Park, Seonghoon

Ph.D. Candidate, Mobile Embedded System Lab., Department of Computer Science, Yonsei University
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Research Interests

Immersive mobile 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, including adaptive on-device super-resolution for live 360-degree videos [c6].

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 super-resolution [c6], real-time gaze tracking [c3], and others.

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.

Education

Yonsei University—Seoul, Republic of Korea *Mar. 2018 – Aug. 2025 (Expected)*
Ph.D. Candidate in Computer Science and Engineering
Mobile Embedded Systems Lab., supervised by Prof. Hojung Cha

Yonsei University—Seoul, Republic of Korea *Mar. 2014 – Feb. 2018*
B.S in Computer Science

PUBLICATIONS (PEER-REVIEWED)

* Co-primary authors

Conference Papers

NRF denotes the top CS conference list from National Research Foundation of Korea.

[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 (NRF IF: 4; Acceptance rate: 19.6%)

[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 (NRF IF: 3; Acceptance rate: 20.7%)

[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 (NRF IF: 4; Acceptance rate: 19.2%)

[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 (NRF IF: 4; Acceptance rate: 19.7%)

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

[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 (NRF IF:4; Acceptance rate: 19.0%)

[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 (NRF IF:3; Acceptance rate: 22.7%)

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 2022 IF: 7.9)

Under Review/Revision

[u10] “Anonymized Paper (Immersive mobile computing)”
Co-first author
Under Review

[u9] “Anonymized Paper (Immersive mobile computing, Energy efficiency)”
First author
Under Review

[u8] “Anonymized Paper (Energy efficiency)”
First author
Under Review

[u7] “Anonymized Paper (On-device AI, Immersive mobile computing)”
First author
Under Review

[u6] “Anonymized Paper (On-device AI, Energy efficiency)”
First author
Under Revision

[u5] “Anonymized Paper (On-device AI)”
Co-author
Conditionally Accepted to MobiSys 2025

[u4] “Anonymized Paper (On-device AI)”
Co-author
Under Review

[u3] “Anonymized Paper (On-device AI, Immersive mobile computing)”
Co-author
Under Revision

[u2] “Photovoltaic Energy-Harvesting Sensor Management using AR-assisted Digital Twin”
Daeyong Kim, Seonghoon Park, Rhan Ha, and Hojung Cha
Under Review at IEEE Transactions on Mobile Computing

[u1] “MAUI: Enhancing Assistive Web Interaction through GUI Abstraction”
Jeho Lee, Seonghoon Park, Yoonha Cha, and Hojung Cha
Under Review at IEEE Transactions on Human Machine Systems

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*

Research Projects

Development of AI-powered Real-time Cross-device 360-degree Video Sharing Technique
National Research Foundation of Korea (NRF), Republic of Korea *Sep. 2024 – Present*

Development of On-device DNN Inference System for Real-time 3D Perception with Mobile 360-degree Camera
National Research Foundation of Korea (NRF), Republic of Korea *May. 2024 – Present*

Development of High-Assurance (≥EAL6) Secure Microkernel
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
National Research Foundation of Korea (NRF), Republic of Korea *Mar. 2019 – Feb. 2022*

Highly Flexible Device Profiling and Analysis System for Web Experiences Measurement
National Research Foundation of Korea (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*

System Programming (CSI 3107)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *Fall, 2020*

Operating Systems (CSI3101)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *Spring, 2020*

System Programming (CSI 3107)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *Fall, 2019*

Operating Systems (CSI3101)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *Spring, 2019*

System Programming (CSI 3107)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *Fall, 2018*

Operating Systems (CSI3101)
Teaching Assistant—Yonsei University, Seoul, Republic of Korea *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 *Fall, 2017*

Honors
Department of Computer Science, Yonsei University, Seoul, Republic of Korea *Spring, 2017*

Honors
Department of Computer Science, Yonsei University, Seoul, Republic of Korea *Fall, 2014*

Honors
Department of Computer Science, Yonsei University, Seoul, Republic of Korea *Spring, 2014*

Technical Skills

Language

- Korean (Native)
- English

Programming Skills

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