MYOUNGCHUL KIM

Data Scientist

@ kmc8907@gmail.com
troopl.com/kmc8907

J 080-9801-7956 **D** 0000-0002-8624-5564

Greater Tokyo, Japan

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PROJECTS

Search for Ultra-high Energy Neutrinos from Askaryan Radio Array (ARA) by Template Method 🔗

International Center for Hadron Astrophysics (ICEHAP)

- Classified astronomical signal by statistical-oriented Principal Component Analysis (PCA), after obtaining features from 2 billion amounts (~200 TB) of radio-frequency data that measured below the South Pole.
- Implemented automation solutions for utilizing large CPU & GPU clusters by building Python & C++ packages to streamline data analysis workflows and enhance productivity.
- Implemented physics techniques, such as the Fast Fourier Transform (FFT), Interferometry, and the Matched Filter, into the package for feature extraction.
- Optimized the PCA based on Frequentist Statistics and Pseudo Experiment.
- Analyzed & quantified result by calculating statistical significance, including systematic uncertainty, and Monte Carlo simulation.

Sound to Symphony (Al Music Generation) & Le Wagon Data Science & Al Bootcamp

- ☐ January 2024 March 2024
- Le Wagon, Tokyo
- Generates completely new music by Recurrent Neural Network (RNN) that can be easily customizable by musical software
- Architectures RNN model for learning musical patterns from large classical music datasets that are expressed in numerical format.
- Deplyed the project into the Streamlit by utilizing FastAPI
- Built the connection between generated music and musical software Abelton

EXPERIENCE

Graduate Research Assistant Chiba & SungKyunKwan University

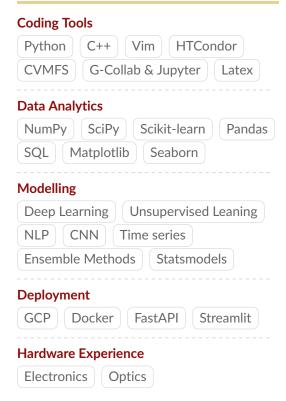
2015 - 2023

- Japan & South Korea
- Performed high-precision calibration for the radio-frequency antenna for an advanced research instrument.
- Established **scientific Python & C++ hybrid package**, inspired by C++-based code, that extracts physics results from raw data which has led to **wildly use by international collaborators**.
- Learned large database management, including optimization of data sourcing and efficient connection to supercomputer by using solid analysis pipeline.
- Practiced a thorough way to evaluate the project results by using statistical techniques and the back of the envelope calculation.

ABOUT ME

I'm an Astrophysicist used to analyzing large datasets to find astronomical signals and recently graduated from Le Wagon Data Scientist & AI boot camp. Seeking to utilize programming skills backed by my scientific background and data science knowledge.

TECHNICAL SKILLS



LANGUAGES

English	Fluent
Japanese	JLPT N1, Fluent
Korean	Native

INTERESTS

Classical Music
Orchestra Contrabass
Universe Fourier Transform

Teaching & Operating Assistant Chiba & SungKyunKwan University

- **1** 2015 2018
- Japan & South Korea
- Guided Korean students are transitioning to undergraduate studies at Japanese universities by teaching freshman-level physics and mathematics courses in Japanese.
- Provided mentorship to students, aiding them in achieving academic success in challenging physics courses. Conducted handson physics experiments with students, enhancing their practical knowledge and skills. Managed scientific equipment to ensure smooth and successful experiment execution.

Japanese to English & Korean Translator

Wovn.io

2018

Tokyo

 Provided translation services and real-time deployment for the client company website written in Japanese, incorporating cultural nuances to enhance readability and accessibility.

EDUCATION

Data Science & Al Bootcamp Le Wagon

- 📋 January 2024 March 2024
- Japan
- Thorough study in Python for Data Science, with expertise in data extraction, manipulation, and visualization, backed by a strong foundation in statistics and linear algebra.
- Delving into Machine Learning and Deep Learning, with practical application in building comprehensive workflows utilizing Scikit-Learn and designing neural network architectures.
- Proficiency in ML Engineering, involving the development of Python packages for large-scale data tasks in GCP, and a deep awareness of the ethical considerations surrounding AI deployment

Completion of Ph.D. program, Physics Chiba University

- 🗖 April 2017 December 2023
- Japan
- Research topic: Search for Ultra-high Energy Neutrinos Using Eight Years of Data from Two ARA Stations by the Neutrino Template Method

Master of Science, Physics

SungKyunKwan University

- March 2015 February 2017
- South Korea
- Thesis title: Performance study of camera system for the IceCube-Gen2 detector

Bachelor in Science, Physics

SungKyunKwan University

March 2011 - February 2015

South Korea

AWARDS



Japanese Government Monbukagakusho Scholarship (MEXT) Graduate Research Assistant in Ph.D., 2017 – 2020



Teaching Assistant (T.A.) of Korea & Japan Joint Government Scholarship Teaching Assistant for a freshman Korean students, 2017 – 2018



BK21+ Research student scholarship Graduate Research Assistant in Msc., 2015 – 2017



Operating Assistant scholarship
Physics Experiment Assistant, 2016 –
2017



CK Research student scholarship Research Assistant in Bsc., 2014

SELECTED PUBLICATIONS

Journal Articles

- P. Dasgupta, M. S. Muzio, et al., "Progress Towards a Diffuse Neutrino Search in the Full Livetime of the Askaryan Radio Array," PoS, vol. ICRC, p. 1226, 2023.
- M. Kim et al., "Enhanced Ultra-High Energy Neutrino Search at the Askaryan Radio Array using Template-based Techniques," PoS, vol. ICRC, p. 1148, 2023.