

# Minkyung Cho

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<https://minkyungcho.github.io>

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## RESEARCH INTERESTS

Robust Perception, Multi-Modal Perception, Autonomous Driving, Anomaly Detection, DNN Optimization

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## EDUCATION

- **The University of Michigan** Ann Arbor, MI, USA  
*Ph.D. Student in Computer Science and Engineering* Aug 2022 – Present  
Advisor: Prof. Z. Morley Mao
- **Korea Advanced Institute of Science and Technology (KAIST)** Daejeon, Republic of Korea  
*Master of Science in Computer Science* Mar 2015 – Feb 2017  
Advisor: Prof. Younghee 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. Minkyung Cho, Yulong Cao, Zixiang Zhou, and Z. Morley Mao. “ADoPT: LiDAR Spoofing Attack Detection based on Point-Level Temporal Consistency.” *The 34th British Machine Vision Conference (BMVC)*, November 2023.
2. Minkyung Cho and Kang G. Shin. “DynaMIX: Resource Optimization for DNN-Based Real-Time Applications on a Multi-Tasking System.” *arXiv*, February 2023.
3. 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.
4. Minkyung Cho, Younggi Kim, and Younghee 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.
5. 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.
6. 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. Wonjo Lee, Youngmin Oh, and Minkyung Cho. “Apparatus and Method for Channelwise Neural Network Compression.” *US20220114453A1*. Published Apr. 14, 2022.
2. Minkyung Cho, Searom Choi, and Seungwon Lee. “Method for Zero-shot Pruning without Retraining.” *US20220108180A1*. Published Apr. 7, 2022.
3. Donghyeok Kwon and Minkyung Cho. “Method of replacing Bilinear Interpolation with Depthwise Transposed Convolution.” *US20220067429A1*. Published Mar. 3, 2022.
4. Songyi Han, Minkyung Cho, and Seungwon Lee. “A Method and An Apparatus for Performing Convolution Operations.” *US20210201132A1*. Published Jul. 1, 2021.
5. Minkyung Cho, Wonjo Lee, and Seungwon Lee. “Method and Apparatus for Performing Pruning of Neural Network.” *US20210081798A1*. Published Mar. 18, 2021. *Mounted on Samsung Galaxy S11.*

## ACADEMIC RESEARCH EXPERIENCE

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- **Graduate Student Research Assistant (GSRA)** Ann Arbor, MI, USA  
*The University of Michigan (Advisor: Prof. Z. Morley Mao)* Aug 2022 – Present
  - **Anomaly Detection on Autonomous Driving:** Developing anomaly detection algorithm by checking temporal consistency of 3D point clouds.
  - **Collaborative Perception:** Studying collaborative perception of Connected and Automated Vehicles (CAVs), encompassing both data communication and AI-based perception.
- **Research Intern** Ann Arbor, MI, USA  
*The University of Michigan (Advisor: Prof. Kang G. Shin)* Feb 2021 – Aug 2022
  - **Resource allocation on embedded systems:** Found a problem in running vision apps on a multi-tenant system. 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 an 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 the moving distance of 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.

## INDUSTRIAL RESEARCH EXPERIENCE

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- **Artificial Intelligence Researcher** Suwon, Republic of Korea  
*Samsung Advanced Institute of Technology @ Samsung Electronics* Mar 2018 – Apr 2021
  - **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.

## 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*
- **Academic Scholarship** 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*
- **Han-su Scholarship** Apr 2013  
*Han-su Foundation*
- **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, LLVM, OpenCOOD