Kyunghwan Kim

PH.D. STUDENT @ SCHOOL OF COMPUTING, KAIST

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*" I connect **Humans** with **Computers** through novel **Input Devices** and **Physical Interaction** techniques!! "*

Education

Korea Advanced Institute of Science and Technology (KAIST)   *Mar. 2023 ~ Present*

Ph.D. in COMPUTER SCIENCE (SCHOOL OF COMPUTING)   *(Mar. 2025 ~ Present)*

M.S. in COMPUTER SCIENCE (SCHOOL OF COMPUTING)   *(Mar. 2023 ~ Feb. 2025)*

· M.S. Thesis: Virtual Rolling Temple (VRT): Expanding the Vertical Input Space of a Thin Smart Glasses Touchpad

Gwangju Institute of Science and Technology (GIST)   *Mar. 2017 ~ Feb. 2023*

B.S. in ELECTRICAL ENGINEERING AND COMPUTER SCIENCE

Minor in CULTURE TECHNOLOGY (CT), *Integrated Minor in* ECONOMICS *and* BUSINESS ADMINISTRATION

· B.S. Thesis: Analysis of the Effect of Vection Generated by Directional Optical Flow in the VR Redirected Walking Scenario
· 🏆 ***Best B.S. Thesis Award*** *(1st place)* | 🏆 Graduated ***Cum Laude*** (GPA 3.93/4.50)

University of California, Berkeley   *Summer 2018*

2018 Summer Session Program in COMPUTER SCIENCE (CS61C) *and* STATISTICS (STAT20)

Research Experiences

Human Computer Interaction (HCI) Lab, KAIST   *Mar. 2023 ~ Present*

M.S. STUDENT & PH.D. STUDENT | *Advisor: Prof. Geehyuk Lee*

· Identifying the transfer gap of motor skills from real-world interaction to AR/VR, focusing on how input sensing and system feedback are constrained by technical and environmental limitations.
· Designing and prototyping interaction schemes that preserve and leverage users' existing motor skills under AR/VR-specific limitations.
· Validating the schemes and hardware prototypes through iterative hardware prototyping and user studies, aiming to enable fast, low-effort skill transfer in AR/VR.

Human-Centered Intelligent Systems (HCIS) Lab, GIST   *May. 2021 ~ Dec. 2022*

UNDERGRADUATE INTERN | *Advisor: Prof. Seungjun Kim*

· Visited MIT for on-site joint development of the sensor, as part of a *GIST-MIT Joint Research Project* on explainable AI services for drivers.
· Developed a VR experiment environment for the research on augmented sense at Redirected Walking. *(Unity, Arduino, VIVE Pro Eye)*
· Developed a 3D depth-based in-car AR environment that synchronizes to the movement of the car. *(Unity, ZED Mini, Meta Quest 2)*

Human-Centered Computer Systems (HCS) Lab, Seoul National University (SNU)   *Winter 2022*

UNDERGRADUATE INTERN | *Advisor: Prof. Youngki Lee*

· Built *UnityEagleEye*, an XR pipeline that overlays AI perception outputs on 360° VR video in Unity. *(Unity, Meta Quest 2)*

Computer Vision Lab, GIST   *Summer 2017*

UNDERGRADUATE INTERN | *Advisor: Prof. Kin Choong Yow*

· Assisted research on the implementation of Free Viewpoint TV via OpenCV.

Awards & Honors

RESEARCH & ACADEMIC

2025 **MSIT Minister's Award (Top 5/206 Teams)**, Team Geppetto, ICT Challenge 2025, Ministry of Science and ICT (MSIT)   [LINK]
2024 **Outstanding TA of the Semester Award (Top 22/154 TAs)**, School of Computing, KAIST
2024 **Honorable Mention: Jury's Best Demo Recognition**, CHI '24 Interactivity, ACM SIGCHI
2022 **Best B.S. Thesis Award (1st place)**, School of Electrical Engineering and Computer Science, GIST

PROFESSIONAL & EXTRACURRICULAR

2025 **Commendation for Excellence in Science & Technology Reserve Forces Training**, ROK Army Consolidated Logistics School
2021 **Honorable Mention (Video Category)**, The 6th KOSMA Student Competition, Korean Society of Media and Arts (KOSMA)
2019 **Distinguished Trainee Award (8th/1,560 Recruits)**, ROK Air Force Basic Military Training Wing

