MINHYEK JEON

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RESEARCH INTERESTS

- Computer Vision, Generative Model, Medical Imaging, Clinical AI
- Structural Biology, Molecular Dynamics, Drug Design

EDUCATION

CARNEGIE MELLON UNIVERSITY *Aug.2023 – May.2025*
School of Computer Science
Master of Science, Computational Biology
- GPA of 3.97

KOREA UNIVERSITY *Mar.2017 – Aug.2023*
Bachelor of Science, Biotechnology (Military service for *2018-2019*)
Bachelor of Engineering, Artificial Intelligence
- GPA of 4.08/4.5

PUBLICATION

Similar but Distinct Comorbidity Patterns Between Polycystic Ovary Syndrome and Endometriosis in Korean Women: A Nationwide Cohort Study
Hye Gyeong Jeong, **Minhyek Jeon***, Ki-Jin Ryu, Jina Kim, Yoonjung Yoonie Joo, Hyuntae Park*
JKMS 2024 – Under Revision

Multimodal Integration of Neuroimaging and Genetic Data for the Diagnosis of Mood Disorders Based on Computer Vision Models
*Yongwon Cho, Seungeun Lee, Yuyoung Ji, **Minhyek Jeon**, Aram Kim, Yoonjung Yoonie Joo*
Journal of Psychiatric Research Vol 172, 2024

Modeling of Metabolic Syndrome Outbreaks Due to Climate Crisis and Reconsidering the Direction of International Development Cooperation in Eritrea
Yeeun Kim, Yeeun Lim*, **Minhyek Jeon***, Sieun Choo, Seongju Kim, other 3 authors*
Journal of Africa Future Society, 2023

Biomedical Data Management, Knowledge Graphs, and Deep Learning
Jędrzej Kubica, Rachit Kumar*, Glenda Hui-En Tan*, Van Q.Truong*, David Enoma, Nicholas P. Cooley, **Minhyek Jeon**, Other 15 authors*
BioHackrXiv Preprints, 2023

PATENT APPLICATION

***Red Achyranthes Japonica Nakai Root*, 10-2022-0098230 Republic of Korea, 2022**
Invented a novel method of decreasing hemolysis side effects of *Achyranthes japonica* Nakai Root by applying a heat treatment that mainly includes steaming and drying processing methods.

POSTER PRESENTATION

Confidence-guided Semantic Correspondence
The Institute of Electronics and Information Engineers Conference, 2022
*Jiwon Kim, **Minhyek Jeon**, Suhyung Choi, Kyusun Cho, Kwangrok Ryoo, Seungryong Kim*

Association between PCOS and EMs by Comorbidity Analysis: The National Health Insurance Service - National Sample Cohort Study

메모 포함[동정1]: 대문자

***Minhyek Jeon**, SeungHyun Nam, Ki-Jin Ryu, Hye Gyeong Jeong, Yoonjung Yoonie Joo, Hyuntae Park*
Korea Society for Reproductive Medicine 2022 Spring Conference/2022 Fall Conference

Climate Change and Diabetes: Survey of Eritrea and Recommendations
***Minhyek Jeon**, Kieun Kwon, Seongju Kim, Ye Eun Lim, Ye Eun Kim, Sieun Choo*
Korea Association of International Development and Cooperation, Annual Conference, 2022

메모 포함[동정2]: 대문자?

RESEARCH EXPERIENCE

Human Sensing Lab Research Intern *Jan.2024 – Now*
Advisor: Prof. Fernando De la Torre, Robotics Institute at Carnegie Mellon University

• Augmenting Chest X-ray Images using Latent Diffusion Model

Handled class imbalance problem of Chest X-ray dataset by generating samples by applying various generative models, including DreamBooth, SDEdit, and ControlNet. Focused on enhancing classification accuracy.

메모 포함[동정3]: models, including DreamBooth, SDEdit, and ControlNet.

메모 포함[동정4]: Focused

David Ryan Koes Lab M.S. Researcher *Jan.2024 – May.2024*
Department of Computational and Systems Biology at University of Pittsburgh

• Implicit Transfer Operator Learning Model

Researched simulating molecular dynamics across various time resolutions. Applied denoising diffusion probabilistic models to generate accurate stochastic dynamics to improve computational efficiency.

Jose Lugo-Martinez Lab M.S. Researcher *Sep.2023 – Dec.2023*
Computational Biology Department at Carnegie Mellon University

• Detecting Fusion Events of Biomolecule

Worked on developing an automated image analysis pipeline for tracking and merging events of ALT-associated promyelocytic leukemia nuclear bodies.

메모 포함[동정5]: tracking and

Robot Intelligence Lab Undergraduate Researcher *Sep.2022 – Dec.2022*
Advisor: Prof. Sungjoon Cho, Dept. of Artificial Intelligence at Korea University

• Elevator Recognition Software for Indoor Autonomous Driving Robots

Collaborated with ROBOTIS Co. to develop software enabling robots to detect and use elevator buttons. Employed a two-step hierarchical approach for detection and segmentation, utilizing diffusion and patch augmentation to enhance classification. Software currently used in the product.

