Hyunsung Cho

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RESEARCH INTERESTS

Keywords: Context-aware Computing, Extended Reality (XR), Computational Modeling, Multimodal Interactions.

My research explores ways to augment human capabilities through context-aware digital support. I **envision a seamless digital companion** that understands the user's context and situation, providing seamless **support for everyday tasks without cognitive burden or interaction friction**, enabled by the convergence of Extended Reality (XR) and artificial intelligence (AI). My work focuses on two complementary approaches: (1) presenting digital information spatially without clutter and interruption and (2) creating intuitive interaction mechanisms for **everyday XR+AI assistants**.

EDUCATION

Carnegie Mellon University
Ph.D. student in Human-Computer Interaction *Aug. 2021 -*
Advisor: David Lindlbauer

Korea Advanced Institute of Science and Technology (KAIST)
Ph.D. student in Computer Science (Transferred to Carnegie Mellon University) *Mar. 2020 - Apr. 2021*
Advisor: Sung-Ju Lee

Korea Advanced Institute of Science and Technology (KAIST)
M.S. in Computer Science *Mar. 2018 - Feb. 2020*
Advisor: Sung-Ju Lee
Thesis: Private Status Sharing and Sender-Controlled Notifications in Mobile Instant Messaging
Thesis Committee: Sung-Ju Lee, Juho Kim, Youn-kyung Lim

Korea Advanced Institute of Science and Technology (KAIST)
B.S. in Computer Science (Software Advanced Major) *Aug. 2013 - Feb. 2018*
Magna Cum Laude

PUBLICATIONS

Conference & Journal Papers

[c.18] **Persistent Assistant: Seamless Everyday AI Interactions via Intent Grounding and Multimodal Feedback**
Hyunsung Cho, Jacqui Fashimpaur, Naveen Sendhilnathan, Jonathan Browder, David Lindlbauer, Tanya R. Jonker, and Kashyap Todi.
CHI 2025: ACM CHI Conference on Human Factors in Computing Systems

[c.17] **A Dynamic Bayesian Network-Based Framework for Multimodal Context-Aware Interactions**
Violet Yinuo Han, Tianyi Wang, Hyunsung Cho, Kashyap Todi, Ajoy Savio Fernandes, Andre Levi, Zheng Zhang, Tovi Grossman, Alexandra Ion, Tanya R. Jonker.
IUI 2025: ACM Conference on Intelligent User Interfaces

[c.16] **Evaluating Dynamic Delivery of Audio+Visual Message Notifications in XR**
Hyunsung Cho, Drew Edgar, David Lindlbauer, Joseph O'Hagan.
IEEE VR 2025: IEEE Conference on Virtual Reality and 3D User Interfaces

[c.15] **Push2AR: Enhancing Mobile List Interactions Using Augmented Reality.**
Jonathan Wieland, Hyunsung Cho, Sebastian Hubenschmid, Akihiro Kiuchi, Harald Reiterer, David Lindlbauer.
ISMAR 2024: IEEE International Symposium on Mixed and Augmented Reality

[c.14] **Auptimize: Optimal Placement of Spatial Audio Cues for Extended Reality.**
Hyunsung Cho, Alexander Wang, Divya Kartik, Emily Liying Xie, Yukang Yan, and David Lindlbauer.
UIST 2024: ACM Symposium on User Interface Software and Technology

[c.13] **SonoHaptics: An Audio-Haptic Cursor for Gaze-Based Object Selection in XR.**
Hyunsung Cho, Naveen Sendhilnathan, Michael Nebeling, Tianyi Wang, Purnima Padmanabhan, Jonathan Browder, David Lindlbauer, Tanya R. Jonker, and Kashyap Todi.
UIST 2024: ACM Symposium on User Interface Software and Technology

[c.12] **MineXR: Mining Personalized Extended Reality Interfaces.**
Hyunsung Cho, Yukang Yan, Kashyap Todi, Mark Parent, Missie Smith, Tanya Jonker, Hrvoje Benko, and David Lindlbauer.
CHI 2024: ACM CHI Conference on Human Factors in Computing Systems

