

# TAE HYOUNG KIM



iMediSync Inc.  
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Machine Learning  
Researcher

Github  
 Blog  
 Youtube  
 Huggingface

## LANGUAGES

**Korean** | native  
**English** | ● ● ●

## HOBBIES

Piano  
 Cooking  
 Drum  
 Weight

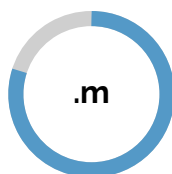
## Education

2015 - 2019 **UNIST**, Electronic Engineering, 1st Major *Bachelor*  
Human Factor Engineering, 2nd Major  
2019 - 2021 **UNIST**, Brain-Computer Interface Lab (BCILAB) *Master*

## Programming



Python  
Pytorch



MATLAB



R



C++  
Arduino

## Projects

2022.04-2022.06

### Real-Time Wav2vec2 for Korean

#### PERSONAL PROJECT

I performed the transfer learning by applying the Korean dataset (Ksponspeech) to the pre-trained (Wav2Vec-xlsr-53) model. A service was established to provide recognition results for real-time voice data. It is available in my Github repository.

**Skills:** NLP, Speech-to-Text (STT), Automatic Speech Recognition (ASR)

2021.10-2022.06

### Prediction model for Depression

#### IMEDISYNC

I made the prediction model for depression using EEG data. After the pre-processing, feature was extracted by background knowledge and selected based on Ensemble based feature importance. SVM model shows accuracy of over 90% in binary classification. Recently, I'm also trying to apply Deep-learning based SOTA models such as EEGNet, Shallow ConvNet etc.

**Skills:** Brain Signal Processing, Feature Extraction and Selection, Deep Learning Modeling, Statistics

## SKILLS

### NLP

Speech To Text (STT)  
Word embedding  
Sentiment analysis

### Machine Learning

Statistical analysis  
Feature extraction  
Feature selection  
Feature visualization  
Classifier modeling  
Apply SOTA models

### Brainwave

EEG / EcoG / Spike  
Experimental design  
Preprocessing  
Resting-state / ERP

### Heart rate variability

ECG / PPG  
Preprocessing  
Normative Database  
Stress detector

2021.03–2021.10

### Denoising Algorithm for HRV

iMEDISYNC

Denoising algorithm for ECG and PPG signal based on Pan-tompkin algorithm. This was adopted as a standard denoising algorithm for over 1,300 data in the company.

**Skills:** Heart Signal Processing

## Research Experience

2021 - Now **iMediSync** AI Research Team

*ML Researcher*

2019 - 2021 **UNIST** Brain-Computer Interface Lab (BCILAB)

*Graduate student*

2018 - 2019 **UNIST** Brain-Computer Interface Lab (BCILAB)

*Research intern*

2017 - 2018 **SNU** Music and Audio Research Group (MARG)

*Research intern*

## Certificates & Grants

2020 Advanced Data Analytics Semi-Professional (ADsP)

*Korea*

## International Conference and Exhibition

2019 *Society for Neuroscience (SfN)*, Chicago.

2022 *CES Show*, Las Vegas.

## Publication (SCI / SCIE)

2022 **iSyncWave: dry sensor-based multipurpose EEG device with potential to replace wet sensor-based EEG devices**

FRONTIERS IN NEUROIMAGING

Under Review

2022 **Prediction model for Depression using sex and age-matched EEG biomarker**

FRONTIERS IN PSYCHIATRY

Under Revision

2022 **Decoding Imagined Musical Pitch from Human Scalp Electroencephalogram**

IEEE TNSRE

Under Review

2021 **Cortical representation of musical pitch in event-related potentials**

COGNITIVE NEURODYNAMICS

Under Revision