EMILY KUANG

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https://emilykuang.github.io/

RESEARCH AREAS

Human-Computer Interaction; Human-AI Collaboration; AI and VR for User Experience; Visual Analytics; Aging and Accessibility

EDUCATION

PhD in Computing and Information Sciences Aug 2020 - present

Rochester Institute of Technology, New York State, United States

Advised by Dr. Kristen Shinohara and Dr. Mingming Fan

BASc in Biomedical Engineering Sept 2015 - Apr 2020

University of Waterloo, Ontario, Canada

Capstone advised by Dr. John Zelek

Graduated on Dean's Honour List

RESEARCH EXPERIENCE

Rochester Institute of Technology Aug 2020 - present

Graduate Research Assistant

Conducting research in the Center for Accessibility and Inclusion Research. Summary of projects:

- **Exploring Use of VR in UX Analysis**
  - Planning interviews with UX practitioners to understand unique challenges of assessing UX in VR products
  - Designing 3D AI-powered avatar to facilitate UX analysis in virtual environments

- **Designing Collaborative AI-Powered Visual Analytics Tool for UX Analysis**
  - Developed a visual analytics tool for collaborative analysis of usability test sessions
  - Conducted an exploratory study with paired participants to demonstrate its effectiveness in facilitating both problem identification and collaborative teamwork

- **Understanding Current UX Analysis Practices and Challenges**
  - Designed and conducted an international survey with 279 UX practitioners
  - Analyzed both quantitative and qualitative data to draw design recommendations

- **Including Accessibility in Computing Education**
    - National Science Foundation (NSF) funded project that aims to increase student awareness and learning of accessibility topics and skills
    - Investigating student performance and instructor feedback for computer science assignments that include accessibility concepts

- **Designing an Enhanced Gesture Typing Method for Older Adults**
    - Mentored a MS student to develop a new gesture typing method on T9 keyboards
    - Designed and conducted comparative user studies to determine effectiveness

Uncharted Software Inc., ASKE-E Team May 2021 - Aug 2021
Research Intern

- Worked on the DARPA Automating Scientific Knowledge Extraction (ASKE) program
- Designed wireframes and implemented new features in the human-machine interface (HMI) of a visual analytics system for multi-scale graph analysis and knowledge discovery

Huawei Technologies Canada, Human-Machine Interaction (HMI) Lab Jan 2019 - Aug 2020
Research Engineer

- Trained machine learning models for gesture recognition using Tensorflow
- Designed and conducted user experiments to explore novel interaction techniques on large screens using mid-air gesture input
- Developed Android app and Python demos for the Huawei Developer Conference 2019

University of Waterloo, Vision and Image Processing (VIP) Lab May 2016 - Apr 2018
Undergraduate Research Assistant

- Designed and 3D-printed a lens-free microscope and a smartphone spectrometer
- Conducted testing with biological specimens to achieve optical resolution in nanometer range, presented this work at the Conference on Vision and Intelligent Systems (CVIS 2016)

PEER-REVIEWED JOURNAL PUBLICATIONS

[3] Ehsan Jahangirzadeh Soure*, **Emily Kuang***, Mingming Fan, and Jian Zhao. CoUX: Collaborative Visual Analysis of Think-Aloud Usability Test Videos for Digital Interfaces. *IEEE Transactions on Visualizations and Computer Graphics (TVCG), (Proc. of IEEE VIS)*, 2021. DOI: 10.1109/TVCG.2021.3114822 (* denotes equal contribution)

[2] **Emily Kuang**, Farnoud Kazemzadeh, Alexander Wong. Enhanced Smartphone Spectroscopy via High-throughput Computational Slit. *Journal of Computational Vision and Imaging Systems*, vol. 2, no. 1, 2016. DOI: 10.15353/vsnl.v2i1.97

[1] Farnoud Kazemzadeh, **Emily Kuang**, Alexander Wong. Compact, Field-Portable Lens-free Microscope using Superresolution Spatio-Spectral Light-field Fusion. *Journal of Computational Vision and Imaging Systems*, vol. 2, no. 1, 2016. DOI: 10.15353/vsnl.v2i1.105

PEER-REVIEWED CONFERENCE PUBLICATIONS

[2] Xiaofu Jin, **Emily Kuang**, Mingming Fan. "Too old to bank digitally?": A Survey of Banking Practices and Challenges Among Older Adults in China. *Proc. ACM Conference on Designing Interactive Systems (DIS)*, 2021. DOI: 10.1145/3461778.3462127

[1] Ameneh Boroomand, Mohammad Javad Sahfiee, Linda Wang, **Emily Kuang**, Farnoud Kazemzadeh, Alexander Wong. Compensated lens-free light field spectroscopy. *Proc. International Conference on Inverse Problems in Engineering (ICIPE)*, 2017.

PEER-REVIEWED WORKSHOP PUBLICATIONS

[1] Fahd Husain, Rosa Romero-Gómez, **Emily Kuang**, Dario Segura, Adamo Carolli, Lai Chung Liu, Manfred Cheung, Yohann Paris. A Multi-scale Visual Analytics Approach for Exploring Biomedical Knowledge. *Proc. Workshop on Visual Analytics in Healthcare (VAHC), IEEE VisWeek*, 2021. arXiv:2109.06828 **[🏆Best Paper Winner]**

AWARDS AND HONORS

Merit-based Ph.D. Scholarship ~ Rochester Institute of Technology 2020

Co-op Student of the Year ~ Nomination for University of Waterloo's Award 2019

Experience Award ~ Natural Sciences and Engineering Research Council of Canada (NSERC) 2018

President's Research Award ~ University of Waterloo 2018

President's Research Award ~ University of Waterloo 2017

Undergraduate Student Research Award ~ NSERC 2016

President's Scholarship of Distinction ~ University of Waterloo 2015

INDUSTRY EXPERIENCE

North Inc. (now acquired by Google) Apr 2018 - Aug 2018

Computer Vision Developer

- Designed algorithm to quantify image sharpness and created a GUI to output real-time metrics; reduced time needed for assembling multi-camera system used to fit smart glasses
- Conducted field studies with beta testers during the sizing procedure; led to process improvements

Synaptive Medical Inc. Sept 2017- Dec 2017

Optics Engineering Intern

- Designed and led an investigation into the stabilization of stereoscopic videos for a neurosurgical robot; results led to reduced complexity of the FPGA architecture
- Collected feedback from surgeons to optimize visualization presets during mock surgeries

St. Michael's Hospital Jan 2017 - Apr 2017

Medical Imaging Research Assistant

- Created a video processing pipeline for non-invasive detection of diabetic foot ulcers
- Assisted with patient interviews to determine user requirements for the in-home prototype

PROFESSIONAL SERVICE

Reviewer

- Late Breaking Work at **Chinese CHI** 2021
- Full Papers at **ACM CHI** 2022

Student Volunteer

- IEEE Visualization Conference (**VIS**) 2021

INVITED TALKS

Collaborative Visual Analysis of Think-Aloud Usability Test Videos for Digital Interfaces

- Guest Lecture in ISTE782: Visual Analytics, Nov 2021

SKILLS

Programming: Python • C/C++ • Java • MATLAB • JavaScript • HTML/CSS

Platforms & Toolkits: Tensorflow • OpenCV • Pandas • Scikit-learn • Matplotlib • D3.js • Tableau

Design: Visualization design • Interface Design • Interaction Design • Figma • Balsamiq

Qualitative Research: User-Centered Design • Interview • Focus Group • Survey • Thematic Analysis

Quantitative Research: Usability Testing • Experiment Design • Statistical Analysis • R • JMP