[c.11] **BlendMR: A Computational Method To Create Ambient Mixed Reality Interfaces.**
Violet Han, Hyunsung Cho, Kiyosu Maeda, Alexandra Ion, and David Lindlbauer.
ISS 2023: ACM Interactive Surfaces and Spaces Conference
🏆 **Best Paper Award**

[c.10] **FinerMe: Examining App-level and Feature-level Interventions to Regulate Mobile Social Media Use.**
Adiba Orzikulova, Hyunsung Cho, Hye-Young Chung, Hwajung Hong, Uichin Lee, and Sung-Ju Lee.
CSCW 2023: ACM Conference on Computer Supported Cooperative Work and Social Computing

[c.9] **RealityReplay: Detecting and Replaying Temporal Changes In Situ using Mixed Reality.**
Hyunsung Cho, Matthew L. Komar, and David Lindlbauer.
IMWUT (UbiComp) 2023: ACM Annual Conference on Interactive, Mobile, and Ubiquitous Technologies

[c.8] **A Survey on Remote Assistance and Training in Mixed Reality Environments.**
Catarina Gonçalves Fidalgo, Yukang Yan, Hyunsung Cho, Mauricio Sousa, David Lindlbauer, and Joaquim Jorge.
TVCG 2023: IEEE Transactions on Visualization and Computer Graphics

[c.7] **FLAME: Federated Learning Across Multi-device Environments.**
Hyunsung Cho, Akhil Mathur, and Fahim Kawsar.
IMWUT (UbiComp) 2022: ACM Annual Conference on Interactive, Mobile, and Ubiquitous Technologies

[c.6] **You Are Not Alone: How Trending Stress Topics Brought #Awareness and #Resonance on Campus**
Ryuhaerang Choi, Chanwoo Yun, Hyunsung Cho, Hwajung Hong, Uichin Lee, and Sung-Ju Lee.
CSCW 2022: ACM Conference on Computer Supported Cooperative Work and Social Computing

[c.5] **Prediction for Retrospection: Integrating Algorithmic Stress Prediction into Personal Informatics Systems for College Students' Mental Health.**
Taewan Kim, Haesoo Kim, Ha Yeon Lee, Hwarang Goh, Shakhboz Abdigapporov, Mingon Jeong, Hyunsung Cho, Kyungsik Han, Youngtae Noh, Sung-Ju Lee, and Hwajung Hong.
CHI 2022: ACM CHI Conference on Human Factors in Computing Systems

[c.4] **Reflect, not Regret: Modeling Behaviors of Regretful Smartphone Use with App Feature-Level Analysis.**
Hyunsung Cho, DaEun Choi, Donghwi Kim, Wan Ju Kang, Eun Kyoung Choe, and Sung-Ju Lee.
CSCW 2021: ACM Conference on Computer Supported Cooperative Work and Social Computing
🏆 **Best Paper Award &** 🏆 **Methods Recognition**

[c.3] **I Share, You Care: Private Status Sharing and Sender-Controlled Notifications in Mobile Instant Messaging.**
Hyunsung Cho, Jinyoung Oh, Juho Kim, and Sung-Ju Lee.
CSCW 2020: ACM Conference on Computer Supported Cooperative Work and Social Computing

[c.2] **Knocker: Vibroacoustic-based Object Recognition with Smartphones.**
Taesik Gong, Hyunsung Cho, Bowon Lee, and Sung-Ju Lee.
IMWUT (UbiComp) 2019: ACM Annual Conference on Interactive, Mobile, and Ubiquitous Technologies

[c.1] **Intelligent Positive Computing with Mobile, Wearable, and IoT Devices: Literature Review and Research Directions.**
Uichin Lee, Kyungsik Han, Hyunsung Cho, Kyong-Mee Chung, Hwajung Hong, Sung-Ju Lee, Youngtae Noh, Sooyoung Park, and John M. Caroll.
Ad Hoc Neworks Journal, Voulme 83, 2019

