Elias Firisa

github.com/EliasSf73 eliasfirsa@kaist.ac.kr eliassfirisa@gmail.com leetcode.com/u/Abdiisf/

Education

Korea Advanced Institute of Science and Technology (KAIST) February 2022 – Present

B.S. in Brain and Cognitive Science, Minor in AI

- **Completed coursework**: Intro to Linear Algebra, Probability and Statistics, Statistical Machine Learning, Engineering Statistics, AI and the Brain, Signals and Systems, Data Science, Systems Neuroscience, Cognitive Neuroscience, Discrete Mathematics, Data Structures, Human Brain Anatomy and Physiology Lab, Biology of Neurons, Methods in Brain and Cognitive Sciences, General Physics I, General Physics II, Calculus
- **Current coursework(Spring 2025)**: Machine Learning, Experimental Data Analysis and Modeling, Bio-Signal Processing, Theoretical Neuroscience, Computational Neuroscience

Experience

Brain-Machine Intelligence Lab (Prof. Sang-wan Lee) — KAIST - Lab Website

Undergraduate Researcher *Feb 2024 –Nov 2024*

- Developed expertise in generative models by implementing Variational Autoencoders (VAEs) focused on facial recognition tasks using the CelebA dataset
- Engaged in pioneering research focused on integrating concepts of predictive coding within deep learning frameworks to enhance machine understanding of cognitive processes

Decision Brain Dynamics Lab (Prof. Jaeseung Jeong) — KAIST - Lab Website

Research Intern *December 2024 – Present*

- Conducted a study on neurophysiological and clinical fundamentals of Parkinson's disease
- Applied machine learning algorithms to classify Parkinson's disease datasets, achieving data-driven insights into disease patterns
- Analyzing frontal lobe EEG patterns using power spectrum and machine learning techniques to measure stress and emotional states

Data Strategy Lab — KAIST - Lab Website

Research Internship *March 2024 – May 2024*

- Reviewed and analyzed research papers on metrics for text summarization, information retrieval, and sentiment analysis using AI-based methods.

Leeds Worm Lab (Prof. Netta Cohen) — University of Leeds - Lab Website

Research Intern *June 2024 - August 2024*

- Conducted research on time series forecasting using Duffing oscillator dynamics, leveraging nonlinear dynamical models to predict chaotic systems.
- Extended work into prediction of neural activity by applying the time series forecasting models-such as DLinear- to C.elegan's neural dataset.

Tutor — KAIST September 2024 - Present

- Providing tutorials for fundamental courses such as General Biology to freshman students
- Coaching advanced subjects such as Linear Algebra, Probability, Statistics, and Neuroscience to non-freshman students

Projects

Variational Autoencoder with CelebA | Project Link

- Developed a Variational Autoencoder for the CelebA dataset to generate high-quality facial images and explore latent space representations.

Student Grade Classification Project | Project Link

- Accomplished development of a machine learning model to classify student grades as measured by model accuracy, by analyzing academic and demographic data.

RAG Pipeline

- Designed a Retrieval-Augmented Generation (RAG) pipeline specifically tailored for Financial Question Answering Corpus.

Integrated Statistical and Survival Modeling of Glioblastoma Outcomes

- Identified significant glioblastoma treatment effects ($p \leq 0.05$, $HR \leq 0.8$) as measured by one-/two-way ANOVA with Tukey HSD and Kaplan–Meier/Cox survival modeling on 150+ preclinical experiments and 200+ clinical patient records

Parameter Estimation: Optimization of Lotka–Volterra Dynamics

- Optimized predator–prey ODE parameters to fit empirical data using grid search, Nelder–Mead and simulated annealing, minimizing model–data error

Web3-Based Freelance Marketplace | Project Link

- Accomplished creation of a Web3-based freelance marketplace as measured by user engagement metrics, by connecting freelancers and clients through a decentralized platform and received 1st place award.

Skills

Programming Languages: Python, Java,MATLAB, HTML & CSS
Machine Learning Tools: Numpy, Pandas, Scikit-learn,Pytorch
Data Visualization: Matplotlib,Seaborn
Statistical Analysis, Data Modeling

Languages

English: Fluent
Korean: Elementary
Afan Oromo: Native
Amharic: Native

Awards and Achievements

Top Project for Web3 and Blockchain Competition(Spring 2023)
KAIST Alumni Scholarship (2024) Award
INSEO Scholarship (2023) Award