Park, Seonghoon

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Research Interests

Cross-device computing

With the growing prevalence of multiple personal computing devices, cross-device computing has garnered significant attention. However, existing techniques often face challenges related to platform dependency. My research has addressed this issue by leveraging the meta-platform characteristics in web applications [c5, c7].

On-device machine learning

As mobile applications increasingly utilize deep neural network (DNN) models, efficient and accurate execution of the models becomes crucial. My research has specifically focused on super-resolution techniques for mobile 360-degree video streaming using multi-exit neural networks [c6] and real-time gaze tracking on mobile devices [c3].

Energy-aware mobile systems

Reducing energy consumption has consistently been a crucial concern for mobile devices. I have participated in research on energy optimization for native [c1], web [c2], and game applications [j1] on smartphones. Additionally, I am interested in energy-aware on-device machine learning and machine learning-based energy optimization strategies.

Education

Yonsei University—Seoul, Republic of Korea *Mar. 2018 – Present*
Ph.D. Candidate in Computer Science (Expected Graduation: August 2025)
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

Under Review/Revision

[u2] "Anonymized Paper"
Seonghoon Park, Jiwon Kim, Jonglae Park, and Hojung Cha
Under Review

[u1] "MAUI: Model-driven Development Tool for Usability-enhanced Web Interaction Techniques"
Jeho Lee, Seonghoon Park, Yoonha Cha, and Hojung Cha
Under Revision

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)

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
Institute for Information &communications Technology Promotion (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, 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

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
- Web frameworks and web applications
  - Chromium project
  - Node.js, Flask, Web extensions
- Android applications
- Operating systems
  - Android kernel, Android framework
  - ChibiOS/RT microkernel