Preprints

[a.2] **Augmented Reality In-the-Wild: Usage Patterns and Experiences of Working with AR Laptops in Real-World Settings.**
Yi Fei Cheng, Ari Carden, Hyunsung Cho, Catarina G Fidalgo, Jonathan Wieland, and David Lindlbauer.
arXiv:2502.14241

[a.1] **Social Media Isn't Just Instagram: A Youth-Envisioned Platform for Meaningful Social Connections.**
JaeWon Kim, Hyunsung Cho, Fannie Liu, and Alexis Hiniker.
arXiv:2502.06696

Posters, Demos, and Workshop Papers

[p.8] **MineXR: Mining Personalized Extended Reality Interfaces**
Hyunsung Cho, Yukang Yan, Kashyap Todi, Mark Parent, Missie Smith, Tanya Jonker, Hrvoje Benko, and David Lindlbauer.
CHI 2024 Workshop: Computational Methodologies for Understanding, Automating, and Evaluating User Interfaces

[p.7] **Evaluating Adaptive XR Systems**
Hyunsung Cho, Yi Fei Cheng, Yukang Yan, and David Lindlbauer.
CHI 2023 Workshop: The Future of Computational Approaches for Understanding and Adapting User Interfaces

[p.6] **Facilitating Instant Interactions for Stressful Experiences Sharing and Peer Support.**
Ryuhaeraeng Choi, Chanwoo Yun, Hyunsung Cho, Hwajung Hong, Uichin Lee, and Sung-Ju Lee.
MobiSys 2022 Demos: ACM International Conference on Mobile Systems, Applications and Services

[p.5] **Device or User: Rethinking Federated Learning in Personal-Scale Multi-Device Environments.**
Hyunsung Cho, Akhil Mathur, and Fahim Kawsar.
AIChallengeIoT 2021: ACM SenSys 2021 Workshop on Challenges in Artificial Intelligence and Machine Learning for Internet of Things

[p.4] **I Share, You Care: Private Status Sharing and Sender-Controlled Notifications in Mobile Instant Messaging.**
Hyunsung Cho, Jinyoung Oh, Juho Kim, and Sung-Ju Lee.
CSCW 2020 Demos: ACM Conference on Computer Supported Cooperative Work and Social Computing

[p.3] **Sender-Controlled Mobile Instant Message Notifications Using Activity Information.**
Hyunsung Cho, Jinyoung Oh, Juho Kim, and Sung-Ju Lee.
MobiSys 2019 Demos: ACM International Conference on Mobile Systems, Applications and Services

[p.2] **Real-Time Object Identification with a Smartphone Knock.**
Taesik Gong, Hyunsung Cho, Bowon Lee, and Sung-Ju Lee.
MobiSys 2019 Videos: ACM International Conference on Mobile Systems, Applications and Services
🏆 **Best Video Award**

[p.1] **Identifying Everyday Objects with a Smartphone Knock.**
Taesik Gong, Hyunsung Cho, Bowon Lee, and Sung-Ju Lee.
CHI 2018 Extended Abstract: ACM Conference on Human Factors in Computing Systems

WORK EXPERIENCE

Augmented Perception Lab, Pittsburgh, PA, USA *Aug. 2021 -*
Ph.D. Student
Advisor: David Lindlbauer. Research on a context-aware adaptive interface for Augmented Reality.

Meta Reality Labs, Redmond, WA, USA *May 2023 - Sep. 2023, May 2024 - Sep. 2024*
Research Intern
Manager: Kashyap Todi. Research on adaptive multimodal feedback for Extended Reality (XR) interfaces [c.13, c.18]

Nokia Bell Labs, Cambridge, UK *May 2021 - Jul. 2021*
Research Intern

Mentor: Akhil Mathur. Worked on federated learning research in multi-device settings at personal scale in Pervasive Systems Team [c.7]. Selected as a representative of Application Platforms & Software Systems Research Lab for global Bell Labs summer intern presentation (∼5%).

