

RYAN HANNIGAN

