Anna (Yoo Jeong) Ha

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RESEARCH INTERESTS

Security and Privacy; Robust AI; Machine Learning; Human-Computer Interface

EDUCATION

Korea University, Seoul, Republic of Korea Mar. 2021 – Fed. 2023
Master of Electrical and Computer Engineering

Korea University, Seoul, Republic of Korea Mar. 2017 - Feb. 2021
Bachelor of Mechanical Engineering

University of Chicago Sep. 2023 - Present
PhD Student, Computer Science
Advised by Prof. Ben Y. Zhao and Prof. Heather Zheng

PUBLICATIONS

J02. **Yoo Jeong Ha**, Gusang Lee, Minjae Yoo, Soyi Jung, Seehwan Yoo, and Joongheon Kim. *"Feasibility Study of Multi-Site Split Learning for Privacy-Preserving Medical Systems under Data Imbalance Constraints in COVID-19, X-Ray, and Cholesterol Dataset".* Nature Scientific Reports, 12:1534, January 2022. [pdf]
(IF: 4.996, Top 26.03% (19/73), in the category of MULTIDISCIPLINARY SCIENCES)

J01. **Yoo Jeong Ha**, Minjae Yoo, Gusang Lee, Soyi Jung, Sae Won Choi, Joongheon Kim, and Seehwan Yoo. *"Spatio-Temporal Split Learning for Privacy-Preserving Medical Platforms: Case Studies with COVID-19 CT, X-Ray, and Cholesterol Data".* IEEE Access, 9:121046-121059, September 2021. [pdf]
(IF: 3.476, Top 38.04% (105/276), in the category of ENGINEERING, ELECTRICAL & ELECTRONIC)

C05. Won Joon Yun, **Yoo Jeong Ha**, Soyi Jung, and Joongheon Kim. *"Autonomous Aerial Mobility Learning for Drone-Taxi Flight Control"*. IEEE ICTC (Jeju, Korea), October 2021. [pdf]

C04. Gusang Lee, Won Joon Yun, **Yoo Jeong Ha**, Soyi Jung, Jiyeon Kim, Sunghoon Hong, Joongheon Kim, and Youn Kyu Lee. *"Measurement Study of Real-Time Virtual Reality Contents Streaming over IEEE 802.11 ac Wireless Link".* MDPI Electronics, vol.10, no.16, pp.1967, 2021. [pdf]

C03. **Yoo Jeong Ha**, Minjae Yoo, Soohyun Park, Soyi Jung, and Joongheon Kim. *"Secure Aerial Surveillance using Split Learning"*. IEEE ICUFN (Jeju, Korea), August 2021. [pdf]

C02. Hankyul Baek, **Yoo Jeong Ha**, Soyi Jung, and Joongheon Kim. *"Noise Rejection in mmWave Radar Images using Deep Learning Image Processing Methods"*. ITC-CSCC (Jeju, Korea), June 2021. [pdf]

C01. Minjae Yoo, **Yoo Jeong Ha**, Soyi Jung, and Joongheon Kim. *"CNN-based Hand Gesture Recognition Using mmWave Radar"*. ITC-CSCC (Jeju, Korea), June 2021. [pdf]

AWARDS

Haedong Paper Award, 2021 KICS Summer Conference Jun. 2021

Capstone Design, Korea Institute for Advancement of Technology Jul. 2020
· Supervisor: Prof. Yong-nam Song
· Received for creating direct light dimmer using a face detection model trained with transfer learning.

Creative Integration Award, Korea Association of Robot industry Jan. 2020
· Received for creating a portable plant stand that automatically moves outdoors into the direct sunlight during the day and moves indoors during the night to avoid the cold.

Excellence Award, 2019 Makerspace Hackathon (KU) Jan. 2019
· Received for recreating the Harry Potter Leviosa spell by combining my knowledge of CAD, 3D printing, sensors (gyro and photoresistor), and an Arduino Nano board.

