

JinYi Yoon

Ph.D. in Computer Science and Engineering

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RESEARCH INTEREST

Edge Intelligence, Federated Learning, Distributed/Split Learning, Machine Learning-Driven Networked Systems, Indoor Localization, Network Security, Wireless Ad-Hoc Networks

EDUCATION

Ph.D. in Computer Science and Engineering **Mar 2019 – Feb 2022**

Ewha Womans University, Seoul, Republic of Korea

- Ph.D. dissertation (Advisor: Prof. HyungJune Lee) – *Outstanding Dissertation Award*
: Demystifying Architecture, Networking, and Security Towards Edge Intelligence in Wireless Networks

M.S. in Computer Science and Engineering **Mar 2017 – Feb 2019**

Ewha Womans University, Seoul, Republic of Korea

- M.S. thesis (Advisor: Prof. HyungJune Lee)
: Delay-Sensitive Data Delivery to Ad-Hoc Nodes Using UAVs

B.S. in Computer Science and Engineering **Mar 2013 – Feb 2017**

Ewha Womans University, Seoul, Republic of Korea

- GPA: 4.11 / 4.30 with *top honors*

PROFESSIONAL EXPERIENCE

Postdoctoral Associate **Feb 2024 – Current**

Virginia Tech, Blacksburg, VA, USA

Postdoctoral Researcher **Mar 2022 – Dec 2023**

Ewha Womans University, Seoul, Republic of Korea

ON-GOING RESEARCH

Edge Intelligence & Federated Learning

- Advising on survey of federated learning (*as an advisor*)
- *Keywords*: survey, federated learning, split learning, edge intelligence
- Guiding in personalized yet generalized federated learning with representation prototypes (*as an assistant advisor*)
- *Keywords*: personalized federated learning, generalized federated learning, representation prototype
- Have developed a framework to transfer customized collective intelligence federation
- *Keywords*: collective intelligence, customized knowledge federation, model aggregation, decentralized federated learning
- Have led research on continual federated learning for edge intelligence
- *Keywords*: continual federated learning, knowledge transfer, self-constructive/self-sustainable edge intelligence, lightweight AI

Indoor Localization

- Conducting research on explainable indoor localization (*as an assistant advisor*)
 - *Keywords*: explainable AI, deep learning-driven indoor localization
- Guiding in indoor localization with few-shot learning (*as an assistant advisor*)
 - *Keywords*: indoor localization, room classification, few-shot learning, prototypical networks
- Have worked on obstacle-aware indoor localization (*as an assistant advisor*)
 - *Keywords*: obstacle-aware map adaptation, chained map generation
- Have conducted a fingerprint-based map inference for indoor localization
 - *Keywords*: site survey-free indoor localization, generative radio map, RSSI fingerprints

Network Security

- Have participated in work on network intrusion detection system with few-shot learning (*as an assistant advisor*)
 - *Keywords*: network intrusion detection system (NIDS), prototypical networks

PUBLICATIONS

Under Review

- **JinYi Yoon** and HyungJune Lee, "-", *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2024.
- Yeawon You, Dayeon Kang, Jeewoon Kim, **JinYi Yoon**, and HyungJune Lee, "-", *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2024.
- **JinYi Yoon**, Yeawon You, Dayeon Kang, Jeewoon Kim, and HyungJune Lee, "-", *IEEE International Conference on Mobile Systems, Applications, and Services (MobiSys)*, 2024.
- **JinYi Yoon** and HyungJune Lee, "-", *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.

