# **Shiwon Kim**

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### RESEARCH INTERESTS

Continual Learning, Few-Shot Learning, Medical AI, Medical Image Analysis, Digital Healthcare

### **EDUCATION**

**Yonsei University** Mar. 2023 - Aug. 2025

M.Sc., Digital Analytics

Seoul, Korea

• Advisor: Prof. Yu Rang Park

• Thesis: Debiasing Few-Shot Class-Incremental Learning via Dynamic Feature-Classifier Alignment

**Yonsei University** Mar. 2017 - Feb. 2023

B.B.A., Business Administration Seoul, Korea

• Major GPA: 3.73/4.3

**University of Washington** Sep. 2018 - Jun. 2019

Undergraduate Exchange Student, Foster School of Business

Seattle, WA

#### **PUBLICATIONS**

(P: Preprint, J: Journal, C: Conference, W: Workshop, \*: Equal contribution, †: Corresponding author)

[W1] Does Prior Data Matter? Exploring Joint Training in the Context of Few-Shot Class-Incremental Learning **Shiwon Kim**\*, Dongjun Hwang\*<sup>†</sup>, Sungwon Woo\*, Rita Singh<sup>†</sup> ICCV 2025 Workshop on Continual Learning in Computer Vision (CLVision)

[J1] Classification Models for Arthropathy Grades of Multiple Joints Based on Hierarchical Continual Learning Bong Kyung Jang\*, **Shiwon Kim**\*, Jae Yong Yu, JaeSeong Hong, Hong Seon Lee, Jiwoo Park, Jeesoo Woo, Young Han Lee<sup>†</sup>, Yu Rang Park<sup>‡</sup> La Radiologia Medica (IF 2024: 9.7)

# RESEARCH EXPERIENCE

### Digital Healthcare Lab (DHLab)

Mar. 2023 - Jun. 2025

Department of Biomedical Systems Informatics, College of Medicine, Yonsei University Graduate Research Assistant (Advisor: Prof. Yu Rang Park)

Seoul, Korea

# • Continual Classification of Arthropathy Grades in Multiple Joints

[Paper] [Code]

Developed and validated a continual learning framework for arthropathy grade classification scalable across multiple joints, using hierarchically labeled radiographs of the knee, elbow, ankle, shoulder, and hip from three tertiary hospitals.

### • Robust Medical Image Classification Against Data Contamination and Poisoning

[Slides]

Designed a deep mutual learning framework that jointly trains two networks to learn a shared representation space anchored by a fixed equiangular tight frame (ETF) classifier, improving model robustness and generalization.

» **Q** 2nd Place, Yonsei Digital Healthcare Cybersecurity Competition

### Statistical Feature-Based Machine Learning for Memory-Efficient Fake Image Detection

[Slides]

Developed a machine learning-based fake image detection pipeline that leverages pixel-level statistics, texture patterns, and edge information, achieving higher accuracy with lower memory usage than CNN-based deep learning approaches.

» • Presented at Digital Healthcare Human Resources Development Program

# **Carnegie Mellon University**

Aug. 2024 - Feb. 2025

Pittsburgh, PA

Software and Societal Systems Department (S3D), School of Computer Science Visiting Scholar, Intensive AI Education Program, fully funded by the Korean Government (IITP)

# • Exploring Joint Training in the Context of Few-Shot Class-Incremental Learning

[Paper] [Code]

Challenged the assumption of limited access to prior data in few-shot class-incremental learning, and compared joint training with incremental learning to empirically assess the practical impact of full data access on model performance.

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### • AI-Driven Automated Target Prioritization and Engagement

[Slides] [Video]

Implemented a real-time nearest-target tracking algorithm and a shoot (and don't shoot) logic based on fine-tuned YOLOv11s. Deployed the system on Jetson Orin Nano and demonstrated engagement of both stationary and moving targets.

## • Image Quality and Abstract Perception Evaluation

[Report]

Enhanced the interpretation of abstract image perceptions by combining CLIP-IQA and UIQA with a multi-branch backbone, demonstrating superior accuracy and faster convergence compared to existing image quality assessment (IQA) methods.

#### WORK EXPERIENCE

#### **Medical Informatics Collaboration Unit (MCU)**

Jul. 2025 - Present

Department of Biomedical Systems Informatics, College of Medicine, Yonsei University Research Assistant in AI and Data Analytics Seoul, Korea

# **HONORS AND AWARDS**

#### Academic Excellence Award (2nd Place), Intensive AI Education Program, IITP

Feb. 2025

Awarded to top 3 of 34 participants for academic excellence in selected courses at Carnegie Mellon University. Selected courses:

- 11-785 Introduction to Deep Learning
- 11-775 Large Scale Multimedia Analysis
- 11-611 Natural Language Processing

# 2nd Place, Yonsei Digital Healthcare Cybersecurity Competition, Yonsei University

Aug. 2024

Recognized for developing a robust medical image classification model against data poisoning.

# 1st Place, NAVER Shopping × ISSU IT Collaboration Project, Yonsei University

Jun. 2021

Recognized for proposing user-centric product search and recommendation systems for e-commerce.

# Quarterly Dean's List, University of Washington

Winter 2019

Awarded to students with a quarterly GPA of 3.50 or higher in at least 12 graded credits.

### **GRANTS AND FELLOWSHIPS**

# Intensive AI Education Program @ Carnegie Mellon University

Aug. 2024

Institute of Information & Communications Technology Planning & Evaluation (IITP) Selected as one of 34 graduate students nationwide, full support of tuition and living expenses

#### SELECTED TALKS

### Digital Healthcare Human Resources Development Program

Jan. 2024

Korea Institute for Advancement of Technology (KIAT), Ministry of Trade, Industry and Energy (MOTIE) Student Project Presentation on Medical AI and Cybersecurity

Seoul, Korea

### LEADERSHIP AND ACTIVITIES

#### Yonsei University Ski Team

Mar. 2017 - Present

- Alumni Executive Member since 2023
- Team Captain in 2020-21
- Training Lead in 2019-20 and 2021-22

# Information System SIG of Undergraduate (ISSU), Yonsei University

Mar. 2021 - Dec. 2021

• Vice President in Fall 2021

# University of Washington Husky Ski Team

Sep. 2018 - Jun. 2019

### Yonsei University × Claremont McKenna College (CMC) Summer Leadership Program

Jul. 2018 - Aug. 2018

• Collaborated with 10 CMC students on a business project and Singapore networking trip.

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# **REFERENCES**

Yu Rang Park, Associate Professor at Yonsei University

Email: yurangpark@yuhs.ac

Jae Yong Yu, Assistant Professor at Hallym University

Email: icalust@hallym.ac.kr

Vijay Sai Vadlamudi, Adjunct Assistant Teaching Professor at Carnegie Mellon University

Email: vijaysai@cmu.edu

**Rita Singh**, Research Professor at Carnegie Mellon University

Email: rsingh@cs.cmu.edu

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