Youngwook Son

Ph.D., Postdoctoral Researcher, University of Colorado Boulder.

CONTACT INFORMATION

Internet Systems Laboratory (ISL) and the Department of Computer Science, University of Colorado Boulder
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RESEARCH INTERESTS

Wireless networks & IoT connectivity

IEEE 802.11 PHY/MAC, next generation WLANs (Wi-Fi 8), IoT (classic BT, BLE, Zigbee, UWB, sensor, etc.), 5G/6G cellular and heterogeneous wireless networks

Communication system design

Digital front end & baseband signal processing, cross-layer framework, Multi-RAT, mmWave communications

Mobile intelligence and future wireless applications

Integrated sensing and communication (ISAC), Intelligent network & IoT convergence, Wireless support for mobile applications (VR, AR, MR, etc.)

EXPERIENCES

Postdoc, University of Colorado Boulder, Boulder CO, United States
Dec. 2025 – Present

Postdoc, Seoul National University, Seoul, South Korea
Feb. 2024 – Present

System Engineer, Samsung Electronics Co., Ltd., Gyeonggi-do, South Korea
Sep. 2020 – Jan. 2024

- Digital front-end & baseband modem design/verification for Wi-Fi SoC
- IEEE 802.11 PHY/MAC standardization

Internship, Soundlly, INC., Seoul, South Korea
Jan. 2013 – June 2013

EDUCATION

Seoul National University, Seoul, Korea

Combined M.S./Ph.D., Department of Electrical and Computer Engineering
(Sep. 2013 to Aug. 2020)

- Thesis: PHY/MAC Layer Strategies for High-Efficiency Dense WLANs
- Adviser: Prof. Saewoong Bahk and Sunghyun Choi (currently Corporate EVP, Samsung Networks)
- GPA: 3.70/4.30

B.S., Major in Electrical and Computer Engineering, Minor in Economics
(Mar. 2009 to Aug. 2013)

- GPA: 3.64/4.30 (total), 3.75/4.30 (major courses only), 3.84/4.30 (minor courses only)
- Graduated cum laude with B.S. Major in Electrical and Computer Engineering

CONFERENCE PUBLICATIONS

(* indicates corresponding author(s))
(† indicates co-first author(s))

[C1] Youngmin Kim, Kanghyun Lee, **Youngwook Son**, and Saewoong Bahk
"HactiFi: Towards Practical ISAC for Human Activity Recognition via Smart TV Infrastructure," in *Proc. IEEE VTC 2025-Fall*, Chengdu, China, Oct. 19–22, 2025.

[C2] Kanghyun Lee, **Youngwook Son***, Jongyeon Park, and Saewoong Bahk*
"Enriching Multi-User OFDMA in Wi-Fi Networks with Frequency-Selective Channel Awareness," in *Proc. IEEE INFOCOM 2025*, London, United Kingdom, May 19–22, 2025. (Acceptance rate: 18.7% = 272/1458)

[C3] **Youngwook Son**, and Saewoong Bahk*
"Revisiting Wi-Fi Performance under the Impact of Corrupted Channel State Information,"
in *Proc. ACM MSWiM 2020*, Online (due to COVID-19 pandemic), Nov. 16–20, 2020. (Acceptance rate: 25% = 24/96, Best paper runner-up)

[C4] **Youngwook Son**, Kanghyun Lee, Seongwon Kim, Jinmyeong Lee, Sunghyun Choi, and Saewoong Bahk*
"REFRAIN: Promoting Valid Transmission in High-Density Modern Wi-Fi Networks,"
in *Proc. ACM MobiHoc 2020*, Online (due to COVID-19 pandemic), Oct. 11–13, 2020. (Acceptance rate: 15.3% = 30/196)

[C5] Hwijae Kwon, Seongwon Kim, **Youngwook Son**, Changmok Yang, Seongho Byeon, and Sunghyun Choi,
"AWARE: Adaptive Wi-Fi Power Save Operation Coexisting with LTE-U,"
in *Proc. IEEE MASS 2019*, Monterey, CA, USA, Nov. 4–7, 2019.

