

# DILLAN IMANS

## AI RESEARCHER IN MEDICINE

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### RESEARCH INTEREST

I work at the intersection of medical imaging AI and multimodal learning, with experience in retinal fundus images, brain MRIs, and surgical vision, and am increasingly interested in computational biology and genomics. I aim to develop clinically meaningful AI systems that integrate imaging and molecular data, prioritizing applications in under-resourced and underserved healthcare settings.

### RESEARCH EXPERIENCE

#### Undergraduate Research Intern @ Superintelligence Lab SKKU, South Korea Oct 2024 - Present

- Led a year-long first-author project on unsupervised domain adaptation for brain tumor segmentation, overseeing full research development from design to publication, culminating in **acceptance at IEEE BIBM 2025**.
- Collaborated with a graduate student on a glaucoma detection system, contributing to data preprocessing, model development, and integration into an interactive research demo.
- Contributed to an industry-aligned fundus optic-cup and vessel analysis pipeline by assisting with model development and adapting the system for real-world deployment.
- Initiated a new research direction on brain-eye shared embeddings, exploring cross-modality alignment between MRI and fundus images for joint risk prediction tasks.

#### Undergraduate Research Intern @ Labren CUHK, Hong Kong Jun 2024 - Present

- Contributed extensively to a large-scale surgical video dataset, including data collection, preprocessing, annotation design, and baseline experiments, forming the foundation of a **submission to a leading machine learning journal**.
- Helped build temporally structured samples for a benchmarking study on surgical action planning, contributing to a **submission to CVPR 2026**.
- Assisted in curating and annotating a multimodal surgical action dataset in collaboration with **NVIDIA**, contributing to a **submission to CVPR 2026**.
- Maintained and optimized Python-based preprocessing and dataset-management pipelines, ensuring consistency and scalability across all projects while coordinating closely with senior researchers under tight deadlines.

#### Undergraduate Research Intern @ Infolab SKKU, South Korea Feb 2024 - Oct 2024

- Designed an explainable multi-layer ensemble model for depression detection and severity prediction using behavioral and observational features.
- Published this work as first author in Diagnostics (Oct 2024)**, demonstrating potential for clinical decision support in mental health screening.

### PUBLICATIONS

- Imans, D.**, Abuhmed, T., Alharbi, M., & El-Sappagh, S. (2024). *Explainable Multi-Layer Dynamic Ensemble Framework Optimized for Depression Detection and Severity Assessment*. Diagnostics, 14(21), 2385. <https://doi.org/10.3390/diagnostics14212385>
- Imans, D.**, Bui, P.N., Le, D.T., Choo, H. *Unsupervised Domain Adaptation with SAM-RefiSeR for Enhanced Brain Tumor Segmentation*. Accepted at IEEE BIBM 2025.
- He, Y., Guo, P., Xu, M., Li, Z., **Imans, D.**, et al. SurgWorld: Learning Surgical Robot Policies from Videos via World Modeling. Preprint, under review at CVPR 2026. <https://arxiv.org/abs/2512.23162>

- Xu, M., Huang, Z., **Imans, D.**, Ye, Y., Zhang, X., Dou, Q. *SAP-Bench: Benchmarking Multimodal Large Language Models in Surgical Action Planning*. Preprint, under review at CVPR 2026. <https://arxiv.org/abs/2506.07196v1>
- Manuscript on surgical action understanding using vision models. Under review at a major machine learning journal.

## EDUCATION

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**Bachelor's of Computer Science and Engineering, Sungkyunkwan University, South Korea**

**Aug 2022 - Jun 2026**

- GPA: 4.09 / 4.5 (95.9 / 100)
- Honors: Dean's List (2023), Academic Excellence Scholarship

### Relevant Coursework

- **AI/CS:** Deep Neural Networks, Big Data Analytics, Linear Algebra, Probability, Calculus
- **Biology:** Biological sciences I-II, Chemistry II, AI in Molecular Biology, Functional Genomics

## OTHER PROJECTS

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### Computational Modeling of Collagen Triple-Helix Mutations Using AlphaFold

Modeled COL1A1 triple-helix segments to investigate how Gly→Val substitutions disrupt structural stability. Predicted WT and mutant complexes using ColabFold, quantified helix distortion through RMSD analysis, and related structural defects to known mechanisms of osteogenesis imperfecta.

*Tech: Python, ColabFold, PyMOL*

### Foodie App - AI-Powered Ingredient Recognition Mobile Application

Worked in a team to develop a cross-platform application that identifies ingredients from fridge photos using OpenAI's vision APIs and recommends recipes via integrated Spoonacular API search. Contributed to the Flask backend which includes user authentication, cloud storage, and personalized preference-based recommendations.

*Tech: Flask, Firebase Firestore, OpenAI API, REST APIs, MVVM architecture*

## TECHNICAL SKILLS

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**Programming:** Python, C/C++, Java, Javascript, React/Redux, Node.js, MongoDB, Git, Linux

**ML/AI:** PyTorch, MONAI, OpenCV, computer vision, multimodal learning

**Computational Biology:** Sequence analysis (BLAST, MSA), Structural modeling (AlphaFold/ColabFold)

## ADDITIONAL INFORMATION

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### Languages

English & Indonesian (Fluent), Mandarin & Korean (Conversational), French (Beginner)

### Interests

Quantitative Finance, Piano, Cooking, Basketball

### References

Available upon request