HENG-LE CHEN

Work Authorization Status: U.S. Citizen
| chen.hengle@u.yale-nus.edu.sg | https://github.com/heng-le | https://heng-le.github.io |

EDUCATION

Yale-NUS College **Aug 2021 – May 2025**
Bachelor's Degree (Honors), Major in Computer Science, Minor in Life Sciences *Singapore*
- GPA: 4.84/5.00
- Co-Curricular Activities: Yale-NUS Hacks, Yale-NUS Swimming, NUS Pawfriends

PROFESSIONAL EXPERIENCE

Yale University – Gerstein Lab **Sep 2023 – May 2024**
Research Assistant *New Haven, CT*
- Contributed to a project to define roles of rare variants and structural variants towards gene regulation using the EN-TEx personal epigenome resource.
- Modified the ENCODE ChIP-Seq pipeline to accommodate mapping to personal genomes (i.e. alt-aware mapping) and assisted in adapting the ChIP-Seq datasets for use in machine learning models to predict the regulatory effects of structural variants at a tissue and cell-type specific level.
- Employed Python and Bash scripting for data preprocessing, pipeline automation, and visualization, improving data processing efficiency by 25%.

Life Edit Therapeutics **June 2024 – Aug 2024**
Computational Biology Intern *Durham, NC*
- Collaborated with wet lab scientists to analyze next-generation sequencing (NGS) data, refining experimental protocols and validating computational predictions to accelerate research outcomes.
- Developed and optimized deep learning models with PyTorch for predicting base editing efficiency, achieving a 90% reduction in loss and a 75% increase in R^2 across diverse datasets.
- Contributed to library design for high-throughput base editing experiments, enhancing the scalability and precision of targeted editing workflows.

Blenman Innovation Group **May 2023 – Aug 2023**
Research Assistant *New Haven, CT*
- Designed and implemented a framework for proteomics analysis and visualization, using R and Python to streamline workflows and improve interpretability for researchers.
- Developed interactive and customizable visualizations for biological pathways, integrating omics data to enhance clarity and user engagement.
- Applied natural language processing techniques to automate the inference of protein functions and contextual associations, collaborating with database resources like UniProt.

The Ecological Adaptations Lab **May 2022 – Jan 2023**
Research Assistant *Singapore*
- Revamped Yale-NUS College Insectary Lab's MySQL database, enhancing data integrity and efficiency by eliminating duplications and updating missing data points, thereby improving accuracy and facilitating streamlined data retrieval.
- Conducted comprehensive spectroscopy and DNA analyses on a variety of insect specimens, and performed data preprocessing techniques for machine learning models, utilizing DeepLabCut for machine learning-based analyses.
- Created custom Python and R scripts for sophisticated visualization of spectroscopy, PCR, and DNA sequencing data.

PERSONAL PROJECTS

Generalizing Bloom Filters for Efficient K-mer Encoding **Sep 2024 – Present**
Yale-NUS College – Honors Thesis *Singapore*
- Independent research project exploring the use of generalized Bloom filters for reducing memory usage in encoding k-mers from large genomic datasets.
- Compared the performance of the optimized Bloom filters with traditional methods, focusing on memory consumption, false positive rates, and retrieval accuracy for large reference genomes.

Brain Tumor MRI Classification **Jan 2024 – May 2024**
Yale-NUS College *Singapore*
- Developed a machine learning pipeline for classifying brain tumors in MRI scans, and deployed it as a Telegram bot, enabling real-time tumor classification from MRI scans through user-friendly chat-based interaction.
- Designed and implemented various neural network models with transfer learning to automatically detect and classify tumors based on MRI features, achieving a classification accuracy of 92% across multiple tumor types.