[C6] Seongwon Kim, **Youngwook Son**, Kanghyun Lee, Jaehong Yi, and Sunghyun Choi,
"Quiet CTS: CTS Power Control for Better Spatial Reuse in Wi-Fi,"
in *Proc. ACM MobiHoc 2019*, Catania, Italy, July 2–5, 2019. (Acceptance rate: 23.71% = 37/156)

[C7] Seongho Byeon, Hwijae Kwon, **Youngwook Son**, Changmok Yang, and Sunghyun Choi,
"RECONN: Receiver-Driven Operating Channel Width Adaptation in IEEE 802.11ac WLANs,"
in *Proc. IEEE INFOCOM 2018*, Honolulu, Hawaii, USA, Apr. 15–19, 2018. (Acceptance rate: 19.2% = 309/1606)

[C8] Seongwon Kim, Jaehong Yi, **Youngwook Son**, Seungmin Yoo, and Sunghyun Choi,
"Quiet ACK: ACK Transmit Power Control in IEEE 802.11 WLANs,"
in *Proc. IEEE INFOCOM 2017*, Atlanta, GA, USA, May 1–4, 2017. (Acceptance rate: 20.93% = 292/1395)

[C9] Seungmin Yoo, Seongwon Kim, **Youngwook Son**, Jaehong Yi, and Sunghyun Choi,
"Practical Antenna Selection for WLAN AP,"
in *Proc. IEEE INFOCOM 2016*, San Francisco, CA, USA, Apr. 10–15, 2016. (Acceptance rate: 18.25% = 300/1644)

JOURNAL PUBLICATIONS

(* indicates corresponding author(s))

(= indicates co-first author(s))

[J1] Jihwan Lee, **Youngwook Son***, Tiago Koketsu Rodrigues, Yishi Zhu, Chulyoung Kwak, and Saewoong Bahk,
"TouchAI: Toward Waterproof Mobile Touchscreen Interface via Acoustic-Inertial Sensing Modalities," to appear in *IEEE Internet of Things Journal*, 2025.

[J2] **Youngwook Son** and Saewoong Bahk*,
"Bringing Spatial Reuse into Practice for Distributed Wi-Fi Networks: Preamble Detection and Anomalies," *IEEE Journal on Selected Areas in Communications*, vol. 43, no. 11, pp. 3616–3632, Nov. 2025.

[J3] **Youngwook Son***, Hyunbae Jeon, and Joonsuk Kim,
"Tackling the Coupled Frequency Offset Impairments for IEEE 802.11be Wideband WLANs,"
IEEE Transactions on Wireless Communications, vol. 25, pp. 865–882, July 2025.

[J4] Kanghyun Lee, Juhun Shin, Jongyeon Park, **Youngwook Son***, and Saewoong Bahk*,
"Recovering CSI and Data in Dense Network Environments using IEEE 802.11ax Midamble,"
IEEE Access, vol. 11, pp. 65858–65871, June 2023.

[J5] **Youngwook Son**, Seongwon Kim*, Seongho Byeon, and Sunghyun Choi*,
"Symbol Timing Synchronization for Uplink Multi-User Transmission in IEEE 802.11ax WLAN," *IEEE Access*, pp. 72962–72977, Nov. 2018.

[J6] Seongwon Kim, Seungmin Yoo, Jaehong Yi, **Youngwook Son**, and Sunghyun Choi*, "FACT: Fine-Grained Adaptation of Carrier Sense Threshold in IEEE 802.11 WLANs," *IEEE Transactions on Vehicular Technology*, vol. 66, no. 2, pp. 1886–1891, Feb. 2017.

[J7] Seungmin Yoo, Seongwon Kim, Jaehong Yi, **Youngwook Son**, and Sunghyun Choi*, "ProCCA: Protective Clear Channel Assessment in IEEE 802.11 WLANs," *IEEE Communications Letters*, vol. 20, no. 5, pp. 958–961, May 2016.

PATENTS (Granted U.S. patents only)

[P1] **Youngwook Son**, Seongwon Kim, Kanghyun Lee, Jonghoon Han, and Sunghyun Choi "Wireless communication devices for transmitting data using spatial reuse and data communication methods using the same," U.S. Patent 11381366B2, July. 5, 2022.

[P2] Seongwon Kim, Seungmin Yoo, **Youngwook Son**, Jaehong Yi, Sunghyun Choi, SangHyun Chang, Byounghoon Jung, and Sooyoung Jang "Method and apparatus for determining carrier sense threshold in wireless communication system," U.S. Patent 10602544B2, Mar. 24, 2020.

[P3] Seungmin Yoo, Seongwon Kim, **Youngwook Son**, Jaehong Yi, Sunghyun Choi, Youngjip Kim, Taejun Kim, Okhwan Lee, and Woonkyun Lee "Technique and apparatus for selecting multiple antennas," U.S. Patent 10348377B2, July 9, 2019.

