Byunghyun (Ben) Ko

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RESEARCH INTERESTS

- Computer vision and deep learning
- Visual representation learning and self-supervised methods
- Domain adaptation techniques
- Efficient and generalizable medical image analysis

I am particularly interested in developing robust models for understanding complex visual data, with applications in medical imaging, visual recognition, and multi-modal learning.

EDUCATION

University of Notre Dame, Notre Dame, IN — Expected May 2030
Ph.D. in Computer Science and Engineering
Advisor: Dr. Chaoli Wang

Northeastern University, Boston, MA — May 2026
M.S. in Computer Science — **CGPA**: 3.917/4.0

University of Notre Dame, Notre Dame, IN — May 2023
B.A. in Economics, Applied & Computational Mathematics & Statistics (ACMS) — **CGPA**: 3.832/4.0

PUBLICATIONS

Ko, B., Anisimov, A., Ke, K., Bharthepude, S., & Lee, J. "XSSR: Cross-Domain Self-Supervised Representative Selection for Efficient Annotation in Medical Image Segmentation" *International Conference on AI in Healthcare (AIiH)*, 2026. [arXiv]

Tian, A., **Ko, B.**, Qu, K., Liu, M., & Lee, J. "KLO-Net: A Dynamic K-NN Attention U-Net with CSP Encoder for Efficient Prostate Gland Segmentation from MRI" *SPIE Medical Imaging 2026: Image Processing*, 2026. [arXiv]

Ko, B., Tian, A., & Lee, J. "XAG-Net: A Cross-Slice Attention and Skip Gating Network for 2.5D Femur MRI Segmentation" *International Conference on Artificial Intelligence, Computer, Data Sciences and Applications (ACDSA)*, 2025. [arXiv] [code]

HONORS & AWARDS

Northeastern University – SP^2ARK PhD Pathway Apprenticeship ($4,000) — 2026
Northeastern University – Khoury Research Apprenticeship ($7,500) — 2025
Northeastern University – First Place, Student Research and Innovation Showcase — 2025
KSEA UKC 2025 – Best Poster Award — 2025
University of Notre Dame, College of Arts and Letters – Dean's List (6x) — 2019 – 2023

RESEARCH EXPERIENCE

Multimedia Information Group (MIG), Northeastern University — Jan 2025 – Apr 2026
Graduate Research Assistant – Advisor: Prof. Jeongkyu Lee

- Led development of XAG-Net, a 2.5D U-Net with novel pixel-wise cross-slice attention and skip attention gating blocks, attaining a Dice score of 0.9535 on femur segmentation while using 56% fewer parameters than 3D U-Net

- Conducted ablation studies analyzing the core components of XAG-Net, highlighting the primary role of cross-slice attention and its synergy with attention gating blocks
- Contributed to KLO-Net, a lightweight prostate segmentation model with dynamic K-NN attention and cross-stage partial blocks, achieving accuracy comparable to state-of-the-art models while reducing parameter count by 18x
- Developed XSSR, an annotation-efficient cross-domain medical image segmentation framework that uses self-supervised representation learning to reduce target-domain labeling requirements by 95% while maintaining competitive performance.

Department of Political Science, University of Notre Dame Sep 2019 – Mar 2020

Undergraduate Research Assistant – Advisor: Prof. Jeff Harden

- Collected and cleaned state-level policy data from 2013 to 2019 from *The Book of States* using Excel, contributing to an NSF-funded project on state data accessibility
- Researched and resolved statistical inconsistencies, documenting findings in structured text files to support analysis by the research team

TEACHING EXPERIENCE

Northeastern University May 2024 – Dec 2025

Graduate Teaching Assistant, Khoury College of Computer Sciences

- Fall 2025 – Database Management Systems (CS 5200)
- Summer 2025 – Pattern Recognition and Computer Vision (CS 5330)
- Spring 2025 – Data Science Capstone (DS 5500)
- Fall 2025 - Pattern Recognition and Computer Vision (CS 5330)
- Summer 2024 – Data Structures and Algorithms (CS 5008)

DEVELOPMENT EXPERIENCE

Exercise Form Analysis System [GitHub] Jan 2025 – May 2025

- Developed a web-based squat form analysis tool using RTMPose for efficient 2D pose estimation on uploaded videos, with user-selectable performance mode and camera views
- Designed and implemented view-specific metrics (knee angle and hip displacement) to assess squat depth and provide targeted feedback
- Built an interactive UI with Streamlit that outputs annotated GIFs, per-frame metrics, and summary feedback based on pose data

Pocket Caddy App [GitHub] Jan 2024 – May 2024

- Built an Android app in Java to recommend golf clubs based on distance, weather, and user attributes, using the MVVM architecture for consistent data handling
- Integrated chat functionality to the app with OpenAI API by utilizing Volley for network requests to send and receive messages

LEADERSHIP & OUTREACH

President, Multimedia Information Group (MIG), Northeastern University 2026
Project Leader, Student International Business Council, University of Notre Dame 2021
Diversity Commissioner, Keenan Hall Council, University of Notre Dame 2019 – 2020

TECHNICAL SKILLS

- Languages: Python, JavaScript, C, C++, Java, Kotlin, HTML/CSS, MATLAB, R, SQL
- Frameworks: PyTorch, TensorFlow, React, React Native, ExpressJS, OpenCV
- Tools: Git, Android Studio