

# Chanyeong Heo

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## Research Interests

My research focuses on artificial intelligence (AI), particularly on **Core** (diffusion theory-based models) + **Domain** (medical imaging). Specifically, my work involves generating synthetic medical data using diffusion models and leveraging this data to address data scarcity and improve medical image segmentation.

My key research interests include:

Diffusion Models, Medical Imaging, Medical Image Segmentation, Data Analysis using Generative AI

## Education

### Myongji University

Mar 2024 - Present

- M.S. in Information and Communication Engineering
- DataScience Lab / Advisor: Jaehee Jung
- Total GPA of 4.5/4.5

### Myongji University

Mar 2018 - Feb 2024

- B.S. in Information and Communication Engineering
- Total GPA of 4.02/4.5, Major GPA of 4.24/4.5

## Internships

### DataScience Lab, Advisor: Jaehee Jung

May 2022 - Feb 2024

- Undergraduate Researcher
- Participated in paper seminars, published three domestic research papers, and conducted various research projects

## Grants

1. 허찬영, "심장질환 예측을 위한 심초음파와 의료텍스트 데이터의 멀티모달 조건부 디퓨전 모델", *NRF 석사과정생연구장려금지원*, RS-2024-00461002 (₩12,000,000)

Sep 2024 - Aug 2025

## Publications

### International Publications (Published and Accepted)

1. **Controllable Mask Diffusion Model for medical annotation synthesis with semantic information extraction**

**Chanyeong Heo**, Jaehee Jung

*Computers in Biology and Medicine* [Impact Factor: 6.3]

2. **Semantic Interpolative Diffusion Model: Bridging the Interpolation to Masks and Colonoscopy Image Synthesis for Robust Generalization**

**Chanyeong Heo**, Jaehee Jung

*International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI) (Top-tier conference in medical AI)*, 2025

[\[code\]](#)

3. **ReCDAP: Relation-based Conditional Diffusion with Attention Pooling for Few-Shot Knowledge Graph Completion**

Jeongho Kim, **Chanyeong Heo**, Jaehee Jung

*Proceedings of the 48th International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR) (Top-tier conference in information retrieval AI)*, 2025

[\[arXiv\]](#) [\[code\]](#)

## Domestic Publications

1. **Generating Diverse Colonoscopy Images with Background-Weighted Semantic Diffusion Model**  
**Chanyeong Heo**, Jaehee Jung  
*Proceedings of The International Conference on Next Generation Computing (ICNGC)*, 2024 - **Best Paper Award**
2. **Semantic Diffusion Model을 활용한 고화질 대장내시경 영상 생성 및 과정 분석**  
허찬영, 정재희  
2024 한국차세대컴퓨팅학회 춘계학술대회, 2024
3. **Implicit Generative Model의 잠재 공간 내 보간을 활용한 부드러운 전환으로 두 음성 합성 방법 연구**  
허찬영, 정재희  
한국차세대컴퓨팅학회 논문지 제19권 제5호, 2023
4. **DCGAN의 잠재 벡터 보간을 활용한 두 음성 합성 방법**  
허찬영, 정재희  
2023 한국차세대컴퓨팅학회춘계학술대회, 2023 - 우수 논문
5. **소수 클래스 생성 성능 향상을 위한 cGAN 기반 Class-Balanced Batch 구성 방법 제안**  
허찬영, 정재희  
2023 한국정보과학회 컴퓨터종합학술대회, 2023

## Preprints or Manuscripts Under Review

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1. **HADP: Hybrid A\*-Diffusion Planner for Robust Navigation in Dynamic Obstacle Environments**  
Mingyu Kim\*, **Chanyeong Heo\***, Jaehee Jung (\*co-first authors)  
*IEEE Access*[Impact Factor: 3.6]
2. **Semantic Information Loss Function: A Novel Approach Addressing the Limitations of Pixel-Based Segmentation Loss in Medical Image Segmentation**  
**Chanyeong Heo**, Mingyu Kim, Jaehee Jung  
*IEEE Access*[Impact Factor: 3.6]

## Patents

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1. **System for producing dynamic obstacle avoidance path using conditional diffusion model**  
**Chanyeong Heo**, Mingyu Kim, Jaehee Jung  
Korean Patent, No. 10-2025-0053198
2. **Method for producing dynamic obstacle avoidance path using conditional diffusion model**  
**Chanyeong Heo**, Mingyu Kim, Jaehee Jung  
Korean Patent, No. 10-2025-0053197
3. **Medical image generation system and medical image generation method including controllable lesion area**  
**Chanyeong Heo**, Jaehee Jung  
Korean Patent, No. 10-2024-0092603

## Awards & Honors

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|---|-----------|
| 1. Myongji Outstanding Freshmen Scholarship, Myongji University               | 2024-2025 |
| 2. Best Paper Award (Oral), ICNGC   | 2024      |
| 3. Myongji BaekMa Scholarship (Half Tuition), Myongji University (₩2,270,000) | 2023      |

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| 4. Academic Activities Encourage Scholarship, Myongji University (₩1,000,000)                 | 2023 |
| 5. 1st Place Award, SW프로그램 경진대회, Myongji University (₩1,000,000)                              | 2023 |
| 6. Myongji BaekMa Scholarship (Full Tuition), Myongji University (₩4,547,000)                 | 2023 |
| 7. Academic Activities Encourage Scholarship, Myongji University (₩500,000)                   | 2023 |
| 8. Best Paper Award (Oral), 한국차세대컴퓨팅학회춘계학술대회  | 2023 |
| 9. Encouragement Award, Korea K-Hackathon 10, 과학기술정보통신부                                       | 2022 |
| 10. 1st Place Award, 5군단 AI Makerthon, 5군단 & Naver (Prize: Field Trip to Silicon Valley, USA) | 2021 |
| 11. Outstanding Award, 5군단 AI Ideathon, 5군단 & KT  | 2021 |

## Extracurricular Activities

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| 1. Club Leader, Student Soccer Club, Dept. of Information and Communication Engineering, Myongji University            | Mar 2022 - Dec 2022 |
| 2. Student Council, Planning & Sports Division, Dept. of Information and Communication Engineering, Myongji University | Mar 2019 - Dec 2019 |
| 3. Student Council, Planning & Sports Division, Dept. of Information and Communication Engineering, Myongji University | Mar 2018 - Dec 2018 |

## Skills

**English:** TOEIC: 780, TEPS: 320

**Programming:** Python, C

**Deep Learning:** Pytorch, Tensorflow, Scikit-learn, Keras

**Data Analysis:** Numpy, Pandas, Matplotlib, Seaborn