Conference Papers

- Yeawon You, **JinYi Yoon**, and HyungJune Lee, "Breakwater: Securing Federated Learning from Malicious Model Poisoning via Self-Debiasing," *IEEE International Conference on Communications (ICC)*, 2024.
- **JinYi Yoon**, Jeewoon Kim, Yeongsin Byeon, and HyungJune Lee, "VersatileFL: Volatility-Resilient Federated Learning in Wireless Edge Networks," *IEEE International Conference on Sensing, Communication, and Networking (SECON)*, 2023. (Acceptance Ratio: 43/182=23.6%)
- **JinYi Yoon** and HyungJune Lee, "PUFGAN: Embracing a Self-Adversarial Agent for Building a Defensible Edge Security Architecture," *IEEE International Conference on Computer Communications (INFOCOM)*, Jul 2020. (Acceptance Ratio: 268/1354=19.8%)
- Christina Suyong Shin, So-Yeon Park, **JinYi Yoon**, and HyungJune Lee, "Progressive Ad-Hoc Route Reconstruction Using Distributed UAV Relays after a Large-Scale Failure," *IEEE Wireless Communications and Networking Conference (WCNC)*, 2018.
- **JinYi Yoon**, YeonJin Jin, Narangerelt Batsoyol, and HyungJune Lee, "Adaptive Path Planning of UAVs for Delivering Delay-Sensitive Information to Ad-hoc Nodes," *IEEE Wireless Communications and Networking Conference (WCNC)*, 2017.

Journals

- **JinYi Yoon**, Yeongsin Byeon, Jeewoon Kim, and HyungJune Lee, "EdgePipe: Tailoring Pipeline Parallelism with Deep Neural Networks for Volatile Wireless Edge Devices," *IEEE Internet of Things Journal (IoT-J)*, Vol. 9, no. 14, pp. 11633-11647, Jul 2022.
- **JinYi Yoon**, JiHo Lee, Nayoung Han, and HyungJune Lee, "A Survey on Parallel Deep Learning," *The Journal of the Korean Institute of Communications and Information Sciences (KICS)*, Vol. 46, No. 10, pp. 1604-1617, 2021. (in Korean)

- **JinYi Yoon**, Sungju Doh, Omprakash Gnawali, and HyungJune Lee, "Time-Dependent Ad-Hoc Routing Structure for Delivering Delay-Sensitive Data Using UAVs," *IEEE Access*, Vol. 8, pp. 36322-36336, 2020.
- JeiHee Cho, JaeYi Sung, **JinYi Yoon**, and HyungJune Lee, "Towards Persistent Surveillance and Reconnaissance Using a Connected Swarm of Multiple UAVs," *IEEE Access*, Vol. 8, pp. 157906-157917, 2020.
- **JinYi Yoon**, A-Hyun Lee, and HyungJune Lee, "Rendezvous: Opportunistic Data Delivery to Mobile Users by UAVs Through Target Trajectory Prediction," *IEEE Transactions on Vehicular Technology (TVT)*, Vol. 69, No. 2, pp. 2230-2245, Feb 2020. (IF=5.978, JCR 2020)
- **JinYi Yoon** and HyungJune Lee, "A Survey on Approximation Algorithms for Path Planning of UAVs," *The Journal of the Korean Institute of Communications and Information Sciences (KICS)*, Vol. 43, No. 1, pp. 161-167, 2018.
- **JinYi Yoon**, YeonJin Jin, So-Yeon Park, and HyungJune Lee, "Customized Evacuation Pathfinding through WSN-Based Monitoring in Fire Scenarios," *The Journal of the Korean Institute of Communications and Information Sciences (KICS)*, Vol. 41, No. 11, pp. 1661-1670, 2016. (in Korean)

Short Papers

- **JinYi Yoon**, Narangerelt Batsoyol, SungJu Doh, and HyungJune Lee, "A Survey on Path Planning Algorithms for UAVs in Wireless Ad-Hoc Networks under Time Constraints," *The Korean Institute of Communications and Information Science (KICS) Summer Conference*, pp. 1362-1363, 2017. (*Selected Paper*)
- YeonJin Jin, **JinYi Yoon**, So-Yeon Park, Batsoyol Narangerelt, and HyungJune Lee, "Customized Evacuation Path Finding by Predicting Variation of Temperature based on WSN in Fire Scenarios," *The Korean Institute of Communications and Information Science (KICS) Summer Conference*, pp. 634-635, 2016. (*Selected Paper*, in Korean)
- YeonJin Jin, **JinYi Yoon**, So-Yeon Park, and HyungJune Lee, "Multi-level Clustering for Real-Time Fire Monitoring and Prediction Based on WSN," *The Korean Institute of Communications and Information Science (KICS) Fall Conference*, pp. 54-55, 2015. (**Undergraduate Best Paper Award**, in Korean)

