WEI-CHIH HUANG

Email ◇ Linkedin ◇ Github ◇ Personal Website

EDUCATION

PhD in Physics, Texas A&M University, US — August 2019 - June 2025 (expected)
BS in Physics, National Tsing Hua University, Taiwan — August 2015 - June 2019

PROJECTS

Aggie Job Referral - Django, SQLite, PostgreSQL, Heroku, Bootstrap — website

- Built a referral website to reduce the time of networking by 40%
- Deployed to Heroku with specially designed PostgreSQL database schema to save the disk space by 20%

PyBigstick - NumPy, Pandas, Matplotlib, Streamlit, Docker — github

- Save 95% of time writing input scripts for BIGSTICK (Large Scale Nuclear Shell Model Code)
- Analyze any nucleus and predict experimental outcomes with at least 60% accuracy
- Created an interactive data dashboard with Streamlit
- Virtualized the app with Docker to run on any machine

Pro Cyclists Race Analysis - NumPy, Pandas, SciPy, BeautifulSoup, scikit-learn, XGBoost, Pytorch — github

- Implemented high performance multi-threading web scraping script by BeautifulSoup (5 times faster than the default)
- Preprocessed the data (clean, format, normalize) with NumPy, Pandas, SciPy, and scikit-learn
- Used scikit-learn, XGBoost, and Pytorch to build linear, RF, DNN, RNN models and predict the race outcome, which is 20% better than a trivial model

Curve Fitting GUI - SciPy, NumPy, Matplotlib, PyQT — github

- User friendly graphical user interface tool for curve fitting

RESEARCH EXPERIENCE

Inelastic Neutrino/Dark Matter - Nucleus Scattering by BIGSTICK — arxiv

- Parallelized and compiled BIGSTICK with MPI/OpenMP in computer cluster
- Virtualized BIGSTICK with Docker to resolve the incompatibility with the cluster
- Did the statistical analysis on the multi-dimensional outputs by Python and Mathematica
- Published a paper and present several successful talks at workshops slides, slides

Searching for Axions in High Energy Physics Experiments — arxiv

- Construct analytical models for axion (a theoretical particle) in the experiments
- Modularized and automated the statistical analysis

Inflation and Late-time Acceleration in a New Gravity Theory

- Created time-dependent partial differential equations to describe the features of the universe
- Programed Mathematica and Python to stimulate and visualize the evolution of the universe

Dark Matter in Merging Galaxies

- Automated the analysis process of dark matter near a galaxy with CASA (data processing software for radio telescopes arraies, written in IPython)
- Presented a talk at workshop slides

Application of Deep Learning in AdS/CFT — text

- Integrated deep learning with Ads/CFT (a well-known theory in high energy physics)

Coherent Elastic neutrino-nucleus Scattering (CEνNS): Sterile Neutrino Search

- Construct a statistics model for sterile neutrino.

PUBLICATION

- Inelastic nuclear scattering from neutrinos and dark matter arxiv
  Bhaskar Dutta, ***Wei-Chih Huang****, Jayden L. Newstead, Vishvas Pandey*
- Axion-Like Particle Production at Beam Dump Experiments with Distinct Nuclear Excitation Lines arxiv
  Loyd Waites, Adrian Thompson, Adriana Bungau, Janet M. Conrad, Bhaskar Dutta, ***Wei-Chih Huang****, Doojin Kim, Michael Shaevitz, Joshua Spitz*

EXTRA-CURRICULAR ACTIVITIES

- Project Manager at Aggie Coding Club Feb - Nov 2022
- Data Science Ambassador representing Physics Department at Texas A&M 2022 - 2023

HONORS AND AWARDS

- **Three Years Tsing Hua University Scholarship (2% acceptance rate)** 2015 - 2018
  Tuition wavier plus accommodation and textbooks subsidy
- **Undergraduate Research Scholarship** Fall 2018
  The scholarship for the New Gravity Theory
- **Data Science Ambassador Scholarship** 2022 - 2023
  Data Science Ambassador Scholarship Program at Texas A&M Institute of Data Science

TEACHING EXPERIENCE

- **Teaching Assistant** *Texas A&M* Thermodynamics and Statistical Mechanics Fall 2019
- **Teaching Assistant** *Texas A&M* Electricity and Magnetism for Engineering and Science (Lab) Summer 2020
- **Teaching Assistant** *Texas A&M* Newtonian Mechanics for Engineering and Science Spring 2020 - present
- **Teaching Assistant** *Texas A&M* Electricity and Magnetism for Engineering and Science Fall 2020 - present