Se-Min Lim

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Education

Mar 2017 – Feb 2019 **Master's Degree**, *Korea University*, Seoul, S. Korea.
GPA - 4.50/4.50 | Major: Electronics Engineering

Mar 2011 – Feb 2017 **Bachelor's Degree**, *Korea University*, Seoul, S. Korea.
GPA - 4.38/4.50 | Major: Electronics Engineering

Research Interest

Artificial Intelligence

- Neural networks, machine & deep learning
- Computational neuroscience, human visual perception & computer vision

Computer Architecture

- FPGA based accelerator for neural networks, low-cost and speed-up method for calculation module

Applications

- Human motion recognition, motion similarity evaluation, neural networks based coaching assistant system

Professional Experience

Feb 2019 – Current **Researcher**, *Korea University Research & Business Foundation*, Seoul, S. Korea.

1) Low-cost Method for Recognizing Table Tennis Activity
   - Implemented cosine similarity based FPGA hardware accelerator for recognizing table tennis activity focused on low-cost and speed-up
2) Activity Recognition from Early-stage Motion
   - Implemented LSTM RNN based new neural networks for recognizing early-stage motions of table tennis activity

Mar 2017 – Feb 2019 **Research Assistant**, *Parallel Computation & VLSI Architecture Lab*, Korea University, Seoul, S. Korea.

1) Deep Learning-Based Assistive System for Table Tennis Practice
   - Designed the systems based on LSTM RNN to inference table tennis's specific posture of a specific player
2) LSTM-Guided Coaching Assistant for Table Tennis Practice
   - Constituted a deep space state model and compared two players' low-dimensional latent trajectories through probabilistic inference
3) Low-cost Assistive System for Table Tennis Practice

- Implemented FPGA based hardware accelerators based on deep learning and cosine similarity inference systems and compared two accelerators

4) Pipelined squarer for unsigned integers of up to 16 bits
   - Applied the pipelining technique to the implementation of squarer and use CSA(Carry-Save Adder) tree and ripple-carry method either

Mar 2015 – Feb 2017 **Undergraduate Researcher**, *Parallel Computation & VLSI Architecture Lab*, Korea University, Seoul, S. Korea.

1) Raspberry Pi 2 Model B-Based CAN Bus Driver
   - Implemented Raspbian based CAN(Controller Area Network) bus protocol driver
2) Kinect Camera-Based Forward Head Posture Correction Device
   - Implemented a portable embedded device that detection of forward head posture and linked the device with Android application
3) Deep Learning-Based Real-time People and Objects Recognition System for Blind People
   - Implemented YOLO CNN based real-time recognition system using NVIDIA TX 1

Mar 2017 – Dec 2018 **Teaching Assistant**, *Korea University*, Seoul, S. Korea.

- Electronic Circuits II, Signals and System I, Electric Circuits II, Pre-Calculus, Calculus
- Introduction to Applied Mathematics, Digital System Laboratory, Discrete Mathematics, Computer Architecture

Publication

[J1] **Se-Min. Lim**, Jooyoung Park, and Hyeong-Cheol Oh, "Low-cost Method for Recognizing Table Tennis Activity", *IEICE Trans. on Information and Systems*, Vol.E102-D, No.10, pp.-, Oct. 2019.

[J2] **Se-Min. Lim**, Hyeong-Cheol Oh, Jaein Kim, Juwon Lee, and Jooyoung Park, "LSTM-Guided Coaching Assistant for Table Tennis Practice", *MDPI Sensors*, 2018, 18(12), 4112-4126, DOI: 10.3390/s18124112.

[C1] Keon-Woo Kim, **Se-Min Lim**, Jooyoung Park, In-Kyeong Ann and Hyeong-Cheol Oh "Activity Recognition from Early-stage Motion", *KCC 2019: Korea Computer Congress 2019*, KIISE, Jeju, Korea (June 26–28, 2019).

[C2] **Se-Min Lim**, Keon-Woo Kim, Jong-Wun Yang, Jooyoung Park, and Hyeong-Cheol Oh "Low Cost Assistive System for Table Tennis Practice", *KCC 2018: Korea Computer Congress 2018*, KIISE, Jeju, Korea (June 20–22, 2018).

[C3] **Se-Min Lim**, Jong-Wun Yang, Jooyoung Park, and Hyeong-Cheol Oh, "Deep Learning based Assistive System for Table Tennis Practice", *KSC 2017: Korea Software Congress 2017*, KIISE, Busan, Korea (December 20–22, 2017).

[T1] **Se-Min Lim**, "AI-Based Coaching System Assistant System for Sports Practice", *Master Thesis*, Korea University, Feb. 2019.

Patents

[1] **Se-Min Lim**, Seongjin Choi, and Hyeong-Cheol Oh, "Pipelined squarer for unsigned integers of up to 16 bits", KR101974779, filed Apr. 25, 2019.

Awards and Fellowships

Awards

Jun 2018 **Best Poster Award**, *Korea Computer Congress 2018*.
Korean Institute of Information Scientists and Engineers

Sep 2016 **Best Research of Undergraduate Student Award**, *Department of Electronic and Eletrical Engineering Congress 2016*.
Korea University

Fellowships

Mar 2017 – Feb 2019 **Fellowships of Research & Teaching Assistant**, *Korea University*.

Jun 2015 – Dec 2016 **National Grant**, *Korea Student Aid Foundation*.

Sep 2016 **Scholarship for Undergraduate Researcher**, *Korea University*.

Dec 2015 **Scholarship of Korea University Alumni Association**, *Korea University*.

Skills

Computer Language Skills

- C/C++, Window/Linux Programming, Python, Verilog, VHDL, MATLAB, HTML

Software Skills

- Visual Studio, PyCharm, iPython Notebook, Jupyter, Spider, Quartus Prime, Viviado, ISE WebPack, Multisim, Microsoft Office