Gyuwon **Jung**

POSTDOCTORAL RESEARCHER, ETRI

Electronics and Telecommunications Research Institute (ETRI)
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Summary

As a researcher in the **Human-Computer Interaction (HCI)** field, my work primarily focuses on enhancing human understanding of data through advanced data analysis techniques related to "**What-If Analysis**," such as **Causal Inference** and **Counterfactual Explanations**. I am particularly interested in exploring approaches that provide practical and explainable insights based on **everyday-life data** across various domains, including health and behavior change. With my research experience in **Human-Data Interaction**, I have strived to empower users to make more rigorous and effective data-driven decisions. As a result of these efforts, I have published papers in top-tier HCI conferences, including ACM CHI, UbiComp (IMWUT), and CSCW.

My research interests can be summarized with the following keywords:

Mobile Data, Observational Study, Causal Inference, Counterfactual Explanations, Personal Informatics, Behavior Change, Digital Health, Digital Therapeutics, User Engagement, and Quantitative and Qualitative User Study

Education

Ph.D. in Computer Science
Daejeon, Republic of Korea

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)
Mar. 2020 - Feb. 2025

- Advisor: Dr. Uichin Lee
- Dissertation Committee: Dr. Eun Kyoung Choe, Dr. Juho Kim, Dr. Hwajung Hong, Dr. Joseph Seering
- Dissertation: Causal Inference and Counterfactual Explanations for Personal Informatics

M.S. in Knowledge Service Engineering
Daejeon, Republic of Korea

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)
Mar. 2016 - Feb. 2018

- Advisor: Dr. Uichin Lee
- Thesis: Mobile Situated Massive Open Online Intervention (MS-MOOI): A Case Study of Parenting Smartphone Usage

B.S. in Chemistry (*Cum Laude*)
Daejeon, Republic of Korea

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)
Feb. 2009 - Feb. 2016

- Double major: Business and Technology Management

Experience

Postdoctoral Researcher
Daejeon, Republic of Korea

DIGITAL CONVERGENCE RESEARCH LABORATORY, ETRI
Mar. 2025 - Current

- **Researcher** of the Human Enhancement & Assistive Technology Research Section, analyzing human behavior from lifelogging mobile data with a focus on causal inference in emotion and sleep-related scenarios

Research Assistant
Daejeon, Republic of Korea

INTERACTIVE COMPUTING LAB., KAIST
Mar. 2020 - Feb. 2025

- **Lead Research Assistant** on the project titled "Development of Fundamental Technologies of Data-Driven Digital Therapeutic Delivery Receptivity Optimization for Mobile Digital Therapeutic Development" (National Research Foundation of Korea (NRF))
- **Co-lead Research Assistant** on the project titled "Development of Remote Platform Technologies to Prevent and Manage Emotional Disorders in the Post-pandemic Era" (National Research Foundation of Korea (NRF))
- **Research Assistant** on the project titled "Development of Cognitive-Behavioral Routine Computing Platforms for Everyday Mental Health Monitoring and Empirical Research on Depressive Symptoms of Young Adults" (National Research Foundation of Korea (NRF))

Associate Product Manager
Seoul, Republic of Korea

DRONE PLATFORM DEVELOPMENT TEAM, LG UPLUS CORP.
Jan. 2018 - Sep. 2019

- **Manager** of the development of a remote UAV (Unmanned Aerial Vehicle) control system utilizing 4G/5G networks
- **Lead Manager** of the development of a high-precision positioning system (GPS/RTK, centimeter-level accuracy for UAVs)

Winter Intern

KB Kookmin Bank

- **Internship** at Dun-san Clover Branch (Daejeon) of Korea's top commercial bank; customer service and new product development

Publications

Conference and Journal Papers (★ = major papers)

[C.12] ★ **Gyuwon Jung**, Heejeong Lim, Kyungsik Han, Hyungsook Kim, Uichin Lee. (2025). "Designing a Visual Analytics Tool to Support Data Analysis Tasks of Digital Mental Health Interventions: A Case Study." *JMIR Human Factors (forthcoming/in press)* doi:10.2196/64967

[C.11] Kwangyoung Lee, Yeohyun Jung, **Gyuwon Jung**, Xi Lu, Hwajung Hong. (2025). "Peerspective: A Study on Reciprocal Tracking for Self-awareness and Relational Insight." *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)* doi:10.1145/3706598.3713404 (**BK21+ IF: 4**, acceptance rate: 24.9%)

[C.10] ★ **Gyuwon Jung**, Uichin Lee. (2025). "CounterStress: Enhancing Stress Coping Planning through Counterfactual Explanations in Personal Informatics." *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)* doi:10.1145/3706598.3713730