Publications

[6] **Ball20: An In-Hand Near-Spherical 20-Sided Tangible Controller for Diverse Gesture Interaction in AR/VR**
Sunbum Kim, <u>Kyunghwan Kim</u>, Changsung Lim, and Geehyuk Lee
CHI '25 LBW (Extended Abstracts)   [LINK]

[5] **Pro-Tact: Hierarchical Synthesis of Proprioception and Tactile Exploration for Eyes-Free Ray Pointing on Out-of-View VR Menus**
Yeonsu Kim, Jisu Yim, <u>Kyunghwan Kim</u>, Yohan Yun, and Geehyuk Lee
UIST '24   [LINK]

[4] **STButton: Exploring Opportunities for Buttons with Spatio-Temporal Tactile Output**
Yeonsu Kim, Jisu Yim, Jaehyun Kim, <u>Kyunghwan Kim</u>, and Geehyuk Lee
CHI '24 Interactivity (Extended Abstracts)   [LINK]
🏆 *Honorable Mention*: *Jury's Best Demo Recognition*

[3] **Evaluation of visual, auditory, and olfactory stimulus-based attractors for intermittent reorientation in virtual reality locomotion**
Jieun Lee, Seokhyun Hwang, <u>Kyunghwan Kim</u>, and SeungJun Kim
Springer Virtual Reality '24   [LINK]

[2] **Virtual Rolling Temple: Expanding the Vertical Input Space of a Smart Glasses Touchpad**
<u>Kyunghwan Kim</u>, and Geehyuk Lee
UIST '23 Demo (Adjunct)   [LINK]

[1] **Auditory and Olfactory Stimuli-Based Attractors to Induce Reorientation in Virtual Reality Forward Redirected Walking**
Jieun Lee, Seokhyun Hwang, <u>Kyunghwan Kim</u>, and SeungJun Kim
CHI '22 LBW (Extended Abstracts)   [LINK]

Patents

[3] **System for Providing Interaction (Spatiotemporal Tactile-Output Button for Feedforward and Feedback)**
Geehyuk Lee, Yeonsu Kim, Jisu Yim, Jaehyun Kim, and <u>Kyunghwan Kim</u>
KR 10-2024-0176351, Application Date: 02 Dec. 2024

[2] **Utilizing the Think-aloud Protocol and Generative AI Models to Identify Problematic Moments in Lengthy Recordings of XR User Study**
Geehyuk Lee, Sunbum Kim, and <u>Kyunghwan Kim</u>
KR 10-2024-0030536, Application Date: 04 Mar. 2024

[1] **Method and Device for Enabling 2D Input Using Linear Touch Sensor and Laser Speckle Sensor**
Geehyuk Lee, and <u>Kyunghwan Kim</u>
KR 10-2024-0006763, Application Date: 16 Jan. 2024

Academic Services

Student Volunteer   **UIST** '25
ISMAR '25
SIGCHI Korea Local Chapter '25

Skills

Extended Reality   **Unity** & C# (with Meta Quest 2, VIVE Pro Eye, HoloLens 2, ZED Mini, Mixed Reality Toolkit, and OpenXR)
Programming   **C**, **Arduino**, Python (+ Tensorflow, Pytorch), JavaScript, VBS
Design & Prototyping   *Adobe*: **Premiere**, **Photoshop**, Illustrator | *Autodesk*: **Fusion 360**, **Eagle**, Sketchbook
Linguistic   *Native*: **Korean** | *Fluent*: **English** (**TOEIC 970**/990 (April 2022), **New TEPS 448**/600 (May 2022))

Teaching Experiences

Wearable User Interface (CS486), KAIST   *Spring 2024*
Teaching Assistant
· Organized hands-on practice sessions on Arduino physical user interfaces and provided comments on class team projects for CHI LBW.
· 🏆 *Outstanding TA of the Semester Award* (Top 22/154 TAs)

Introduction to System Programming (CS230), KAIST   *Spring 2023 and Spring 2025*
Teaching Assistant
· Coordinated the course project on building a simple machine language compiler.

