

# Hah Min Lew

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## CAREER OBJECTIVE

My interest is to solve data-driven valuable real-world problems through AI / ML systems, currently based on computer vision and ML engineering. I'm a curious and challenging spirit, and proactively seeking opportunities to grow and share my knowledge.

## EDUCATION

Mar. 2019 - Aug. 2021 M.S. in Electrical Engineering & Computer Science at **DGIST** (GPA: 4.06/4.3)  
 Mar. 2014 - Feb. 2019 Bachelor of Engineering at **DGIST** (Best Project Award)

## EXPERIENCE

**Klleon, AI Researcher** Aug. 2022 - present

- Worked on [digital human projects](#).
- Face & Head Swapping, Neural Talking Head Synthesis, Explicit Controllable 3D Parameterized Modeling.

**MBIS Lab, Graduate Researcher, Advisor: Prof. Jae Youn Hwang** Mar. 2019 - Aug. 2022

- [6 SCIE publications](#), 7 international conferences, 9 projects, 6 patents, and [2 awards](#).
- ML-based anomaly detection for various biomedical applications under multimodal, class-imbalance, and multitask problems.
- Frequency-domain translation for substantial and informative data creation through generative models.
- Developed a novel 1-D time-series signal processing algorithm for the biomedical monitoring system.
- 3D Physical computing for real-world interactable design in medical applications.
- Collaborative research experiences with medical doctors from SNUH, SNUHD, Yonsei Severance, etc.

**LANTERN, Co-founder** Nov. 2016 - July 2017

- Founded a data-driven customized tutor matching service company. Co-working with **Class101**.

## SELECTED PROJECTS

**Finetuning a stable diffusion model for generating high-quality fashion items** [\[Github\]](#)

- Full cycle open source contributions of a fashion dataset creation with a ML-based captioning module, finetuning demo codes, and inferable text-to-image models.
- Used skills: Python, PyTorch, Git, Hugging Face: [\[Model\]](#), [\[Dataset\]](#)

**Construction of a facial action coding system** June 2023 - present

- Photo-realistic facial rendering via explicit controllable 3D parameterized model engineering.
- Used skills: Python, PyTorch, Docker

**Development of a state-of-the-art ML-based head swapping framework** Aug. 2022 - June 2023

- Implementing and reproducing baseline from scratch.
- Full cycle experience from the problem statement, data collection and preprocessing, ML model design, training and evaluation, result serving and improvement.
- Used skills: Python, PyTorch, Git

## SKILLS

Programming [Python](#), [PyTorch](#), [TensorFlow](#), [MATLAB](#) | [Docker](#), [Git](#)  
 Languages Korean (native), English (professional working proficiency)

## SELECTED PUBLICATIONS

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Hah Min Lew, et al., “Towards High-Fidelity Head Swapping with Chroma Keying” [\[Project Page\]](#)

Hah Min Lew\*, J. S. kim\*, et al., “Deep Learning-based Synthetic High-Resolution In-Depth Imaging Using an Attachable Dual-element Endoscopic Ultrasound Probe”, Arxiv Preprint 2023. [\[Paper\]](#)

- Data-centric research and fine-tuning approach for high fidelity ultrasound image translation using generative models.

K. Lee, Hah Min Lew, et al., “CSS-Net: Classification and Substitution for Segmentation of Rotator Cuff Tear”, In **ACCV 2022**. [\[Paper\]](#)

- Developed a multitask network for detection of class-imbalanced regions.
- Employed DFT-based frequency translation for substitution of positive and negative regions.

M. H. Lee, Hah Min Lew, et al., “Deep learning-based framework for fast and accurate acoustic hologram generation”, IEEE TUFFC (IF: 3.267, [Frontal Cover Paper](#)), 2022. [\[Paper\]](#)

- Design autoencoder architecture for unsupervised learning, loss functions for both accuracy and energy efficiency, and physical constraints layers for acoustic hologram generation.

T. C. Cavalcanti, Hah Min Lew, et al., “Intelligent Smartphone-based Multimode Imaging Otoscope for the Mobile Diagnosis of Otitis Media”, Biomedical Optics Express (IF: 3.562, [Spotlight on Optics](#)), 2021. [\[Paper\]](#)

- Diagnosis via ML models (*Multilayer perceptron, Random forest, Logistic regression, Decision trees, Naïve Bayes*) for multimodal human data from clinical trials using standard metrics.

Hah Min Lew, et al., “Ultrasonic Blood Flowmeter with a Novel Xero Algorithm for a Mechanical Circulatory Support System”, Ultrasonics (IF: 4.062), 2021. [\[Paper\]](#)

- Developed a novel signal processing algorithm that complements for conventional flow monitoring methods.

J. Kim, Hah Min Lew, et al., “Forward-looking Multimodal Endoscopic System based on Optical Multispectral and High-frequency Ultrasound Imaging Techniques for Tumor Detection”, IEEE TMI (IF: 11.037), 2020. [\[Paper\]](#)

- Data collection from proposed multimodal imaging of human colon tissues including tumors ex vivo.
- Conducted quantitative analysis of multimode data for tumor characterization.

## AWARDS

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**Outstanding Poster Award** Aug. 2021

- 2021 Student Conference, DGIST

**Outstanding Paper Award** May. 2021

- 2021 Spring Conference, The Korean Society of Medical & Biological Engineering (KOSOMBE)

**Best Project Award** Mar. 2017

- 2016 Undergraduate Group Research Project (UGRP) Program, DGIST

## SCHOLARSHIPS

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**Full Government Scholarships** Mar. 2019 - Aug. 2022

- Full tuition exemptions and stipend for 7 semesters

**Full Government Scholarships** Mar. 2014 - Feb. 2019

- Full tuition exemptions and school expenses supports for 8 semesters