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RESEARCH INTERESTS

On-device artificial intelligence

As mobile applications increasingly employ deep neural networks (DNNs), efficient and accurate execution on resource-constrained mobile devices has become critical. My research focuses on enabling such efficiency across various DNN tasks on mobile platforms, including vision foundation models for AR [c8], super-resolution for omnidirectional video streaming [c6], vision transformers, and real-time gaze tracking [c3].

Energy-aware mobile systems

Reducing energy consumption has consistently been a crucial concern for mobile devices. I have researched energy optimization for native [c1], web [c2], and game applications [j1] on smartphones. I am also interested in energy-efficient on-device AI techniques and AI-based energy optimization strategies [c2].

Mobile immersive computing

Immersive videos, such as omnidirectional and volumetric videos, can provide interactive and engaging experiences on mobile devices, but their large data sizes and computational demands pose significant technical challenges. I have explored techniques to maximize video quality under time and resource constraints, such as adaptive super-resolution for live 360-degree videos [c6] and 3DGS-based volumetric video streaming.

Cross-device computing

As users increasingly interact with multiple personal devices, cross-device computing has garnered interest. However, prior approaches often suffer from platform dependency. My research explores platform-agnostic methods for I/O sharing and interface distribution by leveraging the meta-platform characteristics of the web. I have analyzed user experience on the mobile web [c4] and proposed cross-device web computing techniques [c5, c7].

EXPERIENCES

Postdoctoral Researcher

Virginia Tech, VA, USA

Sep. 2025 (*Expected*) –

Supervisors:

- Prof. Lingjia Liu (Department of Electrical and Computer Engineering)
- Prof. Bo Ji (Department of Computer Science)

EDUCATION

Ph.D. in Computer Science and Engineering

Mar. 2018 – Aug. 2025 (Expected)

Yonsei University, Seoul, Republic of Korea

- Advisor: Prof. Hojung Cha (Mobile Embedded Systems Lab.)
- Thesis: Providing Resource-Optimized User Experiences in Networked Mobile Systems

B.S in Computer Science and Engineering

Mar. 2014 – Feb. 2018

Yonsei University, Seoul, Republic of Korea

PUBLICATIONS (PEER-REVIEWED)

'BK21 IF' refers to the IF listed for top CS conferences by the National Research Foundation of Korea.

* Co-primary authors

Conference Papers

[c8] “ARIA: Optimizing Vision Foundation Model Inference on Heterogeneous Mobile Processors for Augmented Reality”

Chanyoung Jung*, Jeho Lee*, Gunjoong Kim, Jiwon Kim, [Seonghoon Park](#), and Hojung Cha

The 23rd Annual International Conference on Mobile Systems, Applications and Services ([MobiSys '25](#))

June 23–27, 2025. Anaheim, California, US. ACM.

(Acceptance rate: 18.0%; BK21 IF: 3; Top conference in mobile computing)

[c7] “Vulture: Cross-Device Web Experience with Fine-Grained Graphical User Interface Distribution”

[Seonghoon Park](#), Jeho Lee, Yonghun Choi, and Hojung Cha

IEEE INFOCOM 2024 – IEEE Conference on Computer Communications ([INFOCOM '24](#))

May 20–23, 2024. Vancouver, Canada. IEEE.

(Acceptance rate: 19.6%; BK21 IF: 4; Top conference in computer networks)

[c6] “OmniLive: Super-Resolution Enhanced 360° Video Live Streaming for Mobile Devices”

[Seonghoon Park](#)*, Yeonwoo Cho*, Hyungchol Jun, Jeho Lee, and Hojung Cha

The 21st Annual International Conference on Mobile Systems, Applications and Services ([MobiSys '23](#))

June 18–22, 2023. Helsinki, Finland. ACM.

(Acceptance rate: 20.7%; BK21 IF: 3; Top conference in mobile computing)

[c5] “Crow API: Cross-device I/O Sharing in Web Applications”

[Seonghoon Park](#), Jeho Lee, and Hojung Cha

IEEE INFOCOM 2023 – IEEE Conference on Computer Communications ([INFOCOM '23](#))

May 17–20, 2023. New York, NY, USA. IEEE.

(Acceptance rate: 19.2%; BK21 IF: 4; Top conference in computer networks)

[c4] “WebMythBusters: An In-depth Study of Mobile Web Experience”

[Seonghoon Park](#), Yonghun Choi, and Hojung Cha

IEEE INFOCOM 2021 – IEEE Conference on Computer Communications ([INFOCOM '21](#))

May 10–13, 2021. Virtual Conference. IEEE.

(Acceptance rate: 19.7%; BK21 IF: 4; Top conference in computer networks)

[c3] “GAZEL: Runtime Gaze Tracking for Smartphones”

Joonbeom Park, [Seonghoon Park](#), and Hojung Cha

The 19th International Conference on Pervasive Computing and Communications ([PerCom '21](#))

March 22–26, 2021. Virtual Conference. IEEE.

(Acceptance rate: 10.6% for full papers; BK21 IF: 3)

[c2] “Optimizing Energy Efficiency of Browsers in Energy-Aware Scheduling-enabled Mobile Devices”

Yonghun Choi, [Seonghoon Park](#), and Hojung Cha

The 25th Annual International Conference on Mobile Computing and Networking ([MobiCom '19](#))

October 21–25, 2019. Los Cabos, Mexico. ACM.

(Acceptance rate: 19.0%; BK21 IF: 4; Top conference in mobile computing)

[c1] “Graphics-aware Power Governing for Mobile Devices”

Yonghun Choi, [Seonghoon Park](#), and Hojung Cha

The 17th Annual International Conference on Mobile Systems, Applications, and Services ([MobiSys '19](#))

June 17–21, 2019. Seoul, South Korea. ACM.

