

# LIANG HE

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## RESEARCH STATEMENT

I create novel design techniques and build interactive systems to provide support for creativity, interactivity, and accessibility. Specifically, I primarily **study mechanical mechanisms for the digital fabrication of kinetic objects, develop intelligent design workflows for the integration of electronics into fabricated artifacts, and explore fabrication-assisted designs for the improvement of accessibility**. In my research, I apply an interdisciplinary approach: (i) investigating mechanical, material, and electronic properties to inform novel design techniques; (ii) developing design techniques and systems to enable design and customization; and (iii) driving application domains using design techniques and systems.

## EDUCATION

- Present     **PhD student, Computer Science & Engineering**, University of Washington
- 2017     **PhD student, Computer Science**, University of Maryland, College Park  
Area: digital fabrication, TUI, HCI; Advisor: Prof. Jon E. Froehlich
  
- 2015     **MS, Computational Design**, Carnegie Mellon University, Pittsburgh  
Area: TUI, HCI; Thesis advisor: Eric Brockmeyer  
MS Thesis: *SqueezeAPulse - Adding Interactive Input Using Passive Pulses of Air*
  
- 2013     **MS, Computer Science and Technology**, UCAS, Beijing  
Area: TUI, HCI; Advised by Prof. Danli Wang  
MS Thesis: *A Tangible Approach for Storytelling*
  
- 2010     **BEng, Software Engineering**, Beihang University (BUAA), Beijing

## HONORS AND AWARDS

- 2020     **Special Recognition**, CHI 2020 paper review
- 2019     **Winner**, CHI'19 SV t-shirt design contest
- 2018     **Finalist**, Amazon Catalyst Award
- 2017     **Best Paper Award**, CHI'17
- 2016     **Conference Travel Funding**, Department of Computer Science, UMD
- 2016     **Best Late-Breaking Work Paper Award**, CHI'16
- 2015/16   **Dean's fellowship**, Department of Computer Science, UMD
- 2014     **Conference Travel Funding**, School of Architecture, CMU
- 2013/14   **Department Scholarship**, School of Architecture, CMU
- 2014     **Most Creative Award**, UIST'14 Student Innovation Contest
- 2015     **Honorable Mentions Award**, CHI'15
- 2015     **Winner**, CHI'15 SV t-shirt design contest
- 2012     **Winner**, G-Startup 2012 Seed Stage, Global Mobile Internet Conference'12

2011 **Follow-up**, Software Design, Microsoft Imagine Cup Local Final  
2009 **China National Scholarship** (Top 1%)

## PROFESSIONAL EXPERIENCE



- Summer 2019 **HP Labs**, *Palo Alto, CA*  
Research Intern, Artificial Intelligence & Emerge Computing Lab  
Mentored by Rafael ‘Tico’ Ballagas.
- 2017 – 2019 **University of Washington**, *CSE, Seattle, WA*  
Graduate Research Assistant.  
Advised by Prof. Jon E. Froehlich.
- Summer 2016 **Microsoft Research**, *Redmond, WA*  
Research Intern. VIBE Group  
Mentored by Rob DeLine and Saleema Amershi.
- 2015 – 2017 **University of Maryland**, *CS Department, College Park, MD*  
Graduate Research Assistant.  
Advised by Prof. Jon E. Froehlich.
- Summer 2014 **KEIO-NUS CUTE Center**, *Singapore*  
Research Intern.  
Advised by Prof. Ellen Yi-Luen Do and Prof. Beryl Plimmer.
- Spring 2014 **Art Fab**, *School of Architecture, Carnegie Mellon University, PA*  
Graduate Research Assistant.  
Advised by Prof. Ali Momeni.
- 2010 – 2013 **HCI Lab**, *Institute of Software, Chinese Academy of Sciences, Beijing*  
Research Assistant.  
Advised by Prof. Danli Wang.
- Spring 2010 **Microsoft Research Asia**, *Beijing*  
Part-time Student Intern. University Relationship Group  
Mentored by Bei Li.

## REFEREED JOURNAL PUBLICATION

- 2014 [J.1] Wang, D., **He, L.**, and Dou, K. StoryCube: Supporting Children's Storytelling with a Tangible Tool. *The Journal of Supercomputing*, Volume 70 Issue 1, Pages 269-283. Springer. 2014.

## REFEREED CONFERENCE PUBLICATIONS


- 2019 [C.05] **He, L.**, Peng, H., Lin, M., Konjeti, R., Guimbretière, F., and Froehlich, J. Ondulé: Designing and Controlling 3D Printable Springs. To appear at *UIST'19*.

