Richard Chen

(949)656-6309 | ysc283816@gmail.com | github.com/YuShuRChen | yushurchen.github.io

Education

University of California, San Diego **La Jolla, CA**
B.S. in Computer Engineering, Minor in Cognitive Science *June 2024*
Relevant Courses: Data Science in Practice, Artificial Intelligence: Search and Reasoning, Machine Learning, Deep Learning, Computer Vision, Statistical Natural Language Processing, Recommender Sys & Web Mining, Image Processing, Neurobiology of Cognition, Neuroanatomy and Physiology, Systems Neuroscience, Neural Data Science, Brain Computer Interfaces

Experience

Undergraduate Research Assistant **Spring 2024 - Present**
UCSD Kastner Research Group *La Jolla, CA*
- Updated Sherlock from Python 3.8 to 3.10
- Packaged Sherlock for integration with HoLmeS.
- Ran Sherlock across various datasets to benchmark its performance
- Prototyped enhancements to Sherlock to increase its accuracy and adaptability

Undergraduate Research Assistant **Spring 2023 - Fall 2023**
UCSD WukLab *La Jolla, CA*
- Constructed a retrieval API in Python that, given search terms, efficiently delivers pertinent information from the Wikipedia dump sourced from KILT
- Built a simulator that mimics the outputs of the various APIs to test the system's functionality and performance
- Created a dataloader that efficiently preprocesses different datasets using their respective preprocessing methods and recomposes them

CSE Undergraduate Tutor **Spring 2023**
UCSD CSE Department *La Jolla, CA*
- Tutored over 400 students enrolled in Advanced Data Structures, explaining challenging concepts to them
- Assisted students with their programming assignments and projects in C++ during biweekly lab hours

Undergraduate Research Assistant **Spring 2021 - Spring 2022**
UCSD Translational Neuroengineering Lab *La Jolla, CA*
- Labeled sessions of zebra finch behavior based on analysis of audio waveform and spectrogram data

Research Works/Publications

Andy Meza, Yu-Shu Chen (2025) Computer Vision For Primate Identification
Andy Meza, Yu-Shu Chen, Chima Tochukwu Nwughala (2024) HoLmeS: Design Space Exploration for High-Level Synthesis
Yu-Shu Chen, Andy Meza (2024) Interpretable Spiking Neural Network For Basic Mathematical Operations
Yu-Shu Chen (2024) Study on Large Language Models' Ability To Do Basic Math Operations in Different Bases

Projects

Embedded System Design Project **Spring 2024**
CCL-ML Primatology Pipeline *Python, Blender, TensorFlow, OpenCV, YOLOv8*

- Collaborated with a team of three to develop an automated system capable of detecting primates in video frames, predicting the pairwise proximity/distance between detected primates, and identifying all detected primates
- Developed Blender scenes recreating a macaque sanctuary of Born Free USA's and generated over 30,000 images from the scenes
- Adapted YOLOv8 models for deployment on Raspberry Pi and managed Python environments on the device
- Integrated a Google TPU onto the Raspberry Pi to enhance the processing capabilities of the device

Deep Learning **Spring 2023**

Taxi Travel Time Prediction *Python, PyTorch, BERT (language model)*

- Collaborated with a team of three to train deep learning models to predict how long taxi trips will take
- Preprocessed and analyzed the dataset for training using Python NumPy and pandas
- Trained deep learning models (MLP, LSTM) to make predictions
- Fine-tuned the BERT model to make predictions

Neural Data Science **Spring 2023**

Cross Dataset Eye State Prediction *Python, EEGLAB, MNE-Python*

- Collaborated with a team of three to train machine learning models to classify whether data points from electroencephalogram recordings are recorded when participants have their eyes opened or closed
- Combined and visualized datasets from EEGLAB .set files and .csv files using MNE-Python and pandas
- Trained classifiers (LinearSVC, SGDClassifier, MLPClassifier, etc.) to classify the datapoints

Principles of Computer Operating Systems **Spring 2023**

The Nachos Instructional Operating System *Java*

- Developed the key components of the NachOS in Java, including Threads, Processes, Multiprogramming, and Virtual Memory

Brain Computer Interfaces **Winter 2023**

EEG Motor Movement/Imagery Classification *Python, EEGLAB, MNE-Python*

- Trained machine learning models to do motor movement/imagery classification tasks that classify between left and right fists, both fists and both feet, and between all four classes
- Used MNE-Python to read EEGLAB .set files from an OpenNeuro dataset and visualize the data
- Preprocessed data by baseline correcting, epoching, filtering, and performing independent component analysis
- Trained support vector machines to perform the classification tasks

Project in Computer Archetiecture **Winter 2023**

Encoding-Decoding CPU *SystemVerilog, Python*

- Designed a custom processor that supports project-specific forward error correction tasks, while meeting the project-specific ISA requirements
- Designed the processor using SystemVerilog and implemented the corresponding assembly code for the tasks
- Built a processor to debug the assembly code and a compiler to translate the code into binary code using Python

Data Science in Practice **Winter 2022**

Mental Disorder and Demographic Factors in Fatal Overdose *Python, NumPy, pandas, Matplotlib, seaborn*

- Conducted in-depth analysis of CDC data to assess the impact of various variables on fatal overdose incidents
- Cleaned and analyzed the data using NumPy and pandas
- Presented findings through visualizations created with Matplotlib and seaborn

Software Engineering **Winter 2022**

Birds of a Feather *Java, Android Studio, JUnit*

- Collaborated with a team of seven to develop an application that helps students find classmates from prior classes
- Created the app for Android devices using Android Studio
- Stored user information locally using the Room database
- Tested the application extensively using Java's JUnit, Robolectric, and Espresso

Saddleback College Advanced Topics in Java for Computer Science **Spring 2020**

Tic Tac Toe Game *Java, JavaFX, MySQL*

- Collaborated with a team of three to build a Java-based tic-tac-toe game featuring AI and multiplayer capabilities
- Designed the frontend interfaces for the game using JavaFX
- Developed AI game logic to support single-player mode
- Stored user game history locally using MySQL

Skills

Computer: C, C++, Java (Standard Libraries, Android API, JUnit), Python (Matplotlib, MNE-Python, NumPy, pandas, PyTorch, scikit-learn, TensorFlow), Assembly (ARM, MIPS), Linux

Languages: English, Mandarin, Spanish, Japanese