메모 포함[동정6]: S 추가

메모 포함[동정7]: , utilizing diffusion and patch augmentation to enhance classification.

Computer Vision Lab Undergraduate Researcher *Dec.2020 – Aug.2022*
*Advisor: Prof. Seungryong Kim***,** Dept. Computer Science and Engineering at Korea University

• Semantic Correspondence Model

Developed effective semi-supervised networks that establish key points match across similar images by using confidence estimation. Handled the intra-class variations and background clutters issue.

SPONSORED GOVERNMENT PROJECTS

Enhancing Satellite Image Object Detectors Using Generative AI *Jan.2022 – Now*
Sponsor: United States Department of Defense
Enhanced the generalization of object detectors across diverse geographical regions using generative AI. Adapted detectors using minimal images by fine-tuning Stable Diffusion. Utilized synthetic images generated by ControlNet and GLIGEN to improve object detectors' adaptability and performance.

메모 포함[동정8]: 이거 그냥 Enhanced the generalization of object detectors across diverse geographical regions using generative AI 이렇게 쓰면 안돼?

메모 포함[동정9]: Utilized

Public Interest Medical Technology Research Project: *Mar.2022 – Sep.2022*
Association analysis between polycystic ovary syndrome and Endometriosis
Sponsor: Ministry of Health and Welfare, Korea Government
Extracted and analyzed 1,025,340 patients' clinical data. Performed phenome-wide association studies or comorbidities to identify conflicting features between polycystic ovary syndrome and endometriosis.

메모 포함[동정10]: 일관성을 위해서 Performed phenome-wide association studies or cormorbidities 로 쓰는게 나을듯

Style transfer network model for conversion of Photographic to Artistic painting *Jun.2022 – Sep 2022*
Sponsor: ETRI(Electronics and Telecommunications Research Institute)

메모 포함[동정11]: 쉼표 지워주세요

Developed a framework to convert photos into artistic paintings to create a new artistic painting database from existing image databases.

WORK EXPERIENCE

Korea University Institute of Data Science Internship, Seoul, Korea *June.2022 - Aug.2023*
Researched gynecology diseases based on the analysis of the patient diagnostic and medical check-up data. Focused on the association between COVID-19 and abnormal uterine bleeding and endometrial pathology.

Department of Radiology Research Internship *Mar.2022 - Feb.2023*
Korea University Anam Hospital, Seoul, Korea
Researched the integration of neuroimaging and genetic factors as potential biomarkers for major depressive disorder. Utilized multimodal fusion of MRI T1 sequences and DNA genotype datasets to develop a multimodal architecture that outperforms unimodal approaches in weakly-supervised learning.

World Federation of United Nations Association *Apr.2022 - Aug.2022*
Headquarters of the United Nations, New York, USA
Worked as a data scientist to analyze the correlation between Eritrea's environmental features and 131 disease types. Utilized machine learning to extract and predict future risk factors.

U21 sustainable Micro-internship, Bangalore, India - online based *Mar.2022 - Apr.2022*
Worked with ICA on driving transformative systemic change through climate action. Focused on SDGs goal 13 and ways to accelerate accelerate low-carbon sustainability.

Conscripted Police as an English Specialist, Korea National Police Agency *Apr.2018 - Dec.2019*
Worked as an English interpreter and translator for the official residences of ambassadors from Turkey, Japan, Saudi Arabia, and China, as well as for the Seoul Seongbuk Police Station.

AWARDS & HONORS

Semester High Honors at Division of Biotechnology, Korea University *Jan. 6th, 2022*
2020(2nd Semester), 2022(1st Semester), 2022(2nd Semester)

Future Leaders Scholarship, Korea University *Sep 1st, 2022*
2022(2nd Semester) Partial tuition waived

Award Certificate, Seoul Metropolitan Police Agency *Oct. 21st, 2019*
Received an award for developing a software that automatically organizes work schedules, thus contributing to the development of police administration.

Encouragement Certificate, Security Department, Seongbuk Police Station *Jun. 27th, 2019.*
Received an award for a strong sense of duty and for being an exemplary police officer.

LANGUAGE & TECHNICAL SKILLS

Language
Korean (First language), English (Fluent), German (Intermediate)

Technical skills
Python(Pytorch, Tensorflow), MATLAB, C, C+, GO, R,
Linux, MySQL, SAS, Gephi, Prism, HTML, CSS, Java,
Figma, Adobe Photoshop, Adobe Premiere Pro, AutoCAD

MISC.

Member of MENSA: IQ score: 156 (Top 1% of the general population)

Youth Policy Governance Committee, Seoul Metropolitan Government: Worked on the Youth Policy Governance Committee, identifying the needs of Seocho-gu residents and proposing policy agendas.

FC Gongdori - Football Club: Played as captain and led the team to second place in Korea University football tournament

메모 포함[동정12]: 이거 대문자로 한 이유가 있나?
메모 포함[동정13]: The 추가
메모 포함[동정14]: The 추가
메모 포함[동정15]: And 로 써주세요
메모 포함[동정16]: 마침표 찍어주세요
메모 포함[동정17]: driving
메모 포함[동정18]: Led