[C.09] Panyu Zhang, **Gyuwon Jung**, Jumabek Alikhanov, Uzair Ahmed, Uichin Lee. (2024). "A Reproducible Stress Prediction Pipeline with Mobile Sensor Data." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)* 8, 3 doi:10.1145/3678578

[C.08] ★ **Gyuwon Jung**, Sangjun Park, Uichin Lee. (2024). "DeepStress: Supporting Stressful Context Sensemaking in Personal Informatics Systems Using a Quasi-experimental Approach." *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)* doi:10.1145/3613904.3642766 (**BK21+ IF: 4**, acceptance rate: 26.4%)

[C.07] ★ **Gyuwon Jung**, Sangjun Park, Eun-Yeol Ma, Heeyoung Kim, Uichin Lee. (2024). "Tutorial on Matching-based Causal Analysis of Human Behaviors Using Smartphone Sensor Data." *ACM Computing Surveys* 56, 9 doi:10.1145/3648356 (**IF: 23.8** (in 2023, ranked 1/143 in Computer Science Theory & Methods))

[C.06] Yugyeong Jung, **Gyuwon Jung**, Sooyeon Jeong, Chaewon Kim, Woontack Woo, Hwajung Hong, Uichin Lee. (2023). ""Enjoy, but Moderately!": Designing a Social Companion Robot for Social Engagement and Behavior Moderation in Solitary Drinking Context." *Proceedings of the ACM on Human-Computer Interaction (CSCW)* 7, CSCW2 doi:10.1145/3610028

[C.05] Uichin Lee, **Gyuwon Jung**, Eun-Yeol Ma, Jin San Kim, Heepyung Kim, Jumabek Alikhanov, Youngtae Noh, Heeyoung Kim. (2023). "Toward Data-Driven Digital Therapeutics Analytics: Literature Review and Research Directions." *IEEE/CAA Journal of Automatica Sinica* 10, 1 doi:10.1109/JAS.2023.123015 (**IF: 15.3** (in 2023, ranked 1/84 in Automation & Control Systems))

[C.04] Inyeop Kim, Minsam Ko, Joonyoung Park, Sung Wook Moon, **Gyuwon Jung**, Youn-kyung Lim, Uichin Lee. (2022). "Social-Spiritual Face: Designing Social Reading Support for Spiritual Well-being." *Proceedings of the ACM on Human-Computer Interaction (CSCW)* 6, CSCW2 doi:10.1145/3555162

[C.03] ★ **Gyuwon Jung**, Jio Oh, Youjin Jung, Juho Sun, Ha-Kyung Kong, Uichin Lee. (2021). ""Good Enough!": Flexible Goal Achievement with Margin-based Outcome Evaluation." *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21)* doi:10.1145/3411764.3445608 (**BK21+ IF: 4**, acceptance rate: 26.3%)

[C.02] **Gyuwon Jung**, Hyunsoo Lee, Auk Kim, Uichin Lee. (2020). "Too Much Information: Assessing Privacy Risks of Contact Trace Data Disclosure on People With COVID-19 in South Korea." *Frontiers in Public Health* 8 doi:10.3389/fpubh.2020.00305

[C.01] Inyeop Kim, **Gyuwon Jung**, Hayoung Jung, Minsam Ko, Uichin Lee. (2017). "Let's FOCUS: Mitigating Mobile Phone Use in College Classrooms." *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)* 1, 3 doi:10.1145/3130928

Posters, Demos, and Workshop Papers

[P.11] Panyu Zhang, **Gyuwon Jung**, Uzair Ahmed, Uichin Lee. (2025). "CausalCFF: Causal Analysis between User Stress Level and Contextually Filtered Features Extracted from Mobile Sensor Data." *Extended Abstracts of the 2025 CHI Conference on Human Factors in Computing Systems (CHI EA '25)* doi:10.1145/3706599.3719776

[P.10] **Gyuwon Jung**, Uichin Lee. (2024). "Counterfactual Explanations in Personal Informatics for Personalized Mental Health Management." *Companion of the 2024 on ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp '24)* doi:10.1145/3675094.3678427

[P.09] Uichin Lee, **Gyuwon Jung**, Sangjun Park, Eun-Yeol Ma, Heeyoung Kim, Yonggeon Lee, Youngtae Noh. (2023). "Data-driven Digital Therapeutics Analytics." *2023 IEEE International Conference on Big Data and Smart Computing (BigComp)* doi:10.1109/BigComp57234.2023.00093