Computer Programming (GS1401), GIST *Spring 2018 and Spring 2022*

TEACHING ASSISTANT
· Assisted weekly lab sessions, supported lecture Q&A, and developed practice questions across two semesters (85 and 108 students)

Open GIST Science Lab, GIST *Jul. 2017*

SESSION ASSISTANT
· Assisted local high school students' Raspberry Pi experiments in a social contribution event of GIST.

Extracurricular Activities

Daedeok Toastmasters: International Association to Develop Public Speaking Skills *Jul. 2023 ~ Present*

VICE PRESIDENT OF EDUCATION *(Sep. 2023 ~ Mar. 2024)*
· Provided feedback on public speeches and managed members' *Pathway* progress, along with club materials design.

EAT (English Adventure Time): GIST English Conversation Club *Dec. 2020 ~ Dec. 2022*

PRESIDENT, MENTORING & FEEDBACK MANAGER | *Advisor: Prof. Ellis Lee, Prof. John Wills*
· Provided counsel for student hosts of each session about conversational skills and overall speech management.
· Planned and designed various club activities and help-out materials in collaboration with the professors.

GDSC (Google Developer Student Clubs) GIST *Oct. 2021 ~ Jul. 2022*

CORE TEAM: RESEARCH & DEVELOPMENT DIVISION
· Planned and managed the club's technical roadmap, co-led the AI/ML division, and maintained the club website.
· Hosted a 'CV Yourself With Overleaf' session for college students, delivering core CV concepts and guidance to draft CVs with a template.

G.OnNaRae: GIST Student Ambassador *Sep. 2017 ~ Dec. 2018*

FOREIGN GUEST PROTOCOL MANAGER, WEB CONTENTS DESIGNER, AND OFFICIAL BLOG MANAGER
· Provided on-site protocol support for international/VIP visitors, conducting guided tours and assisting scheduled visits.
· Planned and ran various on/offline promotional events, and designed SNS content for the school's branding and communication.

GIST Toastmasters: International Association to Develop Public Speaking Skills *Sep. 2017 ~ Dec. 2018*

VICE PRESIDENT OF IT AND DESIGN
· Supported club operations and member development by delivering regular speech evaluations and constructive feedback.
· Designed and established foundational club materials and homepage, including branding assets, templates, and event materials.

My Little GIST: GIST Infinite Challenge Project *May. 2017 ~ Jan. 2018*

TEAM LEADER, EXECUTIVE PRODUCER, AND VIDEO EDITOR
· Produced 10 video clips ranging from daily campus life to short films, receiving positive feedback from the campus community.

Scholarships & Fundings

Government Funded Scholarship for KAIST Graduate Students *Spring 2023 ~ Present*
KAIST *KRW 8,800,000 (USD 6,500) per semester*

Funding for Student Projects on Enhancing the UX of Productivity Tools in AR *Jul. 2024 ~ Dec. 2024*
KAIST SPACETOP RESEARCH CENTER *KRW 7,000,000 (USD 5,200) in total*

Government Funded Scholarship for GIST Undergraduate Students *Spring 2017 ~ Fall 2022*
GIST COLLEGE *KRW 3,400,000 (USD 2,500) per semester*

Scholarship for High Academic Achievement *Fall 2017 and Spring 2021*
GIST COLLEGE *KRW 720,000 (USD 540) per semester*

Funding for Summer Session Program at UC Berkeley *Summer 2018*
GIST COLLEGE *(More details in the Education section)* *KRW 8,000,000 (USD 6,000) in total*

Funding for GIST Infinite Challenge Project *May. 2017 ~ Jan. 2018*
GIST COLLEGE *(More details in the Extracurricular Activities section)* *KRW 7,000,000 (USD 5,200) in total*

Military Service

Republic of Korea Air Force (ROKAF) – *Obligation Fulfilled* *Jan. 2019 ~ Nov. 2020*

AIR FORCE OPERATIONS COMMAND (AFOC) S&S GROUP, GROUND TRANSPORT MANAGEMENT TEAM
· Automated vehicle managerial workflow with HanCell VBA (similar to Excel VBS) scripting.
· 🏆 ***Distinguished Trainee Award*** *(8th/1,560 Recruits)*