Hah Min Lew

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CORE VALUES

Data-centric approaches leading to ML systems can solve valuable real-world problems. I value building efficient systems with open-sourcing through agile trials and errors based on a clarified problem. Proactively growing, challenging, and sharing are my core values and attitude toward my life.

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

- Building a data construction pipeline and generative model frameworks for a virtual human dialogue system.

DGIST, Graduate Researcher, Advisor: Prof. Jae Youn Hwang   Mar. 2019 - Aug. 2022

- Multimodal Biomedical Imaging and System Lab (MBIS Lab).
- 6 SCIE publications, 7 international conferences, 9 projects, 6 patents, and 2 awards.
- ML-based anomaly labeling and generative model design for various biomedical applications under multimodal, class-imbalance, and multi-task problems.
- Frequency-domain translation for substantial and informative data creation through generative models.

LANTERN, Co-founder   Nov. 2016 - July 2017

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

SELECTED PROJECTS

Building a virtual human dialogue system pipeline   Aug. 2022 - present
- Contributed to handling multimodal inputs (text, audio, image, etc.) for a virtual human dialogue system.
- Developed a conditional generative model framework to create photo-realistic virtual humans.
- Full cycle construction of from data collection and preprocessing automation pipeline, ML model design, training and evaluation, result serving and improvement.
- Improved generative performance with 2.2 times faster FPS and 64% fewer parameters.
- Used skills: Python, PyTorch, Docker, Git

Finetuning a large text-to-image model with a custom-built dataset maker   Oct. 2023 - Nov. 2023
- Full open source contributions of fashion dataset creation with an ML-based captioning module, finetuning demo codes, and inferable text-to-image models.
- Used skills: Python, PyTorch, Git | Repositories: [Github], [Model], [Dataset]

Smartphone-based image classification for detecting early dental caries   Apr. 2020. - Feb. 2022
- Developed a mobile diagnosis system using multimodal inputs for the classification of dental diseases.
- Used skills: Python, TensorFlow

Multimodal data analysis for the mobile diagnosis of otitis media   Feb. 2020. - Jan. 2022
- Constructed multimodal human clinical data into trainable matrices (up to 4.98 billion pixels).
- Enhanced diagnostic accuracy by a multi-layer perceptron (80%) exceeds that of expert clinicians (73%).
- Used skills: Python, TensorFlow

Multimodal data registration and analysis for tumor/cancer detection   Mar. 2019. - Oct. 2020
- Aligned depth-wise data to corresponding surface-wise data through vector calculations.
- Pixel-wise spectral image classification for tumor characterization (sensitivity: 0.86, specificity: 0.85).
- Used skills: Python, MATLAB

SELECTED PUBLICATIONS

Hah Min Lew*, S. Yoo*, H. Kang*, et al., **"Towards High-Fidelity Head Swapping with Chroma Keying"**, Under Review in **CVPR 2024**.   [Project Page]

- Design a novel foreground-prediction and -aware transformer and augmentation method to improve head swapping performances under a self-supervised training.

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 and fine-tuning approach for high-resolution medical image generation 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 multi-task network for detection of class-imbalanced regions.
- Employed DFT-based frequency translation for substitution of positive and negative regions.

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]

- Image classification via ML algorithms (*Multi-layer perceptron, Random forest, Logistic regression, Decision trees, Naïve Bayes*) for multimodal human data from clinical trials.
- Quantitative analysis 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.
- 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

SKILLS

Programming   🐍Python, 🔥PyTorch, 📉TensorFlow, 📊MATLAB | 🐳Docker, 🔶Git
Languages   Korean (native), English (professional working proficiency)