KAI M. HUNG

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EDUCATION

B.A. in Mathematics & Computer Science **GPA: 3.92**

Rice University

Aug 2020 – May 2024 | Houston, TX

- Minor in Statistics
- **Coursework:** Distributed ML & Optimization, ML with Graphs, Statistical ML, Operating Systems, Algorithms & Data Structures, OOP Design
- **Awards:** Cornell, Maryland, Max-Planck Pre-Doctoral Research Fellowship, Southern Regional Statistics Undergraduate Fellowship

EXPERIENCE

ML Research Assistant

Courant Institute, New York University

May 2023 – Ongoing | New York City, NY

- Improving optimal transport methods for factor discovery with applications to **machine learning fairness** and **personalized ML for healthcare** under Dr. Esteban G. Tabak at the NYU Courant Institute.
- Implementing neural network-based method using PyTorch for conditional density estimation for interpretability of high-dimensional data.
- Formulating fairness-inducing machine learning paradigms through OT-based regularizers to penalize dependence on sensitive attributes.

Skills: PyTorch, Scikit-Learn, Scipy, SymPy, NumPy, Matplotlib, Git

ML Research Assistant

OptimalEnsemble Lab, Rice University

Aug 2022 – Ongoing | Houston, TX

- Building an optimal transport-based **topological data analysis toolkit** for collaborating biologists to predict disruptions to Sub-Saharan Food Web networks by human intervention activities under Dr. César A. Uribe.
- Devised a method to predict high-influence substructure within a set of food web networks to inform human activity impacts in Africa.
- Implemented a **graph factorization** algorithm capable of separating simple network structures (e.g. cycle and star graphs) with **92% accuracy**.
- Created interactive visualizations of 170 food web networks hosted on a browser for ease of model result interpretations.

Skills: Python, POT, NetworkX, Scikit-Learn, GeoPandas, PyVis, Git

Software Engineer

RiceApps

May 2021 - Ongoing | Houston, TX

- Build **Rice Carpool**, a ride-sharing web app for Rice University students, using **ReactJS**, **GraphQL**, and **MongoDB**.
- Implemented ride creation and user onboarding features, **servicing 933 users on a 4000-student campus with 868 successful ride matches**.
- Assisted fellow developers with feature development, bug fixes, and user testing during the weekly sprint and scrum sessions.
- Handled 32 out of 164 total tickets submitted year-round, accounting for 20% of development activities across the entire app.

Skills: React, JavaScript, CSS, HTML, GraphQL, MongoDB, NodeJS

PROJECTS

Rice Carpool A ride-sharing app for Rice University students to schedule rides with one another. Built with ReactJS.

Connect the Dots A Graph Neural Network (GNN) model for edge prediction using a Bill.Com client network with 84% accuracy. Built with PyTorch and Scikit-Learn.

Yalnix An operating system kernel for the simulated Rice Computer Systems hardware. Built with C independently in two weeks.

Arxiv Analyzer Implemented the PageRank algorithm for analyzing 5000 papers from the Arxiv paper archive fully in SQL.

Text Document Classifier Built a TF-IDF-based text classifier on 170,000 court case documents using Python, PySpark, and AWS.

Automated Test Grader Built a 2500-line object-oriented auto test grader using Java.

LEADERSHIP

Head Peer Academic Advisor

- Lead a team of 12 peer academic advisors to provide academic and career planning services to ∼300 students at a residential college.
- Led a team of 30+ upperclassmen to curate a 67-page academic guide spanning more than 50 majors at Rice University, complete with personalized upperclassmen advice and popular student org recommendations.

Secretary, Vietnamese Student Association

- Managed monthly club newsletter and documented meetings to facilitate efficient operations within the club.
- Oversaw logistics for events such as the Rice Lion Dance performance for Lunar New Year and the End-of-Year banquet.

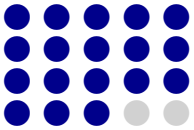
SKILLS

Python | C | JavaScript | SQL | R | Java | HTML | CSS | Linux

PyTorch | Tensorflow | Scikit-Learn | React | GraphQL | PySpark | AWS

LANGUAGES

English
Mandarin Chinese
Cantonese Chinese
Japanese



Teaching Assistant

Rice University

Aug 2021 - Dec 2022 | Houston, TX

- Taught two semesters of proof-based Probability & Statistics and one semester of Advanced Algorithms & Data Structures.
- Explained complex algorithmic and mathematical topics including dynamic programming, network flow, randomized algorithms, and computational complexity to 292 students over weekly office hours and Piazza.
- Verified and created exam problem solutions.
- Scored and provided feedback on students' exams and homework.
- Hosted weekly lab sections to teach data science with R.

AI Research Intern

Berkeley AI Research, University of California, Berkeley

Jun 2022 - Aug 2022 | Berkeley, CA

- Prototyped **reinforcement learning** models for cloning human participant actions in an approach-avoid game under Dr. Alison Gopnik.
- Implemented a pythonic model pipeline for parameter estimation of human subject policies divided across age groups (inverse reinforcement learning) via maximum likelihood estimation.
- Developed Q-Learning model capable of learning differential responses between children and adults regarding an object's pattern and color; achieved **55% performance improvement** over the baseline model.

Skills: Python, NumPy, Matplotlib, Jupyter Notebook

Bioinformatics Research Intern

MD Anderson Cancer Center

Jun 2021 - Aug 2021 | Houston, TX

- Conducted RNA-sequencing analysis to identify causal factors for treatment response discrepancy in Tongue vs. Flank mEER tumors using R to improve HPV+ Cancer immunotherapy under supervision of Dr. Jagan Sastry and Dr. Venkatesh Hegde.
- Identified 485 differential expressed genes and 4 biological pathways contributing to 54% sustained tumor regression in anti-PD1 immunotherapy treatment.

Skills: R, BioConductor, DeSeq2, Tidyverse