ZIHAN YAN

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EDUCATION

Zhejiang University	*B.S.* Industrial Design	Computer Science College	GPA 92/100	Sept. 2018 – Jun. 2022
National University of Singapore		Undergraduate Researcher		Apr. 2020 – Sep. 2020
Cornell University		Undergraduate Researcher		Oct. 2020 – Apr. 2021

SELECTED PUBLICATIONS

［1］***Yan z h****, Shan y f, Yin k l, Li y y, Li x d, et al.* **Gender Differences of Cognitive Loads in Augmented Reality-based Warehouse.** (Conference Paper A, IEEE VR 2021, accepted)

［2］*Zhang r d, Chen m y, Benjamin S, Li y x,* ***Yan z h****, Chen y z, Tao s y, Chen t c, Hyunchul L, Zhang c, et al.* **SpeeChin: A Smart Necklace for Silent SpeechRecognition.** (MobiSys 2021, submitted)

［3］***Yan z h****, Wu y, Shan y f, Chen w q, Li x d, et al.* **ARGaze: A Dataset of Eye GazAWARSe Images for Calibration-Free Eye Tracking with Augmented Reality Headset.** (Journal of Nature-Scientific Data, submitted)

［4］***Yan z h,*** *Wu y f, Li y y, Shan y f, p Hansen, Li x d, et al.* **Reducing Cognitive Loads in Parcel Scanning with Eye Tracking-based Augmented Reality Headset.** (Interacting with Computers, submitted)

［5］*Zhang sh,* ***Yan z h*** *(co-first author), Shardul s, Zhao sh d, w-t Ooi,Ye q y, et al.* **Towards Moment-to-Moment Attention-aware Interfaces by Detecting Subsecond-scale Attention Fluctuations through EEG.** (Sensors MDPI, will submit)

［6］*Li x d, Wu y, Shan y f,* ***Yan z h****, Chen w q, Yang q y, et al.* **In the Making of Eye Tracking-enabled Augmented Reality Headset.** (Multimedia Tools and Applications, submitted)

［7］*Li x d, Chen w q, Shan y f, Wu y,* ***Yan z h****, et al.* **Enabling Asynchronous Collaboration of Exhibit Browsing in Augmented Reality Museum.** (IEEE Access, submitted)

RESEARCH EXPERIENCES

Moment-to-moment Attention-aware Interfaces.
NUS-HCI Lab, School of Computing, National University of Singapore Apr. -Sept. 2020
Supervised by: Associate Prof. Shengdong Zhao, Prof. Wei-Tsang Ooi

- Developed the first EEG-based sub-second scale moment-to-moment attention fluctuation detection method that achieves 73.4% accuracy, by introducing gradCPT as a ground truth measuring mechanism.
- Validated our method in video learning scenario and showed it can reasonably predict users' mind-wandering while watching lecture videos.
- Explored contribution opportunities of attention-aware systems/interfaces with sub-second scale granularity.

Deep Learning Images Captured from a Minimally Obstrusive Necklace.
Future Interactions (SciFi) Lab, Computing and Information Science, Cornell University Sept. 2020-Present
Supervised by: Assistant Prof. Cheng Zhang

- Designed a minimally-obtrusive necklace that can recognize 54 English and 44 Chinese silent speech commands for Silent speech recognition (SSR) technology.
- Mounted an infra-red(IR) camera in the necklace to capture images of facial movements from below the chin.
- Develop a model that consists of a CNN backbone followed by a LSTM block to capture both spatial and temporal features.
- Evaluated SpeeChin with 90.6% and 92.1% accuracy in English and 44 Chinese interactive command phrases.

Calibration-Free Eye Tracking with AR Headset.
CDC Lab, College of Computer Science and Technology, Zhejiang University Apr. 2020-Present
Supervised by: Associate Prof. Xiangdong Li

- Presented ARGaze Dataset for calibration-free eye tracking with AR headset.
- Comprised 1,321,968 pairs of eye images and corresponding world view in 50 videos.
- Designed the SIFTNet- and ALSTM-FCN-hybrid model and implemented the model of InvisibleEye to validate the dataset.

- Accomplished record low eye gaze estimation error with over 50 training features.
- Described the guidance for dataset reuse and related implications for eye tracking design and evaluation.

Cognitive Loads Reduction in Parcel Scanning VR Headset.
CDC Lab, College of Computer Science and Technology, Zhejiang University Jul.-Sept. 2020
Supervised by: Associate Prof. Xiangdong Li

- Developed the eye tracking-based augmented reality headset with foveated vision detection and smooth pursuit to leverage parallel parcel barcode seeking-scanning and eye-gaze based scan result confirming.
- Conducted empirical study to collected both qualitative and quantitative data from 33 participants, including video footages of the study, eye gazes, EEG data, questionnaires, and interview feedbacks.
- Revealed for the first time that VR headset can eliminate cognitive loads via rigorous statistical analysis.
- Compared the headset's influence on workers' cognition loads and usability to traditional parcel scanning technology(PDA) in the controlled laboratory by nonparametric statistical hypothesis tests.

Gender Differences of Cognitive Loads.
CDC Lab, College of Computer Science and Technology, Zhejiang University Jul.-Oct. 2020
Supervised by: Associate Prof. Xiangdong Li

- Developed augmented reality headset to help the participants facilitate parcel sorting tasks and conducted empirical studies to investigate the gender differences of cognitive loads.
- Investigated various implications of the gender differences of cognitive loads in terms of operational efficiency, visual attention, working memories in different contexts between the male and the female.

PATENTS

- A Tibetan Dancing Shoes with Projection Function. (CN110710755A) Jan. 2020
- An AR Eyeglasses Design Method and Device Based on Non-calibrated Eye Movement Test with Warehouse-oriented Order Picking Tasks. (Pending) Dec.2020
- Cognitive Load and Fatigue Detection Method and Device in Order Picking Tasks. (Pending) Dec.2020

AWARDS

- iF Design Talent Award 2020 （Bamboo Shoot -A Soil Remediation Product Used Industrial Wastes） Nov.2020

SKILLS

- Programming language (Python, Java, C#, C++, HTML, CSS, JavaScript, SQL)
- Machine Learning (PyTorch, sklearn)
- Design (IXD, UX, PS, AI, Rhino, Keyshot)