# Auejin Ham


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| Languages | Korean Native • English TOEIC 930, TOEFL PBT 610 |


## Biography

I design interaction paradigms that translate complex human intent into precise machine execution — spanning low-level physical sensors, haptic interfaces and multi-agent AI systems.

My work began with physical constraints where ground-truth answers exist. At 17, I built an eye-tracking phone interface for quadriplegic users that earned a spot on Korea's Intel ISEF delegation. As a researcher at DGIST, KAIST and NVIDIA Research, I quantified the millisecond-level impacts of latency and jitter on human performance, publishing first-author work at top-tier HCI venues like ACM UIST.

I extended this focus to subjective, ungrounded interactions as Technical Research Personnel at bHaptics. There, I engineered real-time tactile software pipelines across iOS, Android and Windows with sub-20 ms latency, turning open-ended human perception into reliable, deployed software products.

Currently, as a Technical PM and Software Engineer at Cupix, I design systems that govern the stochastic nature of LLMs through deterministic engineering. I built Issue Fixer, an autonomous agent system that operated unattended for five months — processing 924 production bugs with a 92.2% root-cause accuracy. I also engineered Isopod, a multi-agent harness that converts natural-language specs into state machines, and led the technical delivery of Beacon Chat, a conversational AI product for construction digital twins.

Across physical sensing, user studies and agentic orchestration, my goal is to lead multi-disciplinary teams in defining the next interface standard for complex AI environments — turning ungrounded, probabilistic interactions into rigorous, real-world systems.

## Education

**Korea Advanced Institute of Science and Technology (KAIST), M.S. in Computer Science** — Mar 2021 – Feb 2023

*Advisor: Geehyuk Lee · GPA 3.81 / 4.3*

*Thesis*: Fishing Things — A time-series-based bidirectional interaction protocol that minimizes mis-selection in dense smart-home environments.

**Daegu Gyeongbuk Institute of Science and Technology (DGIST), B.S. in Interdisciplinary Engineering** — Mar 2017 – Feb 2021

*GPA 3.44 / 4.3*

*Thesis*: Development of a conversational chatbot for emotional exchange based on intake-interview data, and a study of its interaction

Summer Visiting Student, UC Berkeley — Jun 2017 – Aug 2017

## Publications

### Conference Full Papers

ACM CHI and UIST are the top-tier venues in Human-Computer Interaction.

[3] **Lattice Menu: A Low-Error Gaze-Based Marking Menu Utilizing Target-Assisted Gaze Gestures on a Lattice of Visual Anchors**
Taejun Kim, **Auejin Ham**, Sunggeun Ahn, Geehyuk Lee
In Proc. CHI 2022 (12.5% acceptance)

[2] **Do We Need a Faster Mouse? Empirical Evaluation of Asynchronicity-Induced Jitter**
**Auejin Ham**, Junsu Lim, Sunjun Kim
In Proc. UIST 2021 (25.9% acceptance)

[1] **Secrets of Gosu: Understanding Physical Combat Skills of Professional Players in First-Person Shooters**
Eunji Park, Sangyoon Lee, **Auejin Ham**, Minyeop Choi, Sunjun Kim, Byungjoo Lee
In Proc. CHI 2021 (26.3% acceptance)

### Journal Papers

[1] **TouchWheel: Enabling Flick-and-Stop Interaction on the Mouse Wheel**
Sunmin Son, Jingun Jung, **Auejin Ham**, Geehyuk Lee
International Journal of Human-Computer Interaction (IF 4.92)

### Posters, Workshops & Preprints

[4] **Short-time, Wavelet-inspired Mouse Submovement Detection**
**Auejin Ham**, Ben Boudaoud
arXiv 2026

[3] **Mine Yourself!: A Role-playing Privacy Tutorial in Virtual Reality Environment**
Junsu Lim*, Hyeonggeun Yun*, **Auejin Ham***, Sunjun Kim
Late-Breaking Work at CHI 2022 (36.0% acceptance)