[P.08] **Gyuwon Jung**, Sangjun Park, Uichin Lee, Eun-Yeol Ma, Heeyoung Kim. (2023). "Causal Analytic Process for Mobile Health Data." *2023 IEEE International Conference on Big Data and Smart Computing (BigComp)* doi:10.1109/BigComp57234.2023.00088

[P.07] **Gyuwon Jung**, Youwon Shin, Jieun Lim, Uichin Lee. (2022). "CareMouse: An Interactive Mouse System that Supports Wrist Stretching Exercises in the Workplace." *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems (CHI EA '22)* doi:10.1145/3491101.3519857

[P.06] Yongshin Kim, Panyu Zhang, **Gyuwon Jung**, Heepyung Kim, Uichin Lee. (2021). "Causal Analysis of Observational Mobile Sensor Data: A Comparative Study." *Korean Institute of Information Scientists and Engineers, 2021*

[P.05] Chaewon Kim, Yugyeong Jung, **Gyuwon Jung**, Woontack Woo, Uichin Lee. (2021). "Cheersbot: Drinking Companion Robot That Provides Physical/Auditory Interaction to Improve Loneliness." *Journal of the HCI Society of Korea, 2021*

[P.04] Juho Sun, Sangkeun Park, **Gyuwon Jung**, Yong Jeong, Uichin Lee, Kyong-Mee Chung, Changseok Lee, Heewon Kim, Suhyon Ahn, Ahsan Khandoker, Leontios Hadjileontiadis. (2020). "BeActive: Encouraging Physical Activities with Just-in-time Health Intervention and Micro Financial Incentives." *Proceedings of the 2020 Symposium on Emerging Research from Asia and on Asian Contexts and Cultures (AsianCHI '20)* doi:10.1145/3391203.3391206

[P.03] **Gyuwon Jung**, Andrzej Zarzycki, Ji-Hyun Lee. (2017). "Mom's Tray: Real-Time Dietary Monitoring System." *SIGGRAPH Asia 2017 Mobile Graphics & Interactive Applications (SA '17)* doi:10.1145/3132787.3139196

[P.02] Inyeop Kim, **Gyuwon Jung**, Hayoung Jung, Minsam Ko, Uichin Lee. (2017). "Let's FOCUS: Location-Based Intervention Tool to Mitigate Phone Use in College Classrooms." *Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2017 ACM International Symposium on Wearable Computers (UbiComp '17)* doi:10.1145/3123024.3123165

[P.01] **Gyuwon Jung**, Inyeop Kim, Hayoung Jung, Uichin Lee. (2017). "Understanding Smartphone Usage during the University Class And Exploring Design Factors of Intervention System to Promote Concentration in Class." *Journal of the HCI Society of Korea, 2017*

Patents

[T.05] Uichin Lee, **Gyuwon Jung**, Heepyung Kim, Sangjun Park. (2023). "SYSTEM AND METHOD FOR AUTOMATING SELF-EXPERIMENTATION BASED ON LIFELOG DATA FOR HEALTH BEHAVIOR CHANGE." (KR) Application No. 10-2022-0148907, (US) Application No. 18/190,784

[T.04] Uichin Lee, **Gyuwon Jung**, Eun-Yeol Ma, Heeyoung Kim. (2022). "ANALYSIS SYSTEM AND METHOD FOR CAUSAL INFERENCE OF DIGITAL THERAPEUTICS BASED ON MOBILE DATA." (KR) Application No. 10-2022-0024541, (US) Application No. 17/844,648

[T.03] **Gyuwon Jung**, Dong-Wook Seo, Sangwook Park, Bo-Gyeong Seong. (2021). "UNMANNED AERIAL APPARATUS AND OPERATING METHOD THEREOF." (KR) Patent No. 10-230904

[T.02] **Gyuwon Jung**, Dong-Wook Seo. (2021). "CONTROL SERVER AND METHOD FOR SETTING FLIGHT PATH OF UNMANNED AERIAL VEHICLE USING THIS." (KR) Patent No. 10-2252920

[T.01] **Gyuwon Jung**, Jun-Yong Yoon, Junglae Lee. (2020). "CONTROL SERVER, METHOD FOR SETTING FLIGHT PATH OF UNMANNED AERIAL VEHICLE USING THIS, AND FLIGHT PATH GUIDE SYSTEM THEREFOR." (KR) Patent No. 10-2174205

Honors, Awards, and Grants

2024 KAIST Graduate Student Outstanding Paper Award

College of Engineering, KAIST

- President's award
- Paper: Tutorial on Matching-based Causal Analysis of Human Behaviors Using Smartphone Sensor Data (ACM CSUR, 2024)

Certificate of Appreciation

Korean Institute of Information Scientists and Engineers (KIISE)