- 2017 [C.04] Kazemitabaar, M., McPeak, J., Jiao, A., **He, L.**, Outing, T., and Froehlich, J. **MakerWear: A Tangible Approach to Interactive Wearable Creation for Children.** In *Proceedings of the 35th annual ACM conference on Human factors in computing systems (CHI'17)*. Denver, CO, USA, May 6-11, 2017. [Acceptance Rate: 25%]  
 **Best Paper Award [Top 1%]**
- [C.03] **He, L.**, Laput, G., Brockmeyer, E., and Froehlich, J. **SqueezaPulse: Adding Interactive Input to Fabricated Objects Using Corrugated Tubes and Air Pulses.** In *Proceedings of the ACM symposium on tangible and embodied interaction (TEI '17)*. [Acceptance Rate: 27%]
- 2015 [C.02] Cheng, K., **He, L.**, Meng, X., Shamma, D., Thangpalam, A., and Nguyen, D. **CozyMaps: Real-time Collaboration on a Shared Map with Multiple Displays.** In *Proceedings of the 17th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI'15)*. Copenhagen, Denmark, August 24-27, 2015. [Acceptance Rate:25.2%]
- [C.01] Plimmer, B., **He, L.**, Zaman, T., Karunanayaka, K., Yeo, A., Jengan, G., and Do, E. **New Interaction Tools for Preserving an Old Language.** In  *Proceedings of the 33rd annual ACM conference on Human factors in computing systems (CHI'15)*. Seoul, Korea, April 18-12, 2015. [Acceptance Rate: 23%]  
**Honorable Mentions Award**

## REFEREED EXTENDED ABSTRACTS/POSTERS

- 2020 [EA.03] **He, L.**, Wang, R., Xu, X. **PneuFetch: Supporting Blind and Visually Impaired People to Fetch Nearby Objects via Light Haptic Cues.** To appear at CHI 2020 EA.
- 2019 [P.07] Potluri, V., **He, L.**, Chen, C., Froehlich, J., and Mankoff., J. **A Multi-Modal Approach for Blind and Visually Impaired Developers to Edit Webpage Designs.** In *The 21st International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '19)*. Pittsburgh, PA, Oct 28-30, 2019.
- 2017 [P.06] **He, L.**, Wan, Z., Findlater, L., and Froehlich, J. **TacTILE: A Preliminary Toolchain for Creating Accessible Graphics with 3D-Printed Overlays and Auditory Annotations.** In *Poster Proceedings of the 19th International ACM SIGACCESS Conference on Computers & Accessibility (ASSETS'17)*. Baltimore, MA, Oct 30 – Nov 1, 2017.
- [P.05] **He, L.**, Peng, H., Land, J., Fuge, M., and Froehlich, J. **Designing 3D-Printed Deformation Behaviors Using Spring-Based Structures: An Initial Investigation.** In *Adjunct Proceedings of the 30th Annual ACM*

*Symposium on User Interface Software and Technology (UIST'17)*.  
Quebec City, Canada, October 22–25, 2017.

- [P.04] **He, L.**, Land, J., Peng, H., Fuge, M., and Froehlich, J. Early Exploration of Deformable Interactive Designs with 3D-Printed Springs. In *Proceedings of the 1st Annual ACM Symposium on Computational Fabrication*. Cambridge, Massachusetts, June 12-13, 2017.
- 2015 [P.03] **He, L.**, Xu, C., Xu, D., and Brill, R. PneuHaptic: Delivering Haptic Cues with a Pneumatic Armband. In *Proceedings of the 19th International Symposium on Wearable Computers (ISWC'15)*. Osaka, Japan, September 7-11, 2015. [Acceptance Rate: 25%]
- 2012 [P.02] Wang, D., Zhang, Y., Gu, T., **He, L.**, and Wang, H. E-Block: A Tangible Programming Tool for Children. In *Adjunct Proceedings of the 25th Annual ACM Symposium on User Interface Software and Technology (UIST'12)*. Cambridge, Massachusetts, October 7–10, 2012.
- [P.01] **He, L.**, Li, G., Zhang, Y., Wang, D., and Wang, H. TempoString: A Tangible Tool for Children’s Music Creation. In *Proceedings of the 14th International Conference on Ubiquitous Computing (UbiComp'12)*. Pittsburgh, September 5–8, 2012.
- 2016 [EA.02] Kazemitabaar, M., **He, L.**, Wang, K., Aloimonos, C., Cheng, T., and Froehlich, J. ReWear: Early Explorations of a Modular Wearable Construction Kit for Young Children. In *Proceedings of CHI '16 Extended Abstracts on Human Factors in Computing Systems*. [Acceptance Rate: 43%]  
 **Best Paper Award [Top 1%]**
- [EA.01] Du, R. and **He, L.** VRSurus: Enhancing Interactivity and Tangibility of Puppets in Virtual Reality. In *Proceedings of CHI '16 Extended Abstracts on Human Factors in Computing Systems*. [Acceptance Rate: 43%]

## PATENT

- 2013 [PA.01] “A Method and System for Children’s Tangible Storytelling”. Patent No.: 2013100129910. 2013.

## SOFTWARE COPYRIGHT

- 2010 [SC.01] “InkSound: A Pen-based System for Chinese Traditional Painting.” 2010.