[2] **WonderScope: Practical Near-surface AR Device for Museum Exhibits**
HyeonBeom Yi, Yeeun Shin, Sehee Lee, Eunhye Youn, **Auejin Ham**, Geehyuk Lee, Woohun Lee
Emerging Technologies at SIGGRAPH 2022 (20.0% acceptance)

[1] **Chatbot with Touch and Graphics: An Interaction of Users for Emotional Expression and Turn-taking**
Hyeonggeun Yun, **Auejin Ham**, Jin Kim, Taeyeong Kim, Jeongeun Kim, Haechan Lee, Jongrae Park, Jinkyu Jang
ACM CHI Workshop (CUI@CHI) 2020

## Experience

**Software Engineer @ Cupix** May 2025 – Present

A company that turns buildings and construction sites into 3D digital twins people can look back through. I work on the frontend and as technical PM. Sites lose network, yet the desktop app fetched everything from the server, and QA filed bugs faster than the team could absorb them. I built an offline mode that stores every entity's metadata and every image locally, and a hybrid layer that switches between the real API and the local database according to connectivity without changing a single call site. Edits made offline synchronise automatically on reconnection. I proposed and ran the company's first workflow in which AI agents carry out development work, and served as technical PM for Beacon, its conversational AI product.

**Software Engineer @ bHaptics** Feb 2023 – Apr 2025

A company making wearables that deliver touch through vibration. I worked on the apps and the SDK as technical research personnel. The hardware existed, but something had to carry what happens inside a PC or PSVR game onto the body. I built the control apps on iOS (SwiftUI), Android (Jetpack Compose) and Windows (WPF), talked to the hardware over BLE and TCP including firmware update (DFU), and turned live PC-game events into haptic signals. I designed the GitHub Actions CI/CD that automated release across all three platforms.

**Master's Degree Program @ HCI Lab, KAIST** 2021 – 2023

*Advisor: Geehyuk Lee*

Master's course at the KAIST HCI Lab. My subjects were gaze-based menu selection and touch interaction on the mouse wheel. I drove haptic actuators directly, implemented the wireless messaging pipeline, and built the tools used to author haptic interaction. The work appeared at ACM CHI 2022 and in the International Journal of Human-Computer Interaction.

**Research Intern @ NVIDIA Research** Jun 2022 – Nov 2022

*Advisor: Joohwan Kim, Ben Boudaoud*

Measured how professional gamers aim, at NVIDIA Research. The question was how aiming performance changes as display and input-device conditions change. I measured and compared across conditions, and proposed a short-time, wavelet-inspired method for detecting mouse submovements. arXiv 2026, first author.

**Research Intern @ Smart Input Device Lab, DGIST** Jun 2020 – Feb 2021

*Advisor: Sunjun Kim*

Undergraduate researcher at the DGIST Smart Input Device Lab. When a mouse's polling rate falls out of step with the display refresh the cursor jitters, and how much that costs a person's aim was not known. I built a rig that logs 8000 Hz input without loss and measured the cost experimentally, and analysed the Oculus Touch haptic feedback API. ACM UIST 2021, first author.

**Research Intern @ Interactive Media Lab, KAIST** Jun 2019 – Jul 2020

*Advisor: Byungjoo Lee*

Undergraduate intern at the KAIST Interactive Media Lab. Behavioural-measurement devices drift apart in time when run together, so they stop pointing at the same instant. I implemented a UDP protocol that records eight sensor types — eye tracker, motion tracker, webcam, Arduino — against one timestamp, and built a Pupil Labs serialisation library and a CS:GO scene-analysis system. Data gathered on that rig went into Secrets of Gosu (ACM CHI 2021).

**Software Engineer @ waddleLab, KAIST** Aug 2018 – Dec 2018

Software developer at a startup in the KAIST startup incubator. Computers for blind users cost several thousand dollars, and a phone's voice guidance reads everything aloud to whoever is standing nearby. I built a braille input and output device shaped like a phone case, and the iOS application that drives it over Bluetooth. Demonstrated to investors at KAIST TECH DAY.

