KEFAN XU

Ph.D. Student, Information Science (HCC), Georgia Tech
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EDUCATION

2022 – Present
Georgia Institute of Technology
Ph.D. Student, Information Science, 4.0/4.0
Advisor: Dr. Rosa I. Arriaga
Atlanta, GA, U.S.

2019 – 2021
University of Michigan
M.S., Information Science, 4.0/4.0
Advisor: Dr. Mark W. Newman
Ann Arbor, MI, U.S.

2015 – 2019
New York University
B.S. Data Science | B.S. Interactive Media Arts (Doubled), 3.59/4.0
New York City, NY, U.S.
Shanghai, China

PUBLICATIONS

Xu, K., Yan, X. and Newman, M.W. 2022. Understanding People's Experience for Physical Activity Planning and Exploring the Impact of Historical Records on Plan Creation and Execution. CHI Conference on Human Factors in Computing Systems (New Orleans LA USA, Apr. 2022), 1-15.

[In Submission] **Xu, K.,** Yan, X., Newman, M.W., and Arriaga, R.I. 2023. Rethinking Self-Experimentation: Understanding the Effect of Reflective Iteration on Individuals' Physical Activity Planning

AWARDS

2022 **Google Health Equity Research Initiative** | Google

2021 **IHPI/HSR Summer Student Fellowship** | University of Michigan

2019 **NYU Founders Day Award** | New York University

2016 **Tel Aviv University Summer Scholar Program** | Tel Aviv University

RESEARCH EXPERIENCE

2022 – Present
Graduate Research Assistant | School of Interactive Computing, Georgia Tech
Atlanta, GA, U.S.

Researcher in the **Ubicomp Health and Wellness lab**, investigating supporting **low-SES population** with **diabetes foot ulcers (DFU)**, as part of an **ADA** Grant.

Graduate Research Assistant | School of Information, University of Michigan

2019 – 2022 — Ann Arbor, MI, U.S.

Student researcher, developed low-burden **experience sampling method (ESM)** for **older adults** with chronic fatigue.

Research Intern | Michigan Medicine, University of Michigan

2021 – 2022 — Ann Arbor, MI, U.S.

Student research intern, developed web platform, **Taperology**, to facilitate clinicians' taper therapy for **benzodiazepine misuses**.

Research Intern | College of Design and Innovation, TongJi University

2018 — Shanghai, China

Student research intern in the **iDVX lab**, developed and evaluated a **facial expression dataset** for designers to create personas.

RESEARCH PROJECTS

Diabetes Ubiquitous Computational Sensing System (DUCSS)

2022 – Present

Collaboration with Emory University and Grady Memorial Hospital

Theoretical Contribution: Investigating applying the **Ecological System Theory** to understand the care ecology of multiple stakeholders in diabetes foot ulcer care. **User Study Design**: Designing user studies to uncover diabetes patients' self-management challenges, utilizing a user-centric approach. **Caregiver-Patient Dynamics**: Exploring caregiving dynamics in diabetes management, illuminating collaborative aspects. **Self-Management Systems:** Innovating prototypes enhancing diabetes patients' self-management practices and patient-clinician communication.

Understanding the Effect of Iterative Reflection on Individuals' Weekly Planning of Physical Activity

2021 – 2023

Collaboration with University of Michigan

[In Submission]

Theoretical Contribution: Rethought the **self-experimentation** framework and proposed a iterative reflection approach to assist individual's' practice of identifying preferable physical activity routines. **Framework Implementation:** Integrated the conceptualized physical activity planning framework within the functional Planneregy app. **Usability Studies:** Carried out comprehensive usability studies to assess the app's user-friendliness and effectiveness. **42-Day User Study:** Orchestrated a 42-day user study, dedicated to assessing user experiences within the newly proposed framework. **HCI Paper and Design Insights:** Summarized the results of the 42-day study into an HCI paper, offering valuable design insights for prospective research endeavors.

FITBIT as Tech Probe: Understanding how Personal Tracking Devices can Promote Physical Activity in Low-SES Older Adults

2022 – Present

Funded by Google Health Equity Initiative

Barrier Analysis: Examined the obstacles faced by **low technology literacy** individuals when engaging with technology. **Design Evaluation:** Evaluated design methodologies intended for low technology literacy users, pinpointing their strengths and limitations. **Refined Design Approach:** Developing a methodology for crafting technology solutions that are intuitive and accessible to individuals with limited technology literacy. **Prototyping and Evaluation:** Designing and deploying functional technology prototypes to empirically evaluate the proposed design principles, ensuring their effectiveness for low technology literacy populations.

Prolonged Exposure Collective Sensing System (PECSS)

2022 – Present

Collaboration with Emory University

Patient Insight: Delved into PTSD patients' practices, uncovering their treatment experiences. **Clinical Workflow Analysis:** Studied step-by-step clinical procedures of **Prolonged Exposure therapy**, grasping the treatment process. **Clinician-Facing Tool Development:** Designed, evaluated, and implemented tools for clinicians, optimizing patient management and treatment strategies. **Patient-Facing Tool Creation**: Creating, assessing, and deploying patient tools, aiding Prolonged Exposure therapy and clinician communication.

