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, SNUDH, 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   Oct. 2023 - present
  - Full cycle open source contributions of fashion dataset creation with a ML-based captioning module, fine-tuning demo codes, and inferable text-to-image models.
  - Used skills: Python, PyTorch, Git | Repositories: [Github], [Model], [Dataset]

Construction of a 3D facial action coding system   June 2023 - present
  - Photo-realistic full-head 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

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

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

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