

# Minkyung Cho

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<https://minkyungcho.github.io>

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## RESEARCH INTERESTS

Multi-Modal, Efficient AI, Robust AI, Autonomous Driving, Inference and Fine-Tuning Optimization

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## EDUCATION

- **The University of Michigan** Ann Arbor, MI, USA  
*Ph.D. Candidate 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  
*M.Sc. in Computer Science* Mar 2015 – Feb 2017  
Advisor: Prof. Younghee Lee
- **Ewha Womans University** Seoul, Republic of Korea  
*B.Sc. in Computer Science and Engineering* Mar 2011 – Feb 2015  
**Summa Cum Laude**

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## PUBLICATIONS

1. **Cocoon: Robust Multi-Modal Perception with Uncertainty-Aware Sensor Fusion**  
**Minkyung Cho**, Yulong Cao, Jiachen Sun, Qingzhao Zhang, Marco Pavone, Jeong Joon Park, Heng Yang, and Z. Morley Mao  
ICLR 2025
2. **Achieving the Safety and Security of the End-to-End AV Pipeline**  
Noah T. Curran, **Minkyung Cho**, Ryan Feng, Liangkai Liu, Brian Jay Tang, Pedram MohajerAnsari, Alkim Domeke, Mert D. Pesé, and Kang G. Shin  
ACM CSCS Co-located with CCS 2024
3. **ADoPT: LiDAR Spoofing Attack Detection based on Point-Level Temporal Consistency**  
**Minkyung Cho**, Yulong Cao, Zixiang Zhou, and Z. Morley Mao  
BMVC 2023
4. **DynaMIX: Resource Optimization for DNN-Based Real-Time Applications on a Multi-Tasking System**  
**Minkyung Cho** and Kang G. Shin  
arXiv 2023
5. **A Novel Sensitivity Metric For Mixed-Precision Quantization With Synthetic Data Generation**  
Donghyun Lee\*, **Minkyung Cho**\*, Seungwon Lee, Joonho Song, and Changkyu Choi  
ICIP 2021 (\*Equal Contribution)
6. **Contextual Relationship-based Activity Segmentation on an Event Stream in the IoT Environment with Multi-user Activities**  
**Minkyung Cho**, Younggi Kim, and Younghee Lee  
ACM M4IoT Co-located with Middleware 2016
7. **Proactive Patrol Dispatch Surveillance System by Inferring Mobile Trajectories of Multiple Intruders using Binary Proximity Sensors**  
Dahee Jung, **Minkyung Cho**, Omprakash Gnawali, and HyungJune Lee  
IEEE INFOCOM 2016

## PATENTS

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1. **Apparatus and Method for Channelwise Neural Network Compression**  
Wonjo Lee, Youngmin Oh, and **Minkyung Cho**  
US20220114453A1. Published Apr. 14, 2022.
2. **Method for Zero-shot Pruning without Retraining**  
**Minkyung Cho**, Searom Choi, and Seungwon Lee  
US20220108180A1. Published Apr. 7, 2022.
3. **Method of replacing Bilinear Interpolation with Depthwise Transposed Convolution**  
Donghyeok Kwon and **Minkyung Cho**  
US20220067429A1. Published Mar. 3, 2022.
4. **A Method and An Apparatus for Performing Convolution Operations**  
Songyi Han, **Minkyung Cho**, and Seungwon Lee  
US20210201132A1. Published Jul. 1, 2021.
5. **Method and Apparatus for Performing Pruning of Neural Network**  
**Minkyung Cho**, Wonjo Lee, and Seungwon Lee  
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
  - **Efficient Fine-Tuning for Multi-Modal Models:** Developing an efficient and robust fine-tuning framework.
  - **Multi-Modal Perception:** Developed a robust multi-modal perception framework to guarantee reliability and accuracy in diverse driving scenarios.
  - **Anomaly Detection:** Developed a solution by checking temporal consistency at 3D point cloud level.
  - **Collaborative Perception:** Developed robust collaborative perception system across connected and automated vehicles.
- **Research Intern** Ann Arbor, MI, USA  
*The University of Michigan (Advisor: Prof. Kang G. Shin)* Feb 2021 – Aug 2022
  - **Resource Allocation:** Identified a problem in running multiple real-time vision apps on autonomous vehicle. Designed a resource optimization/allocation algorithm to satisfy apps' timing requirements.
  - **Neural Network Optimization:** Reduced resource and computational costs 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
  - **Activity Segmentation:** Designed and implemented an automated activity segmentation system using LSTM model.
  - **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:** 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.

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## INDUSTRIAL EXPERIENCE

- **Deep Learning Software Intern** Santa Clara, CA, USA  
*NVIDIA* Jun 2024 – Aug 2024
  - **Fine-Tuning Optimization:** Working on parameter-efficient fine-tuning techniques for vision and multi-modal models.
- **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.

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## HONORS AND AWARDS

- **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*
- **Han-su Scholarship** Apr 2013  
*Han-su Foundation*

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## TEACHING EXPERIENCE

- **Teaching:** Main TA, Introduction to Computer Networks @ KAIST, Mar 2016 - Aug 2016
- **Counseling:** Counseling Assistant for CS Students @ KAIST, Sep 2015 - Aug 2016
- **Tutoring:** Data Structure, Operating Systems, and Java Programming @ Ewha Womans University

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## SERVICES

- **Reading Group Organizer:** Organize Systems Reading Group @ UMich, Sep 2023 - Present
- **Conference Reviewer:** BMVC'24, NeurIPS-W-Compression'24, ICLR'25, ICLRW-SCOPE'25

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## SKILLS

- **Languages:** Python, C, Java, Markdown,  $\text{\LaTeX}$
- **Frameworks:** PyTorch, Caffe, MATLAB, Linux, TinyOS, LLVM, OpenCOOD