Long Tan Leadership and Teamwork Award, The Australian Defence Force Nov. 2016
· Received for demonstrating determination, mate-ship, teamwork, tenacity, compassion, and leadership.

PATENTS

Video Processing System and Video Processing Method Using Split Learning (IP-2022-0144-US), *waiting*

Control and Recording Medium for A Medical Data Split Learning System (KR2021/016408), *waiting US*

TEACHING ASSISTANT

College of Engineering - Department of Semiconductor Engineering Sep. 2021 – Feb. 2022

RESEARCH EXPERIENCE

Quantum Hyper-Driving: Quantum-Inspired Hyper-Connected and Hyper-Sensing Autonomous Mobility Technologies – NRF Mar. 2022 - Present

Research Assistant; Advisor: Prof. Joongheon Kim (Korea University)

· Research on ultra-dense vehicle network environment using quantum computing and build an autonomous driving system.

· Understanding network and security optimization for multimodal sensing based on quantum computing and quantum-based optimization algorithms to efficiently use large amounts of data.

Intelligent 6G Wireless Access System Research Center – IITP May 2021 - Present

Research Assistant; Advisor: Prof. Joongheon Kim (Korea University)

· Research on multi-item parallel autoencoder channel application and wireless cloud network operating system technology for ultra-low latency guaranteed distributed computing.

· Understanding a self-organizing 6G edge network concept optimizes edge/cloud distributed calculation strategies by developing a backhaul cooperative autoencoder for AI cooperation.

mmWave Radar and DRL based Optimal Policy Autonomous Driving – NRF Mar. 2021 - Feb.2022

Research Assistant; Advisor: Prof. Joongheon Kim (Korea University)

· Research on deep reinforcement learning algorithm (DDPG) for a mmWave radar embedded driving system to develop an optimal driving strategy.

· The DDPG-based learning module is independently made in each car to distribute the load such that the learned optimal driving policy can allow real-time autonomous driving.

Autonomous Intelligent COA Search Methods for Cyber-Attacks – ADD Dec. 2021 - Nov.2022

Research Assistant; Advisor: Prof. Joongheon Kim (Korea University)

· Research on autonomous intelligent cyber threat COA detection technology (DRL, hierarchical attack representation model) in a large-scale distributed military network environment.

Development of Privacy-reinforcing Distributed Transfer-Iterative Learning Algorithm - MHW

Research Assistant; Advisor: Prof. Joongheon Kim (Korea University) Jul. 2019 - Nov.2022

· Research on DisTIL, a distributed deep learning federated learning algorithm with enhanced personal information protection by utilizing three institutions' Common Data Model (CDM).

EXTRACURRICULAR ACTIVITIES

The Granite Tower, Korea University English Magazine Mar. 2017 - Jul. 2019

· Reporter and Editor-in-Chief (General Affairs)

Automobile Club, Mechanical Engineering, KU Mar. 2017 - Dec. 2020

· Mechanic (welding, grinding, milling, and processing parts of a baja vehicle)

Global Leadership Exchange, Korea University School of Engineering Aug.2019

· Representative of KU, where engineering students from Waseda, Korea, Yonsei, and Keio University gathered in Japan to discuss the importance of leadership in engineering.

KUECS: KU Engineering Community Service, Korea University Sep. 2019 – Sep. 2020

· District Leader; Led the group in teaching science/experiments to elementary school students.

SKILLS AND ADDITIONAL INFORMATION

Languages

· Native in Korean; Fluent in English (I grew up in Australia for 12 years)

Experimental Skills

· Python (Pytorch, Tensorflow, Matplotlib, Numpy, Pandas), Ardunio, Linux, MATLAB, Latex
· AutoCAD, CREO, NX, Solidworks, Adobe Illustrator
· Microsoft Word; especially in PowerPoint, Word, Excel
· Laser-cutter, Metal Work, Injection Molding, 3D Printer, CNC, Wood Work