Jinhee Lee

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TECHNICAL SKILLS

Programming Languages: Python (Advanced), Java (Intermediate), C++ (Intermediate), MATLAB (Intermediate), C#
Software and Tools: Pytorch, Opencv, Git, Linux, Docker, Unity Engine, Android Studio, Blender, 3ds Max, LaTeX

PROFESSIONAL EXPERIENCE

AI Research Collaborator | Bongseng Memorial Hospital, assigning Stanford University SIMI Computer Vision Lab | Remote **Aug 2024 - Present**

- **Smart Surgeon Collaborative**
  - Conducted quantitative and qualitative model comparison experiments for Segment Anything Models (SAMs) in the neuro-surgical domain
  - Investigated state-of-the-art (SOTA) models for real-time 3D reconstruction from surgical videos

Junior AI Engineer | Lululab | Seoul, Korea **Jan 2022 - Present**

- **Segmentation, Detection, and Classification**
  - Implemented face part segmentation model to recognize each part separately, achieving 75% mIOU
  - Contributed to develop a facial acne segmentation model by supplying additional data via generating fake acne patches using StyleGAN2
  - Developed a seven-segment digit OCR module based on YOLO model to enable automatic blood pressure registration for Digital Therapeutics (DTx) with 92% accuracy, and deployed it for the android environment with quantization
  - Implemented AI-driven personal color analysis model with 85% of accuracy, and developed an demo app
- **Generative AI**
  - Developed facial wrinkle and pigmentation generation module using stable diffusion models with controlnet, and implemented facial disease progression module via image processing in Python and C++
  - Developed face anonymization module based on face landmark recognition module and diffusion models
  - Developed a ChatGPT based Skin Chatbot app. and integrated it with a facial skin analysis system and recommendation systems.
    - Conducted GPT fine-tuning, function calling, RAG, and prompt engineering
- **Recommendation Systems**
  - Designed recommendation systems for cosmetics, skin treatments, and life routines in Java and Python.
    - Implemented full scripts to match user and product properties, which are currently in service
    - Developed a deep learning based cosmetic ingredients analysis module and released it in the Java environment by converting it to ONNX runtime format with quantization

Aircraft Engine Researcher | Korea Aerospace Research Institute | Daejeon, Korea **Feb 2016 - Feb 2018**

- Conducted combustion stability and fuel injector tests for a Scramjet combustor, and implemented image processing and data analysis scripts for laser diagnostic data (PDPA and PLIF)in MATLAB
- Supported wet compression experiments to enhance turbo jet engine compressor efficiency

Research Intern | Korea Aerospace Research Institute | Daejeon, Korea **Jul 2014 - Aug 2014**

- Investigated prior research on wet compression and supported relevant experiments

PROJECTS

Webtoon Character Generation and Classification | Personal Project **2021**

- Developed a webtoon face generation system based on the StyleGAN2-ADA model and implemented a webtoon style classification model for 6 distinct art styles, achieving 95.9% accuracy

Drug Discovery for Alzhimer's disease | Ohio State University **2020**

- Collected chemical compound data from PubChem and converted them to SMILES representation
- Performed data vectorization and implemented regression models to define active chemical compounds for beta-amyloid and tau proteins
  *Project was not fully completed due to Covid-19

Unmanned Aerial Vehicle (UAV) | Inha University **2015**

- Designed rocket-launched UAV with Aerodynamic and Structural analysis, including propulsion and control system design
  - Implemented propulsion system and PID feedback control system using MATLAB
- Created a scaled prototype aircraft with aerodynamic stability control system (Arduino, and C++)

Other Projects

- Kidney tissue cell segmentation in Kaggle - Team Project
  - Implemented various UNet-based architectures, achieving a Dice coefficient of 0.8070
- Created a tutorial on implementing an audio digit recognizer for a class material - Team Project
  - Made a section of 'how to implement NN and train the model in PyTorch'
- Drug Discovery for MoA prediction in Kaggle - Team Project
- Data measurement project involving multiple sensors (pressure, temperature, gyroscope, accelerometer, and GPS) and analyzed data using MATLAB

EDUCATION AND QUALIFICATIONS

Ohio State University | Columbus, OH, USA

M.S. in Computer Science and Engineering | GPA: 3.422/4.0 **Aug 2019 - Aug 2021**

Project: ML based Drug Discovery for Alzheimer's Disease (Project was not fully completed due to Covid-19)

University of Science and Technology | Korea Aerospace Research Institute | Daejeon, Korea

M.Eng. in Aerospace System Engineering | GPA: 4.1/4.5 **Mar 2016 - Feb 2018**

Thesis: Study on the Spray Characteristics of Fuel ristics **Mar**

[**2**] Lee, J., Yoon, H., Kim, S., Lee, C., Lee, J., & Yoo, S. (2024). Deep learning-based skin care product recommendation: A focus on cosmetic ingredient analysis and facial skin conditions. *Journal of Cosmetic Dermatology*, *23*(6), 2066-2077.
[**3**] Lee, J., Lee, S., Lee, K., Kim, J., & Yang, S. (2017). Study on Spray Visualization and Atomization Characteristics of Air-assist Type Injector for Scramjet Engine. *Journal of the Korean Society of Propulsion Engineers*, *21*(5), 88-96.
[**4**] Lee, J., Lee, S., Lee, K., Kim, J., & Yang, S. (2017). Study on the Spray Characteristics of Airblask type injector [Poster Presentation], The *Fall Conference of KSPE 2017*, Busan, Korea

EXTRACURRICULAR ACTIVITIES

Aircraft Mechanic | Republic of Korea Air Force | Gimhae, Korea **Feb 2011 - Feb 2013**

- Ground support and aircraft maintenance service for the E-737 AEW&C
- Honorably discharged after 24 months of service as an Air Force Sergeant

Mentoring | Lululab - Sungkyunkwan University **Apr 2022 - Present**

- Led 9 undergraduate students from Sungkyunkwan university for AI internships
- Mentored 3 AI Projects - Cosmetic Ingredients OCR, Chatbot in Dermatology, and Personal Color Estimation

PATENT

[**P1**] Method and Apparatus for Recommending Cosmetics Suitable for Users Based on the Efficacy of the User's Skin Type and Cosmetic Ingredients, Korean: *10-2022-0079131/10-2450424,* PCT: *PCT/KR2023/008926*