Dr. Giordon Stark — "jack of all trades, postdoc of one"

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in Giordon Stark

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Publication list (500+ papers)

curriculum vitae

Summary

- Particle physicist on the ATLAS detector at CERN looking to transition to the private sector.
- "Big data scientist" analyzing petabytes of collisions for signs of new physics.
- Passionate about building reusable, robust, containerized data analysis pipelines, creating actionable data products, and developing software to improve user experience.

⟨⟩ Highlighted Projects

 \forall pyhf— statistics GPU numpy scipy tensorflow jax pytorch auto-diff

Created a python-only hypothesis testing framework which speeds up asymptotic statistical fits by a few orders of magnitude, using tensor algebra libraries such as jax and pytorch.

 \forall GitLab CI/CD Training—(gitlab)(tutorial)(continuous integration)(python)(C++)

Produced a three-hour tutorial using GitLab CI/CD with closed-captioned YouTube videos aimed at teaching physicists how to develop testable and reproducible analyses.

▼ itkdb— (python) (betamax) (requests) (unit tests) (integration tests) (mongodb)

Developed a user-friendly python interface to a quasi-RESTful API used to register, test, and ship millions of detector components for the ATLAS detector upgrade in 2028. This speeds up custom tooling needed by third-party vendors for interacting with the database.

▼ gFEX— FPGA firmware embedded OS cross-compilation

Collaborated with a team of physicists and engineers to design a single PCB to process 40 TB/s of raw data from the detector. Pioneered the embedded processor firmware currently in use.

▼ labRemote— (pybind11) (python) (C++) (CI/CD) (wheels

Wrote the python-bindings for a C++ framework that slow-controls laboratory hardware, and enhanced the CI/CD to deploy pre-built, relocatable binaries to make it easier for technicians and users to install.

♥ Work History SCIPP, Santa Cruz, California

Hamiltonian August 2018 – present

Post-doctoral Researcher, ATLAS Experiment at CERN

- Led the effort within the 5000-person collaboration to adopt GitLab CI/CD for analysis development, paper publication, and documentation.
- Coordinated HPC resources for generating billions of Monte Carlo events for physics analyses
- Organized and instructed in software tutorials for hundreds of physicists.
- Built up the hardware, firmware, front-end, and back-end infrastructure for testing and qualifying CMOSbased electronic chips for the instrumentation upgrade of the ATLAS charged particle tracking detector for the next decade.
- Developed tooling and infrastructure to support the next-generation of data products published by physics collaborations, improving communication with theorists.

UChicago, Chicago, Illinois

August 2012 – July 2018

Graduate Research Scientist

- Migrated the 500k+ LOC C++ offline analysis project from SVN to Git and made it public.
- Collaborated with engineers on instrumentation design for the upgrade of the ATLAS detector real-time hardware-based decision-making system to process 40 TB of data every second.
- Developed and maintained a user-friendly C++ analysis framework for physics across multiple domains including Standard Model, searches for new physics, and calibrations.
- Came up with the innovative strategy to use OpenEmbedded firmware layer in hardware instrumentation which paved the way for embedded processor design in High Energy Physics

EDUCATION

(Ph.D.) University of Chicago, Chicago, Illinois

⊞ September 2012 − July 2018

% The search for supersymmetry in hadronic final states using boosted object reconstruction