

Jonathan Guiang

Physicist, Programmer, Data Analyst

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 [jonathanguiang.com](https://github.com/jkguiang) |  github.com/jkguiang |  [/in/jonathanguiang/](https://in/jonathanguiang/)

EDUCATION

UC San Diego

San Diego, CA

PhD. in Physics; GPA: None

Aug. 2019 – Present

- **Research Interests:** Search for new physics by studying data from proton-proton collisions at the CMS detector at the LHC. Optimization of CMS data storage and retrieval infrastructure in anticipation of the HL-LHC upgrade.
- **Relevant Coursework:** Methods in Experimental Physics, Quantum Field Theory, Statistical Mechanics
- **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 a set of tools for cleansing and extracting access pattern data. Put in place a modeling framework for predicting the access patterns within an alternate data access infrastructure. Funded by Google Summer of Code 2019 program.

UC Santa Barbara

Santa Barbara, CA

Undergraduate Researcher

Dec. 2016 – Jun. 2019

- **Rare Higgs Decay Analysis:** Measurement of $H \rightarrow \rho/\phi + \gamma$ 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, OpenSCAD