[P4] **Youngwook Son**, Seungmin Yoo, Seongwon Kim, Jaehong Yi, Sunghyun Choi, SangHyun Chang, Byounghoon Jung, and Sooyoung Jang, "Method and apparatus for transmitting and receiving buffer status information in wireless communication system," U.S. Patent 10070341B2, Sep. 4, 2018.

RESEARCH PROJECTS

- National Research Foundation of Korea (NRF), "Implementation Framework for Seamless Integrated Sensing and Communication (ISAC) over Practical Wi-Fi Networks," Sep. 2025 to Aug. 2028.
- Institute for Information and Communications Technology Promotion (IITP), "Development of wireless LAN platform with smart cloud based multi radio structure," July 2018 to Aug. 2020.
- Samsung Electronics, "Extensions of optimal spatial reuse algorithm based on next-generation IEEE 802.11ax standard considering practical use environments," July 2018 to June 2019.
- Samsung Electronics, "Implementation of optimal spatial reuse algorithm based on next-generation IEEE 802.11ax standard," July 2017 to June 2018.
- Samsung Electronics, "IoT heterogeneous connectivity and operation system," Sep. 2014 to Aug. 2015.
- Samsung Electronics, "Multiple antenna selection in office environments," Oct. 2013 to May 2014.

INVITED TALKS AND TUTORIALS

- Tutorial on "Generating Header and Application Modules in NS-3" at 2018 KICS Lectures on NS-3, Feb. 2018.
- Tutorial on "Generating Header and Application Modules in NS-3" at 2017 KICS Lectures on NS-3, Feb. 2017.
- Tutorial on "Structure Overview and Application of Wi-Fi Modules in NS-3" at 2016 KICS Lectures on NS-3, Aug. 2016.
- Tutorial on "Generating Header and Application Modules in NS-3" at 2016 KICS Lectures on NS-3, Feb. 2016.

- Tutorial on "Tracing System and Wired LAN in NS-3" at 2015 KICS Lectures on NS-3, Feb. 2015.

Professional Activities

Professional Services

- Paper Reviewer: ACM MobiCom, IEEE INFOCOM, IEEE WoWMoM, IEEE SECON, IEEE GLOBECOM, IEEE WCNC, *IEEE J. Select. Areas Commun.*, *IEEE Trans. Wireless Commun.*, *IEEE Trans. Mobile Comput.*, *IEEE/ACM Trans. Netw.*, *IEEE Wirel. Commun. Lett.*, etc.

Teaching Assistant

- Introduction to Data Communication Networks, Fall 2017.
- Wireless Networking, Spring 2016.
- Design of Network Protocols with Experiments, Fall 2014.

Awards

- **Paper Excellence Award** from SNU–Samsung DS SSSP scholarship, Aug. 2020.
- **Gold Prize** (1st prize in Communications & Network division) from Samsung HumanTech Paper Award, Feb. 2016.

Miscellaneous

- Post-Doc. Research Fellowship funded by National Research Foundation of Korea (NRF), Sep. 2025 to Aug. 2028.
- Industrial Scholarship from Samsung Electronics, Mar. 2017 to Aug. 2020.
- Graduate Student Scholarship from Korea Education For Advanced Studies (KFAS), Apr. 2014 to Feb. 2019.
- National Science and Technology Scholarship from Korea Student Aid Foundation (KOSAF), Mar. 2009 to Feb. 2013.

Skill & Expertise

Programming Languages and Frameworks:

- C, C++, MATLAB, Python, Java, UNIX shell scripting, Windows batch scripting

Prototyping Tools

- NI LabVIEW with Communications System Design Suite (CSDS)
- NI LabVIEW with 802.11 Application Framework
- Linux wireless drivers and Atheros device drivers/firmware

Simulation Tools:

- Network simulator 3 (ns-3)
- 802.11a/ac/ax/p PHY link-level simulator with IT++ library
- MATLAB Communications/DSP/WLAN Toolbox

Test, Data acquisition, and Measurement Tools

- Wireshark, AirPcap, Chanalyzer
- Iperf, IxChariot, tcpdump, hostapd
- PicoScenes, FeitCSI

Desktop Editing and Productivity:

- Vim, TEX (Overleaf, LATEX, BIBTEX), Git, Microsoft Office

Languages

Native in Korea, fluent in English:

- TEPS score 785/990 (expired)