

# BINGJIAN HUANG

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Dynamic Graphics Project Lab (DGP), Department of Computer Science, University of Toronto

## EDUCATION

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### Ph.D. in Human-Computer Interaction

2020-Present

*Dynamic Graphics Project Lab (DGP), University of Toronto, Ontario, Canada*

Advisor: Prof. Daniel Wigdor

### B.E. in Computer Science and Technology — GPA 3.67/4.00

2016-2020

*Tsinghua University, Beijing, China*

### Minor in Finance and Entrepreneurship — GPA 3.81/4.00

2017-2020

*Tsinghua University, Beijing, China*

## PAPERS

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### A Study of 2D Funnelling Illusion and Spatial Localization Accuracy of Vibrotactile Stimuli on the Forearm

*Bingjian Huang, Daniel Wigdor*

*CHI 2022 (submission in review)*

### User Burden of Microinteractions: An In-lab Experiment Examining User Performance and Perceived Burden Related to In-situ Self-reporting

*Xinghui Yan, Yuxuan Li, Bingjian Huang, Sun Young Park, Mark W Newman*

*MobileHCI 2021*

### Toward Lightweight In-situ Self-reporting: An Exploratory Study of Alternative Smartwatch Interface Designs in Context

*Xinghui Yan, Shriti Raj, Bingjian Huang, Sun Young Park, Mark W Newman*

*IMWUT (UBICOMP) 2020*

### Designing and Evaluating Hand-to-Hand Gestures with Dual Commodity Wrist-Worn Devices

*Yiqin Lu, Bingjian Huang, Chun Yu, Guanhong Liu, Yuanchun Shi*

*IMWUT (UBICOMP) 2019*

## RESEARCH EXPERIENCE

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### Graduate Research Assistant

2020.8-Present

*Dynamic Graphics Project Lab (DGP), University of Toronto, Advisor: Prof. Daniel Wigdor*

- Apply phantom sensations (e.g., Funnelling Illusion) to improve on-body haptic feedback
- Literature review on Virtual Reality / Augmented Reality
- Explore multi-sensory perception in virtual environments
- Explore beyond-reality interactions in virtual environments

### Undergraduate Research Assistant

2018.10-2019.11

*Pervasive Computing Group, Tsinghua University, Advisors: Prof. Yuanchun Shi, Prof. Chun Yu*

- Researched on hand-to-hand gesture design space exploration and smartwatch recognition.
- Interviewed 10 people and surveyed 24 people about gesture preference.
- Collected raw IMU sensor data, extracted features, trained SVM & LSTM Pytorch models.
- Developed a real-time gesture recognition system, validated in daily scenarios.
- Revised paper and added real-context experiments based on major revision review

### Visiting Scholar and Research Intern

2019.7-2019.9

*Interaction Ecologies Group, School of Information, University of Michigan, Ann Arbor,*

*Advisors: Prof. Mark W. Newman, Prof. Sun Young Park*

- Researched on in-situ low-burden self-reporting tools.
- Developed 11 Android smartwatch self-reporting prototypes to investigate different design concepts.

- Conducted user studies about scenarios and techniques with User Enactment Method.

#### **Undergraduate Research Assistant**

2018.3-2018.9

*Pervasive Computing Group, Tsinghua University, Adviser: Prof. Yuanchun Shi, Prof. Chun Yu*

- Developed a 3D Telepresence software framework aiming to reach high co-presence.
- Used CUDA to implement parallel algorithms such as TSDF and Marching Cubes.
- Conducted user experiments and interviewed participants

#### OUTSTANDING COURSE PROJECTS

##### **Virtual Reality Android Applications on Google Cardboard**

2019.9-2020.1

Course: *Virtual Reality Technology*

- Build Maze with Google Android VR SDK, using OpenGL and ViroCore
- Build stereo sound App with HRTF algorithm
- Build VR Pokemon GO game with Leap Motion and Unity

##### **Mid-air Typing Prototype and User Study**

2018.9-2019.1

Course: *Human Computer Interaction Theory and Technology*

- Designed novel hand input methods without keyboards
- Created algorithms to detect hand gestures and movements using Leap Motion
- Conducted user studies to test accuracy, speed and learning curve

##### **Progressive Photon Mapping(PPM) Rendering Algorithm**

2018.3-2018.6

Course: *Fundamentals of Computer Graphics*

- Rendered images of virtual 3D space using rendering algorithms such as Ray Tracing and Progressive Photon Mapping

#### SKILLS

**Programming Languages:** C/C++/Python/Java

**Programming Tools:** MATLAB/Qt/UnityVR/CUDA/PyTorch/Android Studio/Raspberry Pi

**Languages:** English(TOFEL 115 (speaking: 25), GRE 159+170+3.5)

#### RESEARCH INTERESTS

**VR/AR/MR**, novel input methods and future user interfaces

**Human Perception and Illusion** and how they affects user experience in virtual environments

**Wearable Computing** with smartwatch, smart rings and smart clothes

#### HONORS AND AWARDS

**Wolfond Fellowship (\$20,000, \$10,000 each year)**, University of Toronto

September, 2020

**GPHL Scholarship for Academic Excellence(Top 20%)**, Tsinghua University

September, 2019

**SOHU Scholarship for Academic Excellence(Top 10%)**, Tsinghua University

September, 2017

**2nd Prize**, National Olympiad in Informatics in Provinces(NOIP)

November, 2014

#### MISCELLANEOUS

**Sports Enthusiast:** Basketball, High Diving, Ski, Hiking