Understanding Individual's Sense Making in Contextual Situated Sedentary Behavior Data

2022 – Present

Collaboration with University of Michigan

Theoretical Contribution: Investigating the concept of **Situated Objectivity** in interpreting individuals' sense making of their physical activity tracking data. **ESM Refinement:** Refining existing Experience Sampling Methods to encompass richer annotated data, enabling a more accurate depiction of individuals' physical activity habits. **System Development:** Conceptualizing and deploying a system that seamlessly amalgamates physical activity data, empowering individuals to gain comprehensive insights into their activity levels.

Understanding the Dynamics of Chronic Disease Family Caregiving Experience: Using Caregiving Reddits as a Probe

2022 – Present

Subreddit Exploration: Conducted analysis of posts originating from caregiving subreddits, unraveling the multifaceted nature of enduring **informal caregiving** encounters. **Initial Post Compilation**: The meticulous compilation of **120** foundational posts was achieved by tapping into four distinct caregiving forums and their accompanying comments. **Author-Driven Continuity:** Pursued an author-centric approach, further harvesting relevant posts spanning their caregiving journey, sequenced in chronological order. **Qualitative and Quantitative Insight**: My research delves into both qualitative and quantitative realms, parsing these posts to elucidate the fluid dynamics characterizing caregiving experiences.

Examining the Effect of Summary of Historical Planning Data on People's Planning and Execution of Subsequent Daily Physical Activity

2021 – 2022

Accepted by CHI2022

Leveraging the theory of **Implementation Intention** to understand people's experiences of planning regular moderate aerobic exercises with historical planning records. **App Development:** Developed an iOS application named Physicify, empowering users to strategize physical exercise plans and reflect on prior planning histories. **Two-Stage User Study Design:** Designed a two-phase user study, assessing participants' exercise planning encounters with and without historical data. **28-Day User Study Implementation:** Conducted a 28-day user study with seventeen participants, aiming to glean qualitative insights into Physicify's utilization. **Findings and Insights:** Findings suggested historical planning records could effectively shape future exercise plans by establishing connections between past failures and identifying uncertainty levels in forthcoming schedules.

Leveraging large-scale national data to understand, reduce, and prevent benzodiazepine-related harms among older adults

2021 – 2022

Facilitate clinicians' **taper therapy** for **benzodiazepine misuses**. **Website Design and Deployment:** Designed and deployed a clinician-facing website, aiming to enhance communication regarding benzodiazepine misuse between clinicians and patients. **Tracking Mechanisms Development:** Crafted tracking mechanisms that enabled clinicians to closely monitor patients' progress during the tapering process. **Interview-Based Assessment:** Conducted interviews with clinicians, soliciting their insights and experiences, in order to gauge the efficacy of the website in routine care.

Low-burden Activity Pacing for Chronic Fatigue Self-Management

2019 – 2022

ESM Refinement: Developed seven **experience sampling methods** (Proactive, Signal-Based, Event-Based, Post-Activity, Time-Based, Context-Based, CAR) inspired by self-tracking literature. Designed low-burden hybrid Experience Sampling Methods (ESM) solutions for limited energy individuals. **Cardiac Rehab Exploration:** Investigated activity practices of cardiac rehab patients, informed mobile app development incorporating activity pacing. **Chronic Condition Management:** Devised recurrent tracking-reflection mechanism aiding daily energy management for chronic conditions. **Prototypes Development**: Crafted mobile app prototypes aligned with the recurrent mechanism concept.

Intelligent Design of Emotional Expression Sketches in Storyboards

2018

Facial Sketch Dataset Design: Created FaceX dataset, containing five million **vector-drawing sketches**, for generating emotional expression for designers. **User Study & Evaluation:** Recruited 21 participants for a user study on EmoG's use in emotional storyboard creation. **Effectiveness Assessment:** Evaluated EmoG's efficiency in accurately conveying emotions in storyboards. Quantitative analysis via ANOVA tests. **Ease of Use and Effectiveness:** Demonstrated EmoG's user-friendliness and efficacy in creating expressive drawings.

REVIEWER

2022 **IEEEICHI2022**

2022 **CHI 2022 Late-Breaking Work**

MENTORING EXPERIENCE

2022 – 2023 **Diptark Bose** | Master Student | Now Software Development Engineer at Apple

Supervised Diptark in developing the PECSS platform for PTSD patients.

2022 – 2023 **Hao Yuan** | Master Student | Now PhD Student at the Drexel University

Supervised Hao in conducting user recruitment and users studies with diabetes foot ulcer patients.

2022 – 2023 **Abhinav Thukral** | Master Student | Now UX Designer

Supervised Abhinav in developing DUCSS platform for clinicians and patients to monitor diabetes foot ulcers.

2022 – Present **Cynthia Baseman** | Master Student

Supervising Cynthia in developing study protocols to understand the experience of DFU patients and their caregivers.

2023 – Present **Austin Rubinger** | Undergraduate Student

Supervising Austin in collecting and analyzing Reddit content posted by informal caregivers.

2023 – Present **Nikita George** | Undergraduate Student

Supervising Nikita in collecting and analyzing Reddit content posted by informal caregivers.

TALK

2023 **CRIDC Poster Competition 2023**