김형준 (Hyoungjoon "Paul" Kim)

Undergraduate at Electrical & Computer Engineering, Seoul National University

🏴 Republic of Korea   🏛 jsvn7777@snu.ac.kr   ✉ thekpaul000@gmail.com

 thekpaul   **in** @thekpaul

Education

From Mar. 2018

BS in Electrical & Computer Engineering, Seoul National University
Expected to graduate in Summer 2024
Areas of Interest: System Programming, Digital Systems Design, Deep Learning
Graduation Project: Optimising the CNN Architecture with Hardware Design

Experience

From Mar. 2023

FPGA Engineer Intern for **NeuroRealityVision**
Dongtan, Republic of Korea

- Firmware, software development for MIPI-to-Ethernet integration

- Bare-metal, standalone FPGA application with interrupt-based workflow

- Real-time Ethernet packet capture and image rendering software development

    - Kernel-level optimisations in threading and system calls for faster processing speed

    - Direct modifications to system and network settings

- Custom IP development with Verilog-based RTL on Vivado

**Jan. 2023
to Jun. 2023**

Student Intern for Dept. of System Semiconductor Engineering
Seoul National University, Seoul, Republic of Korea

- Worked on CNN Architecture and Hardware Design Optimisation

**Dec. 2019
to Jul. 2021**

KATUSA, Human Resources Specialist (42A)
94th Military Police Battalion, Pyeongtaek, Republic of Korea

- Mandatory military service as a KATUSA Agent
  (Korean Augmentation To the United States Army)

Skills

Engineering

- Experienced in system software engineering for Windows and Linux

- Experienced in embedded systems design on multi-purpose SoC FPGAs

- Capable of versatile development with C, C++ and Python

- Capable of maintaining HTML/CSS front-end projects

- Proficient in typesetting with LaTeX

Languages

- Korean: Native proficiency

- English: Fluent, professional working proficiency

Education

Bachelor's Degree: ECE, SNU

- Expected to graduate in Summer 2024

- **Graduation Project**: Optimising the CNN Architecture with Hardware Design

    - RTL development with Verilog

    - Pipelined, streaming CNN architecture concurrently running multiple convolution layers

    - Improved performance in faster speed and less memory usage without affecting end results

- **Areas of Interest**: System Programming, Digital Systems Design, Deep Learning

  Key Courses Taken:

    - Computer Organisation, Digital Systems Design: Basic RTL simulation and synthesis on FPGAs

    - Operating Systems: System calls, tasks, multithreading and scheduling on the Linux kernel

    - Other Computer-related Courses: Introduction to Data Structures, Introduction to Algorithms

Experience

FPGA Engineer Intern: NeuroRealityVision

- Firmware, software development for MIPI-to-Ethernet integration

    - Extract MIPI data from normal camera (CIS) and **event camera** (DVS) sensors to FPGA main memory

    - Experienced in hardware-firmware communication and interrupt handling mechanisms

        * **PS** (Processing System): Xilinx Gigabit Ethernet Controller (GEM) and ARM Cortex-A53 Processor

        * **PL** (Programmable Logic): Xilinx AXI 1G Ethernet Subsystem with multiple AXI DMA blocks

    - Experienced in server-side software development for communication with attached FPGA boards
      ex. Ethernet packet parsing software to receive MIPI data and reconstruct image stream

    - Experienced in system software engineering in multi-threaded applications optimised for speed

        * Direct interactions with various kernel and OS-specific ABI for streamlined performance

        * Direct modifications to server system to enhance single-core and network performance

- Custom IP development with Verilog-based RTL on Vivado

    - Receive parallel data from attached event camera (DVS) sensor and reorganise for AXI4-Stream

    - Created block designs including RTL blocks to generate IP

    - Basic experience with generating functioning IPs based on block designs in Vivado

- Linux Server Management

    - Experienced in protocols such as VNC, SSH and RDP for remote work and automated services

    - System administration for wide range of hardware and software development toolkits

Student Intern: SSAI, SNU

- Research Interest: CNN Architecture and Hardware Design Optimisation

- In tandem with **graduation project** for bachelor's degree from ECE, SNU

KATUSA Human Resources Specialist

• Mandatory military service as a KATUSA Agent (Korean Augmentation To the United States Army)

• Human Resources Specialist (42A) for RSO HHD, 94th Military Police Battalion at Camp Humphreys

Skills

System Software Engineering for Windows and Linux

• Designing and implementing multi-threaded applications for pseudo-real-time workloads

• Thread-safe access to global data structures such as lists, queues and custom `class/struct` objects

• Cross-platform programming with preprocessor conditions for different operating system ABIs

Embedded Systems Design on Multi-purpose SoC FPGAs

• Designing firmware for bare-metal systems with interrupt-based workflow on Vitis 2021.2

• Basic RTL hardware design using Verilog with partial support for AXI4-Stream standards

• Automated digital systems design and layout with Vivado 2021.2