

# HANFEI REN

<http://hanfei.ren>

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## EDUCATION

<b>University of California, Berkeley</b> , M.Eng. in Electrical Engineering and Computer Science	<b>Expected 05/19</b>
<b>Zhejiang University</b> , B.Eng. in Digital Media Technology & B.Eng. in Industrial Design, <i>GPA: 3.88</i>	<b>09/14-06/18</b>
<b>National University of Singapore</b> , Exchange Student in Computer Science, <i>GPA: 4.00</i>	<b>01/17-05/17</b>

## SKILLS

**Programming:** Python, C/C++, SQL, Java, Matlab, Linux, HTML, CSS, JavaScript

**Frameworks:** Android, Flask, Django, OpenCV, OpenGL, Unity, Caffe, TensorFlow, Arduino, Qt

**Design:** Web Design, Mobile Design, Game Design, Interaction Design

**Method:** User Research, Prototyping, Usability Testing

## EXPERIENCE

**Research Assistant**, Cascade Lab, University of Illinois, Urbana-Champaign, IL **07/17-09/17**  
*Game Development & User Research*

- Developed an adaptive educational gaming platform called *Cubicle* to train students' spatial visualization skills with Unity.
- Demonstrated that *Cubicle* can effectively develop students' spatial ability and motivate them to train visualization skills.
- **Publication:** Ziang Xiao, Helen C Wauck, Zeya Peng, [Hanfei Ren](http://hanfei.ren), Lei Zhang, Shiliang Zuo, Yuqi Yao, Wai-tat Fu. 2017. *An Adaptive Educational Gaming Platform for Training Spatial Visualization Skills. the 23rd International Conference on Intelligent User Interfaces.*

**Research Assistant**, National University of Singapore **01/17-05/17**  
*Backend Development & User Research*

- Developed a RESTful API with Flask and PostgreSQL for a food logging and recommendation app named *TasteHealthy*.
- Built health evaluation and intake recommendation functions by reference to *Krause's Food and Nutrition Care Process*.
- Implemented a function for nutrition value retrieval based on Nutritionix API and a Singapore government food database.

**Research Assistant**, CAD & CG State Key Lab, Zhejiang University **11/16-03/17**  
*Data Visualization & Algorithm Research*

- Collected news data by Scrapy from ACM news, Wired, LinkedIn and certain Wechat official accounts.
- Extracted topics by word frequency counting and natural language processing using LDA and word2vec algorithms.
- Developed interactive heatmaps on geographical maps to indicate regional popular topics and top keywords.

## PROGRAMMING PROJECTS

**Vision Correcting Displays**, University of California, Berkeley, *Advisor: Brian A. Barsky* **08/18-Present**

- Proposed a computational solution that modifies the optics of electronic displays to correct refractive visual aberrations.
- Improved and extended original algorithms to correct high-order visual aberrations using Zernike polynomials with C++.
- Conducted experiments to explore objective and subjective metrics of image quality, and decided display metrics.

**AI Research, Developed image retrieval systems and body measurement system**, Zhejiang University **02/18-06/18**

- Developed image retrieval systems for clothing and fabrics with OpenCV and Caffe that achieved accuracy of 98%.
- Designed and developed an intelligent human body measurement system being used by over 2,200 users with TensorFlow.

**Mobile Development & User Research, Developed an app for stray animals**, Zhejiang University **06/17-07/17**

- Designed and developed a mobile app to track and help stray animals on campus by crowdsourcing, named *Petopia*.
- Interviewed with student animal lovers and school animal protection association to establish requirements.
- Built personas and scenarios to validate the interaction of using *Petopia* to track and fund stray animals.
- Developed a RESTful API with Flask and PostgreSQL for data access to animals and users.

**VR Game Development, Developed a VR horror game**, Zhejiang University **06/17-07/17**

- Developed a VR horrible game with Unity and Oculus named *Hopeless Hospital* set in an abandoned general hospital.
- Employed Maya for modelling and used Photoshop for visual design.

