Junyoung Hwang

jyh@gatech.edu • +1 470-815-8745 • Georgia Institute of Technology

RESEARCH INTERESTS

- 3D IC Designs
- VLSI Design and Computer Architecture
- In-memory & AI accelerator architecture design.
- Artificial Intelligence & IoT Integrated Device

EDUCATION

Georgia Institute of Technology   **Atlanta, Georgia**
Ph.D. in Electrical and Computer Engineering   Agu. 2023 - present

Korea University   **Seoul, South Korea**
Bachelor of Engineering in Electrical Engineering   Feb. 2023
GPA of 4.29/4.5 (Major GPA of 4.42/4.5)

Graduation Thesis: Stock Prediction with Multi Input LSTM

Korea University Fellowship Scholarship	1st Semester of 2022
Dean's List	1st Semester of 2019
President's List	2nd Semester of 2019
National Science & Technology Scholarship	2nd Semester of 2019
Semester High Honors	1st Semester of 2022, 1st and 2nd Semester of 2019
	1st, 2nd Semester of 2018, 2nd Semester of 2017
Top-honor Scholarships	1st Semester of 2018, 1st Semester of 2019

SKILLS

Programming Languages	MATLAB, Verilog, C, Python
Libraries	Tensorflow, Opencv, Qiskit
Verilog Hardware Design Software	Model Sim, Design Vision
Circuit Design Software	Cadence CAD tool-Virtuoso, Pspice, Hspice, PADS
Semiconductor Process Simulation Software	Silvaco-TCAD
Languages	English (Advanced), Korean (Native)

RESEARCH

GTCAD Lab   **Atlanta, Georgia**
Graduate Research Assistant   Agu. 2023 - present
- Advisor: Prof. Sung Kyu Lim
- Heterogeneous Monolithic/F2F 3D IC Design for Near-memory and In-memory ML Accelerators

Lab for Informatics, Communications and Systems   **Seoul, South Korea**
Intern (Undergraduate Researcher)   Mar. 2022 - Dec. 2022
- Designed Grover Search Algorithm circuit for solving K-sat problems
- Quantum Feature Mapping for Unsupervised Clustering with Quantum Approximate Optimization Algorithm
- Designed Quantum Circuit for solving weighted graph coloring problems

WORK EXPERIENCE

HANDS (Hardware and Software)   **Seoul, South Korea**
Honorary Member   Sep. 2017 - Jun. 2022
Major Association, Korea University
- Participated in projects using Arduino & Raspberrypi
- Participated as a Team Leader in Humanoid Projects

KUMEFOOD   **Seoul, South Korea**
CIO (Chief Information Officer)   Sep. 2021 - Dec. 2021 • Co-founder
- Production of the system for providing food manufacturing environmental monitoring service
- Research and development of object detection AI model using YOLO
- Applied for the patent of a food manufacturing environmental monitoring system

Part-Time Teacher   **Seoul, South Korea**
Taught physics as a tutor in an academy   Mar. 2017 - Jun. 2020

RELEVANT CLASS PROJECTS

- Designed & Layout Speaker driver circuit including Low Pass Filter using PADS tool; Amplifying the Input sounds and Filtering out the noise above 10 kHz frequency: Simulation by soldering, the output noise was well filtered without any noise
- Designed an area-efficient De-interleaver Hardware Architecture in Verilog; De-interleaving the Interleaved input data and optimizing the architecture by finding the patterns: Achieved twice the effective area and power consumption than the class average
- Designed an area & power efficient 2D-DCT in JPEG Image Compression Hardware in Verilog; Using Ping-Pong structure and optimizing Transpose Memory & 2D-DCT by removing high-frequency components of the images and using bit-truncation & symmetry of coefficient matrix: Selected as the best work by achieving the most area efficient module
- Designed MBIST, folded FIR filter, and 128bit Lightweight Encryption Algorithm (LEA) Decryption Implementation modules in Verilog during VLSI design and experiment lecture
- Designed 16bit Multiplier and 3-Tap FIR Filter: Synthesis, and Place & Route using Design Vision & Astro
- Designed Two Different Gate Length (280nm, 240nm) MOSFETs using the TCAD tool; Analyzed the device performances and parameters (Vth, ISAT, and DIBL): Studied and simulated semiconductor process
- Designed Artificial Intelligent Reversi/Othello board game as Graduation products; Control Dot-Matrix Board to express discs
- Developed calculate 3x3 inverse Matrix, heap sort program with Arm assembly language during Computer Architecture lecture
- Developed Multiple Access Chatting Program using Multithread during the Operating System lecture

ACTIVITIES

Creative Challenge Program   **Seoul, South Korea**
Member   Apr. 2018 - Feb.2019
- Implemented by Korea University's CTL support Team
- Create Pet-caring Robot based on Arduino and Raspberrypi with Opencv, Tensorflow

Creative Challenge Program   **Seoul, South Korea**
Team leader   Apr. 2019 - Feb.2020
- Create Delivering Robot based on GPS and camera with Opencv, Tensorflow

- Shortest Path Problem Algorithm for Navigation

World Embedded Software Contest 2018 in Humanoid Robot   **Seoul, South Korea**
Team leader   Apr. 2018-Dec.2018
- Control Humanoid Robot with Visual Basic (master), Opencv-python (slave)
- Solving Challenged Mission from DARPA Robotics Challenge

World Embedded Software Contest 2019 in Humanoid Robot   **Seoul, South Korea**
Team leader   Apr. 2019-Dec.2019
- Control Humanoid Robot with Visual Basic (master), Opencv-python (slave)
- Solving Challenged Mission from DARPA Robotics Challenge

Korea University Electrical Engineering Soccer Club   **Seoul, South Korea**
Member   Mar. 2017 - Dec. 2022

Quantum Hackathon Korea 2022   **Seoul, South Korea**
Member   Mar. 2017 - Dec. 2022
- Quantum Feature Mapping for Unsupervised Clustering
- Design Quantum gate for Grover Search Algorithm with Qiskit

AWARDS

Bronze Prize   **Seoul, South Korea**
Electrical Engineering Software Hackathon, Korea University   Dec. 2019
3rd Prize in Humanoid   **Seoul, South Korea**
The World Embedded Software Contest 2019   Dec. 2019
2nd Prize in Hardware Design   **Seoul, South Korea**
Graduation Products, Korea University   Jun. 2019

MILITARY SERVICE

Aviation Safety Agency, Republic of Korea Air Force   **Seoul, South Korea**
Honorable Discharge   April 2020- Jan. 2022