PATENTS

- "Prediction Method for Vulnerability in Security System Based on PPUF Analysis Apparatus," Korea Patent 1024052080000, filed July 06, 2020, issued May 30, 2022. (with HyungJune Lee)
- "Surveillance Method for Region of Interest using Swarm of Multiple UAVs," Korea Patent 1023366370000, filed November 23, 2020, issued December 02, 2021. (with HyungJune Lee, JaeYi Sung, and JeiHee Cho)
- "Data Delivery of Unmanned Aerial Vehicle Based on Target Node Trajectory Prediction," Korea Patent 1023068610000, filed July 08, 2020, issued September 23, 2021. (with HyungJune Lee and A-Hyun Lee)
- "Data Delivery Method of Unmanned Aerial Vehicle using Local Ad-hoc Network," Korea Patent 1023068590000, filed July 06, 2020, issued September 23, 2021. (with HyungJune Lee and Sungju Doh)
- "Progressive UAV Deployment Method for Relay Node," Korea Patent 1019881680000, filed April 13, 2018, issued June 04, 2019. (with HyungJune Lee, So-Yeon Park, and Christina Suyong Shin)
- "Path Planning Decision Method for Unmanned Aerial Vehicles," Korea Patent 1020090800000, filed July 21, 2017, issued August 02, 2019. (with HyungJune Lee, YeonJin Jin, and Narangerelt Batsoyol)

HONORS & AWARDS

- Virginia Tech Presidential Postdoctoral Fellowships 2024 – 2025
- Outstanding Dissertation Award Feb 2022
- *Solvay* Scholarship (full tuition and research grants) Spring 2020 – Fall 2021

- Ewha Graduate Research Fellowship (for research excellence) Fall 2019
- Admissions Scholarship (full tuition) Spring 2019 – Fall 2019
- *Lee, Gi-Ho* Scholarship (for admission with academic excellence) Spring 2019
- Student Assistant Scholarship Spring 2018 – Fall 2018
- Korea National Technical Qualification of Engineer Information Processing Aug 2018
- Admissions Scholarship (full tuition) Spring 2017 – Fall 2017
- Graduation with Academic Excellence Feb 2017
- Honorable Mention, ACM International Collegiate Programming Contest Nov 2016
- Silver Prize, Engineering Education Student Portfolio Contest Sep 2016
Korea University Innovation (Hub) Center
- Ewha Scholarship for the Future Design Fall 2015 – Spring 2016
- Honors Scholarship for Best GPA in Major (for academic excellence) Spring 2016
- 121st Place, Google Code Jam to I/O for Women Mar 2016
- Undergraduate Best Paper Awards, Fall Conference Nov 2015
The Korean Institute of Communications and Information Science (KICS)
- Honors Scholarship (for academic excellence) Fall 2013 – Fall 2015
- Dean’s List Spring 2013 – Fall 2015
- 24th Place in ACM-ICPC, KAIST, Daejeon, Asia Nov 2015
- The Finals, K-Hackerthon 2015
- Grand Prize, Ewha Programming Contest May 2014

ACTIVITIES

- Invited talk for *Next-Generation AI Top Conference Session @ Korea Software Congress 2020* Dec 2020
- Mentor of Ewha *WE-UP* Senior Mentoring Program Fall 2021
WE-UP (Women in Engineering - Undergraduate Leading Program)
- Founder of the programming club, *Ewha DO Coding (EDOC)* Spring 2016 – Spring 2017
- Undergraduate researcher Dec 2014 – Feb 2017
Intelligent Networked Systems Lab, Ewha Womans University
- Google I/O, *Mountain View, CA, USA* 2016

Teaching Assistant

- Computer Architecture 2017 – 2018, 2020 – 2021
- Data Structure 2021
- Programming (C, Arduino in C, Python, or JAVA) 2016 – 2021
- Discrete Mathematics 2019 – 2021
- Automata and Formal Languages 2017 – 2018, 2020 – 2021
- Computer Networks 2018 – 2020
- Software-based Convergence System Design 2017, 2020
- Computer Engineering Project (Capstone Design) 2019
- Theory of Programming Language 2017

Last updated on Feb 20, 2024