**Interactive Device Design & Android Development, Designed an interactive light**, Zhejiang University **06/17-07/17**

- Designed and built an interactive touch light integrated with an audio player using Arduino.
- Developed an Android app to record the music played by the light, control the illuminance and play music via the light.

**Signal Processing & Android Development, Amended motion trajectory**, National University of Singapore **03/17-05/17**

- Determined errors of GPS and accelerometer of a phone using readings recorded by self-developed Android apps.
- Implemented Kalman filter to derive a more accurate trajectory of motion from the phone readings and determined errors.

**Game Development, Developed a video game**, National University of Singapore **03/17-05/17**

- Developed an action game inspired by minigames like mine-sweeping and chess with UE4, named *Trick Tower*.

**Android Development, Developed an app for the Internet of streetlights**, Zhejiang University **03/17-04/17**

- Designed and developed a mobile app for electricians to track and update the conditions of streetlights.

**Computer Graphics, Developed an escape room game**, Zhejiang University **05/16-06/16**

- Designed and developed an escape room game for players to explore a locked room and figure out the password to escape.
- Implemented navigation, mouse picking, illumination and texture mapping for the game with OpenGL.

**Image Processing, Developed image editing tools**, Zhejiang University **11/15-01/16**

- Developed an image editing tool with graphic user interface using Matlab for basic image processing including edge detection, equalization, DCT compression, blurring, sharpening, and adjustment of contrast, brightness and saturation.
- Used Qt to implement another image editing application with similar functions as above.

## **DESIGN PROJECTS**

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**Speculative Design & Food Design, Redesigned a traditional Chinese dessert**, Zhejiang University **06/17-07/17**

- Redesigned a traditional Chinese dessert called Dingshenggao by incorporating the mechanism of Scrabble.
- Integrated the similar effect of indirect comfort as well as blessings buried in Dingshenggao and Chinese characters into design and applied Chinese typography to the shape of the dessert.

**Product Design & User Research, Designed a selfie camera and a visual platform**, Zhejiang University **04/17-11/16**

*CASIO Industry-University Collaboration Program with International Design Institute of Zhejiang University*

- Designed a sphere panorama camera with certain attachments that could be remote controlled from smart phones.
  - Led user research through interviews and analysis on popular selfies, and identified brilliant photo composition and unconstrained shooting methods as design opportunities.
  - Built persona and scenarios to validate the interaction process. Made prototypes by Sketch, Rhinoceros and Keyshot.
- Designed a visual communication platform based on a digital mirror to foster intimate relationships.
  - Conducted user research on communication problems to focus on uneasy relationships caused by different routines.
  - Built personas and scenarios for friends, lovers and families with diverse daily schedules or in different time zones.

**User Research, Designed a VR auction platform**, Zhejiang University **10/16-12/16**

*Alibaba UED (User Experience Design Team) Workshop*

- Conducted market research and determined to design a VR Auction Platform for lovers of anime, comics and games.
- Built persona, journey map and storyboard to validate the auction and sociality process on a virtual scene.
- Made prototypes of the auction scenes by Rhinoceros and Keyshot and designed gestures to specify the interaction.

**Interface Design & User Research, Designed to stop sedentary lifestyle**, Zhejiang University **06/16-07/16**

*Philips Industry-University Collaboration Program with Eindhoven University of Technology and Zhejiang University*

- Designed a desktop application providing a new work ethic that allows for small exercises and breaks during work time.
- Conducted user research through interviews along with online data collection, and decided to alleviate current-, meanwhile prevent future complications that result from improper posture at the office due to sedentary lifestyle for office workers.
- Prototyped the application with Photoshop and built journey map for it.

## **ACTIVITIES & SOCIETIES**

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**Leader, Quality Development Center**, Zhejiang University **09/15-06/16**

**Key Member, Debate Team**, College of Computer Science, Zhejiang University **09/14-06/16**

**Key Member, Public Relationship Department**, Student Union, Zhejiang University **09/14-06/15**

## **HONORS**

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Outstanding Undergraduate, Outstand Undergraduate Dissertation, First-Class Scholarship, Outstanding Student Leader