

# JinYi Yoon

Ph.D. in Computer Science and Engineering

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## RESEARCH INTEREST

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Federated Learning, Edge Computing and Security, Distributed Learning, Machine Learning-Driven Networked Systems, Indoor Localization, Wireless Ad-Hoc Networks

## EDUCATION

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### Ph.D. in Computer Science and Engineering

Mar 2019 – Feb 2022

*Ewha Womans University, Seoul, Republic of Korea*

- GPA: 4.20 / 4.30
- 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*

- GPA: 4.30 / 4.30
- 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

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### Postdoctoral researcher

Mar 2022 – Current

*Intelligent Networked Systems Lab, Ewha Womans University*

## ON-GOING RESEARCH

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### Federated Learning

- Developed a framework to transfer customized collective intelligence in federated learning  
- *Keywords*: collective intelligence, customized knowledge federation, model aggregation
- Led research on continual federated learning for edge-oriented intelligence  
- *Keywords*: federated continual learning, selective knowledge transfer, edge intelligence, lightweight AI
- Guiding in personalized federated learning (*as an assistant advisor*)  
- *Keywords*: personalized federated learning, representation prototype

### Indoor Localization

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

## Network Security

- Instructing in poisoning attacks (*as an assistant advisor*)
  - *Keywords*: model poisoning attack, decentralized federated learning
- Participated in work on network intrusion detection system (NIDS) (*as an assistant advisor*)
  - *Keywords*: network intrusion detection system, prototypical networks

## PUBLICATIONS

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### Under Review

- **JinYi Yoon** and HyungJune Lee, "-", *IEEE International Conference on Computer Communications (INFOCOM)*, 2024.
- **JinYi Yoon** and HyungJune Lee, "-", *Conference on Neural Information Processing Systems (NeurIPS)*, 2023.
- **JinYi Yoon**, Yeawon You, Dayeon Kang, Jeewoon Kim, and HyungJune Lee, "-", *IEEE International Conference on Mobile Computing and Networking (MobiCom)*, 2024. (*to be submitted*)
- Jeihee Cho, **JinYi Yoon**, and HyungJune Lee, "-", *IEEE International Conference on Communications (ICC)*, 2024. (*to be submitted*)
- Yeawon You, Dayeon Kang, Jeewoon Kim, **JinYi Yoon**, and HyungJune Lee, "-", *USENIX Symposium on Networked Systems Design and Implementation (NSDI)*, 2024. (*to be submitted*)

### Conference Papers

- **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. (*to appear*)
- **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

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

### HONORS & AWARDS

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|---|-------------------------|
| • Outstanding Dissertation Award  | Feb 2022                |
| • <i>Solvay</i> 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 |
| • <i>Lee, Gi-Ho</i> 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 <i>Korea University Innovation (Hub) Center</i>	Sep 2016
• Ewha Scholarship for the Future Design	Fall 2015 – Spring 2016
• Honors Scholarship for Best GPA in Major (for academic excellence)	Spring 2016
• 121 <sup>st</sup> Place, Google Code Jam to I/O for Women	Mar 2016
• Undergraduate Best Paper Awards, Fall Conference <i>The Korean Institute of Communications and Information Science (KICS)</i>	Nov 2015
• Honors Scholarship (for academic excellence)	Fall 2013 – Fall 2015
• Dean’s List	Spring 2013 – Fall 2015
• 24 <sup>th</sup> Place in ACM-ICPC, KAIST, Daejeon, Asia	Nov 2015
• The Finals, K-Hackerthon	2015
• Grand Prize, Ewha Programming Contest	May 2014

## ADDITIONAL ACTIVITIES

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

## TECHNICAL SKILLS

<b>Proficient</b>	Python (with <i>TensorFlow</i> and <i>PyTorch</i> ), MATLAB, C, JAVA, L <sup>A</sup> T <sub>E</sub> X
<b>Intermediate</b>	Arduino, NesC, Assembly Language (MIPS), R
<b>Novice</b>	PHP, HTML, SQL, Android Programming (Kotlin), Prolog, Lisp

*Last updated on August 08, 2023*