Jonathan Guiang

Physicist, Programmer, Data Analyst

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Education

UC San Diego — San Diego, CA
PhD. in Physics; GPA: None — *Aug. 2019 – Present*

- **Thesis Topic**: N/A
- **Relevant Coursework**: N/A
- **Fellowships/Awards**: Sloan Scholar Fellowship, Physics Excellence Award

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

- **Relevant Coursework**: Particle Physics, Analog Electronics, Quantum Mechanics, Electromagnetism, Advanced Classical Mechanics, Linear Algebra, Complex Analysis
- **Awards**: Highest Academic Honors, Research Excellence Award, Distinction in the Major

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 analysis framework.
- **MIP Timing Detector**: Developed software for optimizing the design for the MIP Timing Detector to be constructed for the HL-LHC upgrade. Used simulated particle kinematics in addition to a tunable OpenSCAD 3D model of the sensor layout to measure the efficiency and other response characteristics 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. Continued collaboration with another 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.

Publications

Bachelors Honors Thesis: https://jkguiang.github.io/thesis-undergrad/

Skills

Languages: Python, Javascript, C++, Matlab

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