(Acceptance rate: 22.7%; BK21 IF: 3; Top conference in mobile computing)

Journal Papers

[j1] “Optimizing Energy Consumption of Mobile Games”

Yonghun Choi, [Seonghoon Park](#), Seunghyeok Jeon, and Hojung Cha

IEEE Transactions on Mobile Computing, Vol. 21, Issue 10, Oct. 2022, pp 3744–3756.

(JCR 2023 IF: 7.7; Top 5% journal in Computer Science, Information Systems)

Under Review/Revision

[u8] “Anonymized Paper (Energy efficiency)”

[First author](#)

Under Review (Conference)

[u7] “Anonymized Paper (Mobile immersive computing, Energy efficiency)”

[First author](#)

Under Review (Conference)

[u6] “Anonymized Paper (Mobile immersive computing)”

[First author](#)

Under Review (Conference)

[u5] “Anonymized Paper (Energy efficiency, On-device AI)”

[First author](#)

Under Review (Journal)

[u4] “Anonymized Paper (Mobile immersive computing)”

[Co-first author](#)

Under Review

[u3] “Anonymized Paper (Sensor management, Mobile immersive computing)”

[Co-first author](#)

Under Review

[u2] “Anonymized Paper (Assistive web interaction)”

Co-author

Under Review

[u1] “Anonymized Paper (On-device AI)”

Co-author

Under Review

ORAL PRESENTATIONS

- Vulture: Cross-Device Web Experience with Fine-Grained Graphical User Interface Distribution
Main Technical Session C-11 at IEEE INFOCOM 2024—Vancouver, Canada *May. 23, 2024*
- OmniLive: Super-Resolution Enhanced 360° Video Live Streaming for Mobile Devices
Main Conference Session 7 at ACM MobiSys 2023—Helsinki, Finland *Jun. 21, 2023*
- Crow API: Cross-device I/O Sharing in Web Applications
Main Technical Session E-8 at IEEE INFOCOM 2023—New York, NY, USA *May. 19, 2023*
- WebMythBusters: An In-depth Study of Mobile Web Experience (*Invited*)
Top Conference Session I at Korea Software Congress 2021—Pyeongchang, Republic of Korea *Dec. 21, 2021*
- WebMythBusters: An In-depth Study of Mobile Web Experience
Main Technical Session F-9 at INFOCOM '21—Virtual Conference *May. 13, 2021*

PATENTS

- [p3] “I/O Sharing Device and Method”
[Seonghoon Park](#), Jeho Lee, and Hojung Cha
Registration Decision Received
Patent Application No. 10-2023-0111882 (Republic of Korea; filed Aug. 25, 2023)
- [p2] “Method for Omnidirectional 3D Object Detection, Program Performing the Method, and Computing Device Executing the Program”
Jeho Lee, Chanyoung Jung, [Seonghoon Park](#), Hyungchol Jun, and Hojung Cha
Patent Pending, Patent Application No. 10-2024-0120347 (Republic of Korea; filed Sep. 04, 2024)
- [p1] “System and Operating Method for Cross-Device Experiences using In-Browser Virtual Proxy”
[Seonghoon Park](#), Jeho Lee, and Hojung Cha
Patent Pending, Patent Application No. 10-2024-0112156 (Republic of Korea; filed Aug. 21, 2024)

RESEARCH PROJECTS

- Development of AI-powered Real-time Cross-device 360-degree Video Sharing Technique
RS-2024-00412632, NRF, Republic of Korea *Sep. 2024 – Present*
- Development of On-device DNN Inference System for Real-time 3D Perception with Mobile 360-degree Camera
RS-2024-00344323, NRF, Republic of Korea *May. 2024 – Present*
- Development of High-Assurance (\geq EAL6) Secure Microkernel
RS-2018-II180532, IITP, Republic of Korea *Apr. 2018 – Present*
- Task Relation Graph Prediction based on RNN
Samsung Electronics, Republic of Korea *Mar. 2023 – Feb. 2024*

Development of Energy Management Techniques for Batteryless IoT System

2019R1A2C200461913, NRF, Republic of Korea

Mar. 2019 – Feb. 2022

Highly Flexible Device Profiling and Analysis System for Web Experiences Measurement

2017M3C4A708367723, NRF, Republic of Korea

Nov. 2017 – Dec. 2020

System Software for Mobile Device Power Management to Improve Available Time by 30%

Samsung Science & Technology Foundation, Samsung Electronics, Republic of Korea

Jan. 2017 – Aug. 2018

ACADEMIC SERVICES

Peer Reviewer

- IEEE Transactions on Mobile Computing (TMC): 2023, 2024

TEACHING EXPERIENCES

System Programming (CSI 3107)

Teaching Assistant—Yonsei University, Seoul, Republic of Korea

Fall 2024, Fall 2020, Fall 2019, Fall 2018

Operating Systems (CSI3101)

Teaching Assistant—Yonsei University, Seoul, Republic of Korea

Spring 2020, Spring 2019, Spring 2018

AWARDS AND HONORS

Ph.D. Fellowship

National Research Foundation of Korea (NRF), Republic of Korea

Sep. 2024 – Aug. 2025

Honors

Department of Computer Science,

Yonsei University, Seoul, Republic of Korea

2017 Fall, 2017 Spring, 2014 Fall, 2014 Spring

TECHNICAL SKILLS

Language

- Korean (Native)
- English

Programming Skills

- Machine learning frameworks (PyTorch, TensorFlow, TensorFlow Lite)
- Android applications
- Operating systems (Android kernel, Android framework, ChibiOS/RT microkernel)
- Web programming (Web applications with Node.js, Flask, etc.; Web extensions)