# Donggeun **Ko**

APPLIED ARTIFICIAL INTELLIGENCE · MOLECULAR BIOTECHNOLOGY

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## Education

**Sungkyunkwan University (SKKU)** — *Suwon, S.Korea*
MSC. IN APPLIED ARTIFICIAL INTELLIGENCE — *Mar. 2022 - Present*
- GPA: 4.19/4.5
- **Interest:** Computer Vision, Generative AI, Debiasing, Multi-Modal

**Ghent University Global Campus (GUGC)** — *Incheon, S.Korea & Gent, Belgium*
B.S. IN MOLECULAR BIOTECHNOLOGY — *Aug. 2015 - Aug. 2021*
- Belgium ECTS Score: 14.6/20 (Cum Laude)
- Received academic scholarship for academic excellence (top 10%).
- **Thesis:** Interpreting Neural Networks Trained for Detecting Translation Initiation Sites in DNA Sequences with Adversarial Inputs
  Advised by: Dr. Utku Ozbulak, Prof. Wesley De Neve

## Experience/Internship

**SKT AI Fellowship** — *Seoul, S.Korea*
INTERN FELLOWSHIP — *Jun. 2022 - Nov. 2022*
- Develop deep learning model to colorize past historical gray scale images of South Korea backgrounds (war, riots, daily life).
- Won the Grand Prize

**Undergraduate Research, Centre for Biosystems and Biotech Data Science (Prof. dr. Wesley De Neve)** — *Incheon, S.Korea*
RESEARCHER — *Jul. 2020 - Aug. 2020*
- Researched on detecting translation initiation sites in DNA sequences using Deep Learning models

**Undergraduate Research, Plant Biotechnology Research Centre (Prof. dr. Hoo Sun Chung)** — *Incheon, S.Korea*
RESEARCHER — *June. 2020 - Jul. 2020*
- Researched on recombinant DNA preparation and functional assays for metabolic pathways in Arabidopsis Protoplasts

**Undergraduate Research, Biomedical Research Centre (Prof. dr. Magdalena Radwanska)** — *Incheon, S.Korea*
RESEARCHER — *Dec. 2019*
- Researched on magnetic-beads based purification of apoptotic B cell lymphomas

## Extracurricular Activity & Teaching

**Pseudo Lab Text-to-Image Generation Paper/Code Contributor** — *Suwon, S.Korea*
CONTRIBUTOR & LEARNER — *May. 2023 - Dec. 2023*
- Review papers and code related to image generation and generative AI and conducted various experiments by fine-tuning diffusion based models

**Application and Foundation of AI** — *Suwon, S.Korea*
TEACHING ASSISTANT — *Mar. 2023 - Dec. 2023*
- Teaching Assistant for Application and Foundation of AI course for Spring Semester 2023, Summer school 2023.

**NH Nonghyup Data Science Project Special Lecture** — *Seoul & Suwon, S.Korea*
TEACHING ASSISTANT — *May. 2023 - July. 2023*
- Teaching assistant and project guidance manager for NH Nonghyup Data Science Project for employees in NH.

**Executive Student Council, Ghent University Global Campus** — *Incheon, S.Korea*
VICE PRESIDENT, SENIOR STUDENT REPRESENTATIVE, SPOKESPERSON — *Sept. 2020 - Jun. 2021*
- Lead the university and bridged the connection between students and professors as a member of executive student council.

**University Ambassador, Ghent University Global Campus** — *Incheon, S.Korea*
MEMBER — *Sep. 2020 - Jun. 2021*
- Represented the university and assisted advertising the university.

**Summer & Fall Academic Tutoring**                                        *Incheon, S.Korea*

Lᴇᴄᴛᴜʀᴇʀ/Tᴜᴛᴏʀ                                                            *Jun. 2019 - Nov. 2019*

- Taught university Physics I and II course in Ghent University Global Campus over the Summer and Fall.

**Winter Academic Tutoring**                                              *Incheon, S.Korea*

Lᴇᴄᴛᴜʀᴇʀ/Tᴜᴛᴏʀ                                                            *Dec. 2019 - Feb. 2020*

- Taught Physics II full course in Ghent University Global Campus over the Winter break.

## Honors & Awards

2023    **Scholarship**, Academic Scholarship from Convergence Program for Social Innovation          *Seoul, S.Korea*

2023    **Best Paper (AI and Agents)**, SAC2023 Best Paper Award, MGCMA: Multi-scale Generator with Channel-wise          *Tallinn Estonia*
        Mask Attention to generate Synthetic Contrast-enhanced Chest Computed Tomography

2022    **Grand Prize**, 4th SKT AI Fellowship          *Seoul, S.Korea*

2021    **1st Place**, 4th AI Grand Challenge Phase 3 Track 1 - Minister's Award          *Seoul, S.Korea*

2019    **Scholarship**, Academic Merit-Based Scholarship          *Incheon, S.Korea*

## Projects

**Colorize past historical Korean grayscale images into colored images via Deep learning models**          *Suwon, S.Korea*

Aꜱꜱɪꜱᴛᴀɴᴛ Rᴇꜱᴇᴀʀᴄʜᴇʀ                                                       *July. 2022 - Dec. 2022*

- In collaboration with SKT SuperNova team, developed a deep learning model that can automatically colorize grayscale images of South Korean backgrounds including war, riots and daily life.

