HANFEI REN

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EDUCATION

University of California, Berkeley, M.Eng. in Electrical Engineering and Computer Science **Expected 05/19**

Zhejiang University, B.Eng. in Digital Media Technology & B.Eng. in Industrial Design, *GPA:3.88* **09/14-06/18**

National University of Singapore, Exchange Student in Computer Science, *GPA:4.00* **01/17-05/17**

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, <u>Hanfei Ren</u>, *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 Caffee 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 Oculous 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 Andriod 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

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 anmie, 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

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

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