Hyunsung Cho

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RESEARCH INTERESTS

Human-computer interaction, context-aware computing, mixed reality, computational interaction

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.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

Posters, Demos, and Workshop Papers

[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 context-aware interface in Mixed Reality.

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. Selected as representative of Application Platforms & Software Systems Research Lab for global Bell Labs summer intern presentation (∼5%).

- **Federated Learning Across Multi-device Environments** [c.7, p.5]
  Led research on federated learning (FL) in multi-device environments (MDEs). Proposed a user-centered FL training approach to counter statistical and system heterogeneity in MDE through user-centered FL training utilizing the time-alignment, model personalization, and accuracy- and efficiency-aware device selection.

KAIST Networking and Mobile Systems Lab (NMSL), Daejeon, South Korea *Mar. 2017 - Apr. 2021*
Graduate Student
Advisor: Sung-Ju Lee. Research on context-aware interventions for positive behavior change:

- **Modeling Behaviors of Regretful Smartphone Use with App Feature Use Analysis** [c.4]
  Led the design and implementation of an Android-based technology probe that tracks the usage of social media app features and samples in-situ level of regret after use. Designed and conducted a one-week field study and mixed-methods analysis.
- **Designing Context-Aware Micro-Interventions for Stress Management** [c.1, c.5]
  Designed and implemented an intervention mechanism for stress management that suggests micro-tasks for stress relief in micro spare time detected through mobile sensing.
- **Private Status Sharing and Sender-Controlled Notifications in Mobile Instant Messaging** [c.3, p.3, p.4]
  Led the design and implementation of private status sharing and sender-controlled notifications to function on commodity messaging apps. Designed and performed a two-week field study and mixed-methods analysis.

- **Vibroacoustic-based Object Recognition with Commodity Smartphones** [c.2, p.1, p.2]
  Designed and implemented 21 applications of knock-based interaction that leverage surrounding objects as contextual information. Modified the system to enable on-device training and inference of the SVM model. Assisted the design of the object recognition method, evaluation design, and user study operation.

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

Special Recognitions for Outstanding Reviews *2020-2022*
ACM CHI 2022, ACM CSCW 2021, ACM CSCW 2020

Best Paper Award *2021*
ACM CSCW 2021 [c.4]

Methods Recognition *2021*
ACM CSCW 2021 [c.4]

Bell Labs Summer Intern Award for Outstanding Innovation *2021*
Nokia Bell Labs Global Intern Program 2021

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

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

2nd Place, 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 CHI Reviewer *2022, 2023*

ACM UIST Reviewer *2022*

ACM CSCW Reviewer *2020, 2021*

ACM MobileHCI Reviewer *2021*

PRESENCE: Virtual and Augmented Reality Reviewer *2022*

IJHCI (International Journal of Human-Computer Interaction) Reviewer *2022*

ACM Computing Surveys Reviewer *2020*

ACM SIGGRAPH Poster Reviewer *2022*

ACM CHI Late Breaking Work Reviewer *2021*

ACM UIST Student Volunteer *2021*

ACM MobiSys Student Volunteer *2019*

TEACHING EXPERIENCE

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)

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

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

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

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

INVITED TALKS

Vibroacoustic-based Object Recognition with Smartphones
2019 IAT (Information Accessibility Technology) Conference Nov. 22, 2019

SELECTED PRESS

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*