Bingjian Huang

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

Education

Ph.D. in Human-Computer Interaction *2020-Present*
Dynamic Graphics Project Lab (DGP), University of Toronto, Ontario, Canada
Supervisor: 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

Investigating the Effect of Intensity and Frequency on Vibrotactile Localization Accuracy
***Bingjian Huang**, Paul H. Dietz, Daniel Wigdor*
IEEE Transactions on Haptics 2024

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) 2020

Research Experience

Graduate Research Assistant *2020.8-Present*
Dynamic Graphics Project Lab (DGP), University of Toronto, Advisor: Prof. Daniel Wigdor

- Build high-resolution vibrotactile haptic suit
- Measure haptic perception and multi-sensory perception in VR
- Apply phantom sensations to improve haptic feedback resolution
- 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/Rapberry Pi

Electronic Hardware: PCB Design/3D Modeling/Microcontroller Coding

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