# Lei Zhang

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## Research Interests

Human-Computer Interaction, Virtual/Augmented Reality, Authoring Tools

## Education

**University of Michigan, Ann Arbor** — *Ann Arbor, MI, USA.*
PH.D. IN INFORMATION SCIENCE — *2018 - present*
Advisor: Steve Oney

**Shanghai Jiao Tong University** — *Shanghai, China.*
B.E. IN SOFTWARE ENGINEERING — *2014 - 2018*
Supervisors: Xubo Yang and Shuangjiu Xiao

## Publications

[C3] **Lei Zhang**, Steve Oney. 2020. FlowMatic: An Immersive Authoring Tool for Creating Interactive Scenes in Virtual Reality. To appear in Proceedings of the ACM symposium on user interface software and technology (UIST 2020). ACM, New York, NY, USA, 10 pages.

[C2] **Lei Zhang**, Steve Oney. 2019. Studying the Benefits and Challenges of Immersive Dataflow Programming. IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC 2019). Memphis, TN, USA. October 14–18. **(Best Short Paper Award)**

[C1] Ziang Xiao, Helen Wauck, Zeya Peng, Hanfei Ren, **Lei Zhang**, Shiliang Zuo, Yuqi Yao, and Wai-Tat Fu. 2018. Cubicle: An Adaptive Educational Gaming Platform for Training Spatial Visualization Skills. In 23rd International Conference on Intelligent User Interfaces (IUI 2018). ACM, New York, NY, USA, 91-101.

## Research Experience

**University of Michigan, Ann Arbor** — *Ann Arbor, MI, USA.*
GRADUATE STUDENT RESEARCH ASSISTANT — *Sept. 2018 - present*

- Designed and developed an immersive authoring tool in Virtual Reality using AFRAME and Three.js. [C2, C3]
- Enabled users to implement behaviors of objects using visual programming languages including dataflow programming and functional reactive programming in Virtual Reality.
- Conducted a series of user studies on the benefits and challenges of the immersive dataflow programming tool. [C2]

**University of Illinois at Urbana-Champaign** — *Urbana, IL, USA.*
RESEARCH INTERN | SUPERVISOR: WAI-TAT FU — *Jul. 2017 - Sept. 2017*

- Developed a free-hand sketching interface and integrated it into the online platform for training spatial visualization skills based on Unity webGL and Django, enhancing the usability of the existing online platform.
- Designed and developed one of the modules of an educational gaming platform called “Cubicle” [C1] for training spatial visualization skill using Unity.

**Shanghai Jiao Tong University** — *Shanghai, China.*
RESEARCH ASSISTANT | SUPERVISORS: XUBO YANG AND SHUANGJIU XIAO — *Oct. 2016 - Jul. 2018*

- Implemented an AR guidance system for assembly tasks on the HoloLens.
  - Used vision-based methods to achieve the markerless registration of 3D models on the HoloLens.
  - Designed and implemented a step-by-step tutorial based on 3D animation and the interactions between the user and the system using gestures and voice commands.
- Created an AR broadcasting system with multimodal interactions using Unity.
  - Implemented the calibration between a camera and a Microsoft Kinect using methods of checkerboard calibration.
  - Captured and filtered the camera data from the HD camera in Unity using the video capture card’s SDK.
  - Designed and developed the interactions between users and virtual objects based on gestures and voice commands using Kinect.

## Honors & Awards

2019 **Best Short Paper Award**, VL/HCC 2019 *Memphis, TN, USA.*

2017 **Rong Chang Science and Technology Innovation Scholarship (Top 30)**, Shanghai Jiao Tong University *Shanghai, China.*

2017 **Academic Excellence Scholarship**, Shanghai Jiao Tong University *Shanghai, China.*

## Academic Service

**Reviewing** | CHI '19, TEI '19

**Student Volunteer** | UIST '19

## Teaching

**University of Michigan, Ann Arbor** *Ann Arbor, MI, USA.*

Graduate Student Instructor *Winter 2020*

SI 659 - Developing AR/VR Experiences

**University of Michigan, Ann Arbor** *Ann Arbor, MI, USA.*

Graduate Student Instructor *Fall 2019*

SI 422 - Needs Assessment and Usability Evaluation

## Skills

**Programming:** Typescript/Javascript, C#, C/C++, Python, Java (Android development)

**VR/AR Development:** Unity, AFRAME/Three.js, Oculus Rift/Quest, HoloLens, HTC VIVE, Kinect

**Graphics and Vision:** GLSL, WebGL, OpenGL, OpenCV, PyTorch

## Miscellaneous

**Languages:** English (Professional), Mandarin (Native), Cantonese (Native)

**Music:**

- The 5th place in the "Top 10 Singers of Campus" Musical Contest in Shanghai Jiao Tong University
- Original Musician on Netease Music Platform
- Studio Kits: Ableton Live, Cubase, Adobe Audition