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## RESEARCH INTERESTS

Systems for Machine Learning, Machine Learning for Systems, Neural Network Optimization for Real-time Systems, On-device AI, Hardware-efficient Machine Learning Algorithms

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## EDUCATION

- **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, Republic of Korea  
*Master of Science in Computer Science* Mar 2015 – Feb 2017  
Advisor: Prof. Younhee Lee
- **Ewha Womans University** Seoul, Republic of Korea  
*Bachelor of Science in Computer Science and Engineering* Mar 2011 – Feb 2015  
**Summa Cum Laude**

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## PUBLICATIONS

1. Donghyun Lee\*, **Minkyung Cho\***, Seungwon Lee, Joonho Song, and Changkyu Choi. “**A Novel Sensitivity Metric For Mixed-Precision Quantization With Synthetic Data Generation.**” *IEEE International Conference on Image Processing (ICIP)*, September 2021, \*Equal contribution.
2. **Minkyung Cho**, Younggi Kim, and Younhee Lee. “**Contextual Relationship-based Activity Segmentation on an Event Stream in the IoT Environment with Multi-user Activities.**” *Proceedings of the 3rd Workshop on Middleware for Context-Aware Applications in the IoT (M4IoT)*, December 2016.
3. Dahee Jung, **Minkyung Cho**, Omprakash Gnawali, and HyungJune Lee. “**Proactive Patrol Dispatch Surveillance System by Inferring Mobile Trajectories of Multiple Intruders using Binary Proximity Sensors.**” *The 35th Annual IEEE International Conference on Computer Communication (INFOCOM)*, April 2016.
4. Mijin Kim, **Minkyung Cho**, Aeyoung Kim, and Sang-Ho Lee. “**A VC-based Joint Account Operation Scheme for Mobile Banking.**” *Proceedings of the Korea Computer Congress (KCC)*, August 2013.

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## PATENTS

1. **Minkyung Cho**, Wonjo Lee, and Seungwon Lee. “**Method and Apparatus for Performing Pruning of Neural Network.**” US20210081798A1. Issued Mar 18, 2021. Mounted on Samsung Galaxy S11.
2. Songyi Han, **Minkyung Cho**, and Seungwon Lee. “**A Method and An Apparatus for Performing Convolution Operations.**” US20210201132A1. Issued Jul 1, 2021.
3. Wonjo Lee, Youngmin Oh, and **Minkyung Cho**. “**Apparatus and Method for Channelwise Neural Network Compression.**” Republic of Korea Patent Application No. 20200132151. Filed Oct 13, 2020.
4. **Minkyung Cho**, Searom Choi, and Seungwon Lee. “**Method for Zero-shot Pruning without Retraining.**” Republic of Korea Patent Application No. 20200128136. Filed Oct 5, 2020.
5. Donghyeok Kwon, and **Minkyung Cho**. “**Method of replacing Bilinear Interpolation with Depthwise Transposed Convolution.**” Republic of Korea Patent Application No. 20200111842. Filed Apr 29, 2020.

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## INDUSTRIAL RESEARCH EXPERIENCE

- **Artificial Intelligence Researcher** Suwon, Republic of Korea  
*Samsung Advanced Institute of Technology @ Samsung Electronics* Mar 2018 – Present
  - **Neural Network Optimization:** Designed and implemented hardware-efficient model optimization algorithms for Samsung Exynos NPU & released on Samsung AI SDK.
  - **Software/hardware Co-design:** Designed and implemented a new number system for the next-generation NPU architecture.

## ACADEMIC RESEARCH EXPERIENCE

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- **Research Intern** Remote @ Suwon, Republic of Korea  
*The University of Michigan (Advisor: Prof. Kang G. Shin)* Feb 2021 – Present
  - **Resource allocation on embedded systems:** Found a problem in running vision apps on multi-tenant systems. Designed a resource allocation algorithm to satisfy apps' timing requirements.
  - **Neural Network Optimization:** Reduced resource and computational cost of NN models via mixed-precision quantization.
- **Graduate Research Assistant** Daejeon, Republic of Korea  
*Computer Networks Lab, KAIST (Advisor: Prof. Younghee Lee)* Mar 2015 – Feb 2017
  - **Automated Activity Segmentation System (M4IoT'16):** Found a research topic in IoT environment, designed and implemented automated activity segmentation system, and led to paper submission.
  - **Wireless Sensor Network:** Implemented smart home/office environment using MQTT and TCP protocols, set up testbed on KAIST campus building, and managed IoT data stream from user activities.
- **Undergraduate Research Assistant** Seoul, Republic of Korea  
*Intelligent Networked Systems Lab, Ewha Womans Univ. (Advisor: Prof. HyungJune Lee)* Nov 2013 – Dec 2014
  - **Proactive Patrol Dispatch Surveillance System (INFOCOM'16):** Worked on two core algorithms: 1) inferring future trajectories of multiple intruders in a building and 2) maximizing the detection probability of multiple intruders while minimizing moving distance the patrol officers.
  - **Wireless Sensor Network:** Implemented TinyOS-based ZigBee network consisting of TelosB motes (binary proximity sensors) and set up testbed on Ewha campus building.
- **Undergraduate Research Assistant** Seoul, Republic of Korea  
*Security and Theory of Computing Lab, Ewha Womans Univ. (Advisor: Prof. Sang-Ho Lee)* Dec 2012 – Feb 2013
  - **Visual Cryptography:** Developed joint account management algorithm in mobile banking system based on visual cryptography.

## HONORS AND AWARDS

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- **Korea National Scholarship** Mar 2015  
*KAIST and Korea Ministry of Science and ICT*
- **Dean's List Award** Apr 2012, Oct 2012, Apr 2013, Oct 2013, Apr 2014, Oct 2014  
*Ewha Womans University*
- **3rd Prize, 2014 Ewha Engineering Capstone Design Contest** Dec 2014  
*Ewha Womans University*
- **2nd Prize, 2014 Ewha Engineering Student Portfolio Contest** Dec 2014  
*Ewha Womans University*
- **Choice Award, University Student ICT Vision Contest** Jul 2014  
*SK Telecom*
- **2nd Prize, 2013 Ewha Programming Contest (JAVA)** Mar 2013  
*Ewha Womans University*

## TEACHING AND TECHNICAL SKILLS

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- **Teaching:** Main TA, Introduction to Computer Networks @ KAIST
- **Counseling:** Counseling Assistant for CS Students @ KAIST, Sep 2015 - Aug 2016
- **Tutoring:** Data Structure, Operating Systems, and Java Programming @ Ewha Womans University
- **Languages:** Python, C, Java, Markdown,  $\text{\LaTeX}$
- **Frameworks:** PyTorch, Caffe, MATLAB, Linux, TinyOS