KAIST Networking and Mobile Systems Lab (NMSL), Daejeon, South Korea *Mar. 2017 - Apr. 2021*
Graduate Student
Advisor: Sung-Ju Lee. Research on context-aware computing to reduce digital distractions for digital wellbeing [c.1-c.6, c.10].

Kiswe Mobile Inc., New Providence, NJ, USA *Jun. 2017 - Aug. 2017*
Web Frontend Developer
Developed a trivia widget for interactive mobile sports streaming service. The widget was included in the live service for the IAAF Diamond League event in collaboration with VRT Sporza. The service was covered in press. Developed tools to support video streamers such as a multi-view layout editor for multi-cam videos; an easy drag-and-drop thumbnail uploader; and a live streaming control interface.

KAIST Interaction Lab (KIXLAB), Daejeon, South Korea *Dec. 2015 - Feb. 2017*
Research Intern
Advisers: Jihee Kim and Juho Kim. Research on analysis of presidential election promises in relation with government budget expenditure data through crowdsourcing.

AWARDS & HONORS

Best Paper Award ACM ISS 2023 *2023*
BlendMR: A Computational Method to Create Ambient Mixed Reality Interfaces [c.11]

Best Paper Award ACM CSCW 2021 *2021*
Reflect, not Regret: Modeling Behaviors of Regretful Smartphone Use with App Feature-Level Analaysis [c.4]

Sponsored Research by Meta Reality Labs *2023-2025*

Special Recognitions for Outstanding Reviews *2020-2025*
IMWUT 2025, 3×CHI 2025, 3×UIST 2024, CHI LBW 2024, IMWUT 2023, CHI 2023, CHI 2022, CSCW 2021, CSCW 2020

SAP Travel Grant for 10th Heidelberg Laureate Forum *2023*

10th Heidelberg Laureate Forum Young Researcher *2023*

Methods Recognition ACM CSCW 2021 *2021*
Reflect, not Regret: Modeling Behaviors of Regretful Smartphone Use with App Feature-Level Analaysis [c.4]

Bell Labs Summer Intern Award for Outstanding Innovation *2021*
Nokia Bell Labs Global Intern Program 2021 [c.7]

NAVER Ph.D. Fellowship Award *2020*
$5K Academic scholarship, awarded based on research performance

Labmate of the Year *2020*
KAIST Networking & Mobile Systems Lab

Best TA Award *2019*
KAIST School of Computing

Google Women Techmakers Scholars *2019*
$1K Academic scholarship, awarded based on academic performance, leadership, and impact on the community of women in tech

Best Video Award *2019*
ACM MobiSys 2019 [p.2]

Best Poster/Demo Award *2018*
ACM SIGCHI Local Chapter [p.1]

Undergraduate Research Program *2016*
$2K Research grant awarded by KAIST

Runner-up in the 3rd Korea SW Hackathon *2016*
$3K Award by the Ministry of Science, ICT and Future Planning of Republic of Korea

National Science & Technology Scholarship *2014 - 2017*
Merit-based scholarships

ACADEMIC SERVICES

ACM UIST Registration Co-chair *2025*

ACM CHI Late Breaking Work Program Committee *2024, 2025*

ACM CHI Subcommittee Chair Assistant *2024*

CMU SCS Women/Non-binary Lunch Organizer *2023, 2024*

ACM CHI Student Volunteer *2024*

ACM UIST Student Volunteer *2021, 2022*

ACM MobiSys Student Volunteer *2019*

Reviewer
2025 CHI, IEEE VR, ISMAR, DIS, IMWUT, EuroXR, SIGGRAPH Poster
2024 CHI, UIST, IMWUT, ISMAR, MobileHCI, SUI, CHI LBW
2023 CHI, UIST, IMWUT, MobileHCI, CHI LBW, SIGGRAPH Poster
2022 CHI, UIST, IMWUT, IJHCI, PRESENCE, SIGGRAPH Poster
2021 CSCW, MobileHCI, CHI LBW, MobileHCI Poster
2020 CSCW, Computing Surveys

