Jonathan Guiang

Physicist, Programmer, Data Analyst

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Education

UC San Diego — San Diego, CA
PhD. in Physics; GPA: 3.76 — *Sep. 2019 – Present*

- **Dissertation**: N/A
- **Relevant Coursework**: Mathematical Methods in Physics, Classical Mechanics, Computational Physics
- **Awards**: Physics Excellence Award

UC Santa Barbara — Santa Barbara, CA
B.S. in Physics; GPA: 3.73 — *Sep. 2015 – June. 2019*

- **Thesis**: MTD Simulation and Search for Rare Higgs Decays
- **Awards**: Highest Academic Honors, Research Excellence Award, Distinction in the Major

Fellowships

Sloan MPDH Scholar: Named an Alfred P. Sloan Foundations Minority Ph.D. (MPHD) Scholar in 2019-20.

Experience

CERN-HEP Software Foundation — San Diego, CA
Student Developer — *May 2019 – Aug. 2019*

- **CMS Data Access**: Developed open source software for CERN-HSF with funding from Google Summer of Code. Produced a set of tools for cleansing, extracting, and visualizing cache access pattern data. Analyzed and presented insights provided by these tools in order to demonstrate their effectiveness.

UC Santa Barbara — Santa Barbara, CA
Undergraduate Student Researcher — *Dec. 2016 – Jun. 2019*

- **Rare Higgs Decay Analysis**: Measurement of $H \to \rho/\phi + \gamma$ decays using events from a sample of proton-proton collisions collected with the CMS detector, where anomalous decay rates would indicate existence of new physics. Designed and implemented this novel analysis from the ground up using a numpy/pandas framework.
- **MIP Timing Detector (MTD)**: Developed software for optimizing the design for the MTD to be constructed for the HL-LHC. Used simulated particle kinematics in addition to a tunable OpenSCAD 3D model of the sensor layout to simulate the efficiency of the detector in direct collaboration with the team responsible for its construction.
- **AutoDQM**: Conceptualized, designed, and implemented a statistical tool for data quality management with an online graphical interface for ease of use. Collaborated with a computer science student in Switzerland to further improve the platform and market it to other research groups.
- **MilliQan**: Characterized the single-photoelectron (SPE) response of photomultiplier tubes used in the MilliQan experiment demonstrator under the direction of a graduate student, working closely with another undergraduate. Developed software for simulating SPE responses.

Projects

Integratable: A public tool that provides useful integrals on an interactive, modern platform. Uses a React-based frontend, evaluates known definite integrals using Javascript mathematics functions.

ChompChapp: Made for the SB Hacks V Hackathon and selected as one of the top six projects of the event. Made intelligent restaurant suggestions based on subconscious user preference. Javascript/JQuery webpage served by Flask/Celery on a Redis server. Powered by a Python backend with Tensorflow and Keras machine learning models.

Skills

Languages: Python, Javascript, C/C++, Matlab

Technologies: ROOT, Pandas, XGBoost, React, JQuery, Flask, Docker, Spark SQL, OpenSCAD, HTML, CSS