**World Friends ICT Project @ Can Tho University, Vietnam** Jun 2018 – Aug 2018

A month at Can Tho University in Vietnam with the World Friends ICT volunteer programme. Together with the university I built a system that lends and returns motorcycle parking spaces through NFC-tagged student cards.

**Vice Manager @ Blackwind Computing Group, DGIST Supercomputing Center** 2017

Vice manager and head of outreach for a working group under the DGIST Supercomputing Center. I worked with the centre's compute resources and taught an introductory Python course to members.

## Projects & Systems

**Beacon Chat** Aug 2026

An LLM chat server and panel UI over a SaaS that captures construction sites in 3D. When someone asks how many safety findings sit on level three, one number stops work and settles invoices. Code grades every search result before the model speaks — complete set or sample — and the grade constrains which sentence the model is permitted to write. Where the grade is low the system asks back and narrows the scope. The model earns its confidence through conversation rather than imitating it: the path from a sample to a complete set runs through the dialogue itself.

**Isopod** Aug 2026

A harness that makes multiple agents carry a natural-language development spec through to the end. A spec written by a person leaves too much room for interpretation for a machine to judge how far it has got. It pins the spec into a checkable state machine, splits it into work cards on a dependency graph, and runs agents with no human intervention until the graph is drained, producing verified commits. Progress is measured by what is left in the graph rather than by what an agent reports.

**Issue Fixer** Feb 2026

An agent system that owns a production bug queue end to end. Most of the time a bug costs goes not into the fix but into working out what broke under which conditions. It polls Jira and picks its own issues, compresses the attached recording into keyframes for a VLM to recover the capture conditions, then reproduces in a real browser, fixes, refutes its own fix with a before/after check, and opens the pull request. The point is that an LLM saying it is done never counts as the completion signal — verdicts are demoted to typed enums — and a biweekly self-audit files improvement pull requests against its own code.

*5 months unattended in production · 924 issues ingested · 571 PRs generated automatically · ~30 min per issue · 50.0% merge rate · 92.2% root-cause accuracy*

**AR Photo Booth** Sep 2024

An unattended kiosk that composites a person in a full-body costume between illustrated character layers and prints the result on the spot. Convention booths have unreliable networks, and a costume's fur and trim make an outline that chroma keying cannot cut cleanly. From a single webcam, SAM2 separates the person and Depth-Anything-V2 estimates depth, placing them between the illustration layers. Everything runs on the device. No green screen and no server: the booth is self-contained. Run at seven conventions in South Korea between 2024 and 2026.

**VZZK** Jul 2024

A desktop bot app for streamers on Chzzk, Naver's live-streaming platform. Reading chat, answering donations and running screen effects while broadcasting is more than one person can hold at once. It takes chat and donation events over a socket, runs eleven kinds of bot, and draws

the results as a live overlay on the OBS scene — a Tauri v2, Angular and Rust (actix-web) desktop app with a NestJS cloud API. Three operating-system builds are published through GitHub Actions, run single-handed without a commercial release service.
*56,000+ downloads · 55,600+ broadcasts served*

**bHaptics Player for iOS** Apr 2024

An iOS application (SwiftUI) that drives bHaptics vests and gloves. To feel what happens in a game on your body, something has to sit between the PC or PSVR title and the hardware in real time. It finds supported titles on the same Wi-Fi network by itself, takes their events, and relays them over BLE in under 20 ms, alongside firmware update (DFU) and account flows. It ships with a Swift SDK folding device state and account state into the SwiftUI lifecycle, so the app and the SDK share one state machine.
*8,700+ downloads · 400+ active users*

**FastPlot** May 2022

A Python library that animates values arriving over a serial port in real time. Watching what an Arduino is sending means writing a matplotlib animation loop again every time. You pass the port and the fields to draw; the library owns the update loop and the axes.

**TUG** Dec 2021

A real-time web platform for forming teams in KAIST classes. Remote teaching through the pandemic removed the places where students get to know each other, leaving nothing to judge a prospective teammate by. A quiz surfaces candidates with matching interests, an anonymised chat with a moderating bot lets them talk, and a credit record shows how much each person contributed to earlier group projects. Built on React and the Firebase realtime database. Anonymity lowers the social cost of choosing while the credit record still exposes a history of free-riding, so a choice can be both comfortable and informed.

**GetSetPress** Jul 2021

A rig that mimics the physical behaviour of mechanical keys in order to find the right activation method for a touch keyboard. A touch keyboard gives no sensation at the moment of contact, so the hand cannot tell when the key registered. Press depth, restoring force and other physical parameters are adjustable; capacitive sensing and an RF power detector measure contact, and multiplexing reads the key array. The control side is WPF and Arduino. Activation is a variable to sweep rather than a fixed design constant, so the best point can be found by experiment.

**ICUC** Jun 2021

A system that lets two people in augmented-reality glasses see where the other is looking in the same room. Speech and pointing are thin instruments for singling out something far away, and the moment you look at a handheld device you look away from the site. Using HoloLens 2 it measures each person's eye and head direction, finds the moment their regions of interest coincide, and outlines that target in both headsets at once. Built in Unity (C#), sharing a coordinate frame through Azure Spatial Anchors and replicating state over Photon Unity Networking. Rather than showing gaze continuously it shows it only where two people's attention meets, so the cue itself signals agreement.

**Intuitive Sensor Logger** Jul 2020

A toolkit that records several behavioural-measurement devices against a single timestamp. Each device runs its own clock, so signals logged separately do not line up on the same instant afterwards. It drives the devices together over UDP and serial, and cuts the number of system calls crossing the OS pipe to hold clock drift to 11 microseconds per second. Built with Arduino and Processing (Java). Eight kinds of sensor at once — eye tracker, motion tracker, webcam, EMG. The data it collected went into Secrets of Gosu (ACM CHI 2021).

**Chatbot with Touch and Graphics** May 2020

An interaction technique (TwG) that carries emotion and turn-taking to a chatbot through touch. Chatbots have been treated in terms of natural language processing for text conversation, leaving little means to convey a user's emotion or manage whose turn it is. Users send emotion and hand over the turn by touching a graphic interface; a Wizard of Oz study evaluated the resulting experience. Emotional expression improved over conventional text-only chatbot interaction, and turn-taking became more natural.

**JupilLabs** Mar 2020

A library that brings Pupil Labs eye-tracker data into Processing (Java). The tracker's stream arrives as MessagePack over ZeroMQ, and Processing had nothing to unpack it. It wraps the subscription and the deserialisation and hands over JSON packets.

**Eagle Eye** May 2019

A VR interface for operating a crane. Crane control carries three problems at once — dizziness, the safety of people nearby, and distance perception. HIAB Korea posed the subject. The viewpoint and the control scheme were designed against all three together. Winner of the logistics and physical-computing track at Junction X Seoul.

**ProjectedAssistant** Apr 2019

A system that throws a voice assistant's graphical interface onto a wall or desk with a projector. A voice-only assistant has no way to hand over a list or a table, and a fixed screen only works if you walk to it. Kinect v2 finds the person and the surface, Arduino PWM steers the projector, and the display lands where it can be seen. Built in WPF (C#) and evaluated with a Wizard of Oz study and NASA-TLX. The display follows the person, so using the assistant is no longer tied to wherever the speaker sits.

**Pinch & Draw** Jan 2019

A technique that takes mid-air pinch gestures as input before the hand reaches a vertical mouse. A vertical mouse is held with the wrist upright, so nothing can be entered until the hand is already on it. It recognises the pinch trajectory in eight directions: left, right, upper left, lower left, upper right, lower right, up and down. The seconds before the hand touches the mouse become usable input time.

**Kaimaru Infographic Project** Oct 2018

An infographic of the lunchtime queue at the campus cafeteria. Avoiding the crush meant walking over to check. Queue length was collected by time of day and plotted.

**Winklick** Dec 2016

An interface that operates an Android phone with the eyes alone. Someone with quadriplegia cannot touch the screen, and gaze by itself settles where to look but not when to press. It follows the gaze trajectory through a webcam to place the point, takes a wink as the press signal, and injects the touch event over ADB. Together they cover the whole design space of single-point touch — tap, long press, drag — using eyes and eyelids only.

## Teaching & Mentoring

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| Invited Talk @ XREAL | May 2024 |
| Invited Talk @ Human-Automated Vehicle Interaction Design (002673), Hongik University | Oct 2023 |
| Teaching Assistant @ Wearable Interface (CS492), KAIST | 2022 |
| Teaching Assistant @ Discrete Mathematics (CS204), KAIST | 2021 |
| Undergraduate Tutor @ Introduction to Programming (SE213a), DGIST | 2019 |

## Academic Service

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| Reviewer, ACM UIST 2025 Full Papers | 2025 |
| Reviewer, ACM CHI 2024 Full Papers | 2024 |
| Reviewer, ACM DIS 2023 Papers and Pictorials | 2023 |

## Awards & Honors

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| iF Design Award | 2023 |
| KAIST Outstanding TA Award | 2022 |
| ACM SIGGRAPH Best In Show Honorable Mention Award | 2022 |
| ACM SIGCHI Honorable Mention Award (top 5%) | 2021 |
| DGIST UGRP Excellence Prize — 2nd place | 2020 |
| Junction X Seoul Track Winner | 2019 |
| Presidential Science Scholarship | 2018 |
| International Science and Engineering Fair Finalist | 2016 |
| Talent Award of Korea | 2016 |
| Seoul Student Science Research Competition — Special Prize (Grade 1) (Grade 1) | 2015 |
| Korea Olympiad in Informatics (Creation Division) — Silver | 2015 |
| Korea Olympiad in Informatics (Creation Division) — Bronze | 2014 |

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| Korea Youth Science Creativity Contest (ISEF-K) — Special Award | 2014 |
| KOI Essay and Media Contest — Media Division, Gold | 2014 |
| Korea Olympiad in Informatics (Creation Division) — Grand Prize | 2013 |

## Technical Skills

**Agent Systems, Reinforcement Learning** — LLM multi-agent orchestration harness design (state-machine formalisation, task dependency graphs, failure taxonomies, checkpoint resume) · Model Context Protocol tool integration, VLM-based screen adjudication, browser automation · Agent Experience (AX) workflow design — AI-then-Human development processes wired through Jira, Slack, GitHub and Azure · Reinforcement learning (OpenAI Gym), computer vision (OpenCV), PyTorch

**Spatial Computing, Gesture-based Interface, Behavioral Sensors** — AR/VR (Apple Vision Pro, Oculus Quest, Microsoft Hololens), Body Tracking (Microsoft Kinect, OptiTrack Motive, LEAP Motion) · Eye Gaze (Tobii Eye Tracker, SMI iViewRED, PupilLabs, FOVE VR), EMG (MYO Armband) · Touch & Press (bHaptics TactSuit, Sensel Morph, Wooting Keyboard)

**Rapid Prototyping** — iOS & Mac & Apple Vision Pro (SwiftUI), Android (Jetpack Compose) · WPF & .NET MAUI & Microsoft Hololens (C#), Unity (C#), React & Electron or Tauri (TypeScript) · Processing 3 (Java), Figma · Firmware Development (ESP32, Arduino)

**User Experiment, Data Analysis & Visualization** — Mixed-methods study design and operation (within- and between-subjects), performance measurement (completion time, accuracy, error rate), NASA-TLX, semi-structured interviews, Wizard of Oz evaluation · SPSS, JASP, Matlab, R, pandas, scipy, pingouin, seaborn, matplotlib, jupyter

**Real-time Data Collection, Messaging Platform Implementation** — Sensing and Recording Low-level Sensor Data (SPI, I2C, Windows HID) · Designing Peer-to-Peer Wireless Networking Protocol (UDP, TCP, RESTful API, BLE UART, Wi-Fi) · Real-time Data Integration System (Photon Unity Networking RPC, ZeroMQ, MessagePack)

**Signal Processing, Sensor Fusion, Time Series Analysis** — Recording, Denoising, and Analyzing High-frequency Time Series Data · Prediction Models, Clock Drift Analysis, Covariance-based Multi-Kalman-Filter Fusion