## THESES

- 2015 [T.02] **He, L.** (2013) “SqueezaPulse - Adding Interactive Input Using Passive

Pulses of Air”. Master’s Thesis. Carnegie Mellon University.

- 2013 [T.01] **He, L.** (2010) “A Tangible Approach for Storytelling”. Master’s Thesis. University of Chinese Academy of Sciences.

## TALKS

- 2019 [TA.07] HCI Lunch Talk. Stanford, CA, September 25th, 2019.  
[TA.06] Lightning Talk. UW CSE/MSR Summer Institute – Future of Fabrication, Blaine, WA, July 23th, 2019.
- 2018 [TA.05] UW CSE Colloquia – Computational Fabrication, Seattle, WA, 2018.  
[TA.04] Industry Affiliates Research Day at UW, Seattle, WA, 2018.
- 2017 [TA.03] Industry Affiliates Research Day at UW, Seattle, WA, 2017
- 2016 [TA.02] Tech+Design: Interaction Design for a Purpose, UMD, College Park, MD, 2016.  
[TA.01] HCIL’s 33rd Annual Symposium, UMD, College Park, MD, 2016.

## GUEST LECTURE/WORKSHOP

- 2019 [GL.02] CSE 440A: Introduction to HCI – “Heuristic Evaluation”. Computer Science & Engineering, University of Washington, Seattle, WA, 2019.
- 2018 [W.02] CSE SkillShare Workshop – “Video Making”. Computer Science & Engineering, University of Washington, Seattle, WA, 2018.  
[W.01] CSE 590A: UbiComp – “3D Modeling with Fusion 360”, Computer Science & Engineering, University of Washington, Seattle, WA, 2018.  
[GL.01] HCID 521 – “Laser Cutting”, Human-Computer Interaction & Design, University of Washington, Seattle, WA, 2018.

## TEACHING

- 2019 [TE.08] **CSE 599U: Prototyping Interactive Systems.** Computer Science & Engineering, University of Washington, Seattle, WA, 2019.  
[TE.07] **CSE 440A: Introduction to HCI.** Computer Science & Engineering, University of Washington, Seattle, WA, 2019.
- 2018 [TE.06] **CSE 440A: Introduction to HCI.** Computer Science & Engineering, University of Washington, Seattle, WA, 2018.  
[TE.05] **CSE 590A: Ubiquitous Computing.** Computer Science & Engineering, University of Washington, Seattle, WA, 2018 (co-build with Jon E.

Froehlich).

- [TE.04] **HCID 521: Prototyping Studio.** Computer Science & Engineering, University of Washington, Seattle, WA, 2018 (co-build with Jon Froehlich and Jennifer Mankoff).
- 2016 [TE.03] **CMSC 250: Discrete Structures.** Department of Computer Science. University of Maryland, College Park, MD, 2016.
- [TE.02] **CMSC 132: Object-Oriented Programming II.** Department of Computer Science. University of Maryland, College Park, MD, 2016.
- 2015 [TE.01] **CMSC 131: Object-Oriented Programming I.** Department of Computer Science. University of Maryland, College Park, MD, 2015.

## STUDENT ADVISING AND MENTORSHIP

### University of Washington, Seattle, WA

#### *Undergraduate & Graduate Research Advisees*

- 2020 Yawen Zheng (undergrad; Media Art; Tsinghua University)
- 2020 Yuebing Liang (MS; Architecture; Tsinghua University)
- 2020 Soumya Jindal (MS; Human Centered Design & Engineering)
- 2020 Lily Zhao (undergrad; Computer Science & Engineering)
- 2019 Ofek Inbar (undergrad; Computer Science & Engineering)
- 2019 Jessica Chin (undergrad; Computer Science & Engineering)
- 2019 Sophie Tian (undergrad; Computer Science & Engineering)
- 2019 Michelle Lin (undergrad; Computer Science & Engineering)

### University of Maryland, College Park, MD

#### *Undergraduate Research Advisees*

- 2017 Joshua Land (Mechanical Engineering)

## PROFESSIONAL ACTIVITIES/SERVICE

- Reviewer DIS'20, UIST'19, CHI'16 – '20, WAC'19, TEI'17 – '18, IDC'17, MobileHCI'16s
- Volunteer TEI'17, CHI'14 – '15, UIST'14, China Symposium on HCI
- Program Committee CHI'19, '20 LBW
- Conference Organizer Web Co-chair, UIST'19

## PROFESSIONAL SKILLS

- HCI Research Interview, survey, usability testing, qualitative & quantitative analysis

Programming C/C++, C#, Java, JavaScript, XHTML, CSS, iOS, Python, SQL  
Hardware/Tools CAD/CAM, digital prototyping, PCB making, hand tools  
Design Adobe Creative Suite, Rhinoceros, Eagle, Sketching  
Other Painting, graphic design, calligraphy