**Detecting rusts and contamination in trusses of Korean Bridges**          *Suwon, S.Korea*

Lᴇᴀᴅᴇʀ/Hᴇᴀᴅ Rᴇꜱᴇᴀʀᴄʜᴇʀ                                                    *Mar. 2023 - Jun. 2023*

- In collaboration with Ko-mapper, utilzed pre-trained object detection and segmentation models to detect rusts and contamination in trusses of Korean bridges via fine-tuning and data-engineering.

**Anomaly Detection for Contrast Enhanced Computed Tomography Images in Lung Settings**          *Suwon, S.Korea*

Lᴇᴀᴅᴇʀ/Hᴇᴀᴅ Rᴇꜱᴇᴀʀᴄʜᴇʀ                                                    *May. 2022 - Dec. 2023*

- In collaboration with Gangbuk Samsung Hospital (Prof. Yoongyu Lee and Sooyeon Ham), developed one-class anomaly detection model to detect CT images with lung lesions.

**Discovering and classifying possible side-effects for Pembrolizumab medication using AI**          *Suwon, S.Korea*

Lᴇᴀᴅᴇʀ/Hᴇᴀᴅ Rᴇꜱᴇᴀʀᴄʜᴇʀ                                                    *May. 2022 - Dec. 2023*

- In collaboration with PEPV laboratory, SKKU, developed an artificial intelligence-based adverse drug reaction prediction model using the WHO-Vigibase-based global database

**A study on artificial contrast enhancement in chest computed tomography (CT) using deep learning**          *Suwon, S.Korea*

Aꜱꜱɪꜱᴛᴀɴᴛ Rᴇꜱᴇᴀʀᴄʜᴇʀ                                                       *Nov. 2021 - Current*

- In collaboration with doctors of Gangbuk Samsung Hospital (Prof. Yoongyu Lee and Sooyeon Ham), developed a model to generate synthetic CECT images from NCCT images for patients who have potential side-effect for iodinated contrast media.

## Publications

**AmpliBias: Mitigating Dataset Bias through Bias Amplification in Few-shot Learning for Generative Models**          *Birmingham, UK*

Cᴏɴꜰᴇʀᴇɴᴄᴇ ᴏɴ Iɴꜰᴏʀᴍᴀᴛɪᴏɴ ᴀɴᴅ Kɴᴏᴡʟᴇᴅɢᴇ Mᴀɴᴀɢᴇᴍᴇɴᴛ (**CIKM**), 2023          *October 21-25, 2023*

First author

**MGCMA: Collaboration between Radiologist-AI in Generating Synthetic Contrast-enhanced Chest Computed Tomography from Non-contrast Images using Multi-scale Generator with Channel-wise Mask Attention**          *Tallinn Estonia*

ACM/SIGAPP Sʏᴍᴘᴏꜱɪᴜᴍ Oɴ Aᴘᴘʟɪᴇᴅ Cᴏᴍᴘᴜᴛɪɴɢ, (**SAC**), 2023          *March 27-31, 2023*

Second author, **Best Paper Award (AI and Agents)**

**A-ColViT: Real-time Interactive Colorization by Adaptive Vision Transformer**          *Washington DC, USA*

AAAI Cᴏɴꜰᴇʀᴇɴᴄᴇ ᴏɴ Aʀᴛɪꜰɪᴄɪᴀʟ Iɴᴛᴇʟʟɪɢᴇɴᴄᴇ (**AAAI**), 2023 Wᴏʀᴋꜱʜᴏᴘ          *February 13-14, 2023*

Second author

**A$^2$: Adaptive Augmentation for Effectively Mitigating Dataset Bias**

*Macau SAR, China*

ASIAN CONFERENCE ON COMPUTER VISION (**ACCV**), 2022

*December 4-8, 2022*

Second author

**Deepfake Detection for Facial Images with Facemasks**

*Nagasaki, Japan*

ACM ASIACCS, WORKSHOP ON THE SECURITY IMPLICATIONS OF DEEPFAKES AND CHEAPFAKES, (**WDC**), 2022

*May 30, 2022*

First author

**Analysis of Obfuscation of Deepfake Images in Differential Privacy Settings**

*South Korea*

KOREAN ARTIFICIAL INTELLIGENCE ASSOCIATION **KAIA**, 2022

*November 17-19, 2022*

First author

## Skills

**Programming**   Python, PyTorch, Tensorflow, LaTeX, R

**Languages**   Korean (Native), English (Fluent) (TOEFL: 102, TOEIC: 975, OPIc: AL), Filipino