- Presenting the latest research in the Top Conference Session at KCC 2024
- Paper: DeepStress: Supporting Stressful Context Sensemaking in Personal Informatics Systems Using a Quasi-experimental Approach (ACM CHI, 2024)

Certificate of Excellence, Education4.0 Q TA Report

HEAD OF CENTER FOR EXCELLENCE IN LEARNING & TEACHING, KAIST

- Outstanding work as a TA for Education4.0 Q Program at KAIST Spring 2022

NRF Ph.D. Fellowship

BASIC SCIENCE RESEARCH PROGRAM, NATIONAL RESEARCH FOUNDATION OF KOREA (NRF)

- Project: Development and Evaluation of Interactive Visual Analytic Technologies for Supporting Causal Inference with Lifelogging Data (Jun. 2022 - May. 2024)
- **Total**: 40M KRW (Approx. 29K USD)

Invited Talks

Unveiling Causal Relationships in Mobile Observational Data for Digital Health
DIGITAL THERAPEUTICS COURSE, CHUNGNAM NATIONAL UNIVERSITY

Daejeon, Republic of Korea
Nov. 2024

- Proposed a big picture combining mobile observational data, causal inference, counterfactual explanations, and digital therapeutics

Supporting Stressful Context Sensemaking in Personal Informatics Systems Using a Quasi-experimental Approach
THE FIRST WORKSHOP ON UBIQUITOUS AFFECTIVE COMPUTING AND HEALTH INFORMATICS (UACHI)

Daejeon, Republic of Korea
Oct. 2024

- Introduced a recent study on personal informatics supporting causal analysis for stress management

Exploring Causal Relationships in Digital Health Using Mobile Self-Tracking Data
URBAN INTERFACES LAB., THE UNIVERSITY OF SYDNEY

Sydney, Australia
Oct. 2024

- Introduced causal inference approaches for digital health based on individuals' mobile data

Teaching Experiences

Lead Teaching Assistant
SMART HEALTH - DATA-DRIVEN SERVICE DESIGN FOR HEALTH AND WELLBEING (CoE491)

KAIST
Fall 2022

- Co-developed lecture materials and in-class activities
- Mentored team projects

Teaching Assistant
INTRODUCTION TO HUMAN-COMPUTER INTERACTION (CS374)

KAIST
Spring 2022

- Co-developed lecture materials and in-class activities
- Mentored team projects
- Recognized as **the top TA in the Education 4.0 Q**

Teaching Assistant
ADVANCED HUMAN-COMPUTER INTERACTION (CS592)

KAIST
Spring 2021

- Evaluated course assignments

Teaching Assistant
MOBILE AND PERVASIVE COMPUTING FOR KNOWLEDGE SERVICE (KSE624)

KAIST
Spring 2020

- Co-developed lecture materials for utilizing JetBot (an open-source robot based on NVIDIA Jetson Nano)
- Mentored team projects
- Published a **domestic poster (2021)** and a **CSCW paper (2023)**

Academic Services

Local Co-Chair
THE 1ST WORKSHOP ON UBIQUITOUS AFFECTIVE COMPUTING AND HEALTH INFORMATICS (2024)

- Served as a local co-chair (poster session) for the Ubiquitous Affective Computing and Health Informatics (UACHI) workshop

Session Chair

The 1st Workshop on IoT Big Data for Health and Wellbeing (2023)

- Served as a session chair for the IoT Big Data for Health and Wellbeing workshop (IoTHealth 2023), part of the 2023 IEEE International Conference on Big Data and Smart Computing (BigComp 2023)

Student Steering Committee

HCI@KAIST (2021)

- Served as a committee member of HCI@KAIST, a research community at KAIST composed of prominent HCI researchers
- Organized HCI research workshops and hosted seminars by inviting external speakers

External Reviewer

Academic Peer Review

- ACM CHI 2022, 2023, 2025, 2025 LBW
- ACM IMWUT 2025

Leadership Experience

Lab Student Representative
Interactive Computing Lab., KAIST

Daejeon, Republic of Korea
Jan. 2023 - Dec. 2023

- Organized lab events
- Held weekly meetings with the advisor

Master Student Representative
Department of Knowledge Service Engineering, KAIST

Daejeon, Republic of Korea
Sep. 2017 - Aug. 2018

- Organized department events
- Held regular meetings with professors

Auxiliary Combat Police
Mobile Police Headquarters, Seoul Metropolitan Police Agency

Seoul, Republic of Korea
Sep. 2012 - Jun. 2014

- Military service in the Republic of Korea
- Crowd and event management in Seoul
- Squad leader, honorably discharged (21 months)