TEACHING EXPERIENCE

Guest Lecturer, Carnegie Mellon University *Feb. 2025*
05-499B Computational Methods for Interactive Systems (Prof. Alexandra Ion)

Guest Lecturer, University of Rochester *Nov. 2024*
CSC 211 Introduction to Human-Computer Interaction (Prof. Yukang Yan)

Guest Lecturer, University of Michigan *Nov. 2024*
SI 559 Introduction to AR/VR Application Design (Prof. Michael Nebeling)

Teaching Assistant, Carnegie Mellon University *Fall 2022*
05-430 Programming Usable Interfaces (Prof. Alexandra Ion)

Teaching Assistant, Carnegie Mellon University *Spring 2022*
05-391 Designing Human-Centered Software (Prof. Chris Harrison)

Head Teaching Assistant, KAIST *Spring 2019*
CS341 Introduction to Computer Networks (Prof. Sung-Ju Lee)

Teaching Assistant, KAIST *Fall 2018, Spring 2020*
CS341 Introduction to Computer Networks (Prof. Sung-Ju Lee)

Teaching Assistant, KAIST *Fall 2016 - Fall 2017, Fall 2020*
CS101 Introduction to Programming

Invited Student Panel, KAIST *Spring 2019*
CS492 Introduction to Research (invited by Juho Kim, Sung-Ju Lee, and Shin Yoo)

INVITED TALKS & EXHIBITIONS

Towards Everyday Extended Reality (XR)
Seoul National University, HCS Lab, hosted by Youngki Lee *Jan. 2025*

Towards Everyday Extended Reality (XR)
KAIST, hosted by Juho Kim *Dec. 2024*

Auptimize: Optimal Placement of Spatial Audio Cues for Extended Reality
Carnegie Mellon University, VASC Seminar *Oct. 2024*

Seamless & Unobtrusive Interaction in Extended Reality (XR)
KAIST, Networking & Mobile Systems Lab, hosted by Sung-Ju Lee *Jan. 2024*

AI in Weird Wonderland
Celine Park Gallery, Seoul, Korea *Mar. 2022*

Vibroacoustic-based Object Recognition with Smartphones
2019 IAT (Information Accessibility Technology) Conference *Nov. 2019*

Knocker: Vibroacoustic-based Object Recognition with Smartphones
KAIST Vision Hall, Daejeon, Korea *2018 -*

SELECTED PRESS

KAIST Breakthroughs, Can AI empower college students to be their own health agent? *Sep. 2022*

Tech Xplore, Researcher seeks to understand the regret behind social media use *Nov. 2021*

EurekAlert, Carnegie Mellon University researcher seeks to understand the regret behind social media *Nov. 2021*

Electronics Weekly, Sensor fusion lets phone identify objects by simply knocking against them *Oct. 2019*

Science Daily, Object identification and interaction with a smartphone knock *Oct. 2019*

NEW ATLAS, Smartphone tech recognizes objects by being knocked against them *Oct. 2019*

Nerdiest, This algorithm makes smartphones recognize objects just by Knocking them *Apr. 2018*

ICT NEWS, New application allows you to identify an object by tapping it with a smartphone *Apr. 2018*

Sporza, Sporza biedt interactieve primeur met Kiswe Mobile tijdens Diamond League Brussel *Aug. 2017*

PRWeb, VRT Sporza and Kiswe Offer End Users a First Ever Fully Interactive Mobile Experience Around Diamond League Brussels *Aug. 2017*

VRT Innovatie, Interactieve Primeur Tijdens Diamond League Brussel Met VRT Sandbox, Sporza & Kiswe *Aug. 2017*