

Projects

Virtualso January 2020 – Present
Founder & Developer (Unity | OpenXR | C++ | C#) *Madison, WI*

- Develop virtual reality interview simulation; this involves users being interviewed by customizable conversational humanoid agents capable of making emotion-driven facial expressions and body gestures using Natural Language Processing (NLP) techniques.
- Implement a realistic virtual reality speech trainer where users upload their own slides and present to a room of artificial intelligent audiences capable of reacting via body gestures and eye contact.
- Receive very positive feedback from business school students who used the simulation to practice for job interviews and presentations.

PolySpace VR September 2020 – August 2021
Founder & Developer (Unity | Photon Networking | OpenXR) *github.com/Poly-Space-VR*

- Established and developed PolySpace VR, an open-source virtual reality social platform that promotes small virtual gatherings and minimal latency performance across devices, where players are encouraged to create and submit their own spaces to be featured.
- Published and received positive reviews on the Oculus Store; garnered more than 1,000 downloads and 350+ active users.

University of Wisconsin Course Enrollment App January 2018 – June 2018
UX Researcher (Tobii Eye Tracking | Morae | InVision) *enroll.wisc.edu*

- Planned and conducted user research with 20+ participants including interviews, usability testings, and field studies.
- Coordinated with project managers and web developers to interpret research findings into actionable improvements, resulting in successful launch of the website which is used by over 9,000 students each year.

PUBLICATIONS

Accepted

- J. Salman, M. Gangishetty, B. Rubio-Perez, D. Feng, Z. Yu, **Z. Yang**, C. Wang, A. Shahsafi, D. Congreve, M. A. Kats, "Passive frequency conversion of ultraviolet images into the visible using perovskite nanocrystals," Journal of Optics, Vol. 23, No. 5, 054001 (2021)

In Preparation

- **Z.Yang***, B. Rubio-Perez*, J. Salman, M.Frising, M. A. Kats, "Monte Carlo Simulations of the Farnsworth-Munsell 100 Hue Color Vision Test for Anomalous Trichromatic and Dichromatic Observers," (Spring 2022)
- **Z.Yang**, B. Rubio-Perez, M. A. Kats, "Breaking Binocular Redundancy Through Virtual Reality," (Winter 2021)

Other

- Featured in: Cameron, Mike, "Effective Leaders: Four Attributes That Underpin The Core Characteristics of Effective Leadership," SpiritCast Network (2021)

LEADERSHIP ROLES

UpNote February 2017 - January 2020
Founder (Flutter | Firebase | Dart) *Madison, WI*

- UpNote is a B2C platform that enables venues and individuals to democratize music playlists and capture data on music preferences by allowing users to nominate songs through integration with their music streaming service of choice.
- Led a team of 3 developers to create a minimal viable product and recruited 4 local bars to participate in alpha testing.

CONFERENCES

- **Presenter & Exhibitor,** "Holos - the future of no-code, VR Training creation, and deployment," I/ITSEC 2021
- **Volunteer & Participant**, IEEE VR 2020 & 2021
- **Poster,** "Robot-assisted Reading among Elementary and Middle School Children," WISCIENCE Entering Research 2017

EDUCATION

University of Wisconsin-Madison | B.A. in Computer Science & B.A in Communication Arts August 2016 – June 2020
Carnegie Mellon University | National High School Game Academy May 2015 – August 2015
Seton Hall Preparatory School | National Honor Society member August 2013 – May 2016

CERTIFICATIONS

University of California San Diego | Interaction Design Specialization (*In Progress*)
University of California San Diego | VR Development Professional Certificate
Georgia Tech | Human-Computer Interaction Professional Certificate
University of London | Virtual Reality Specialization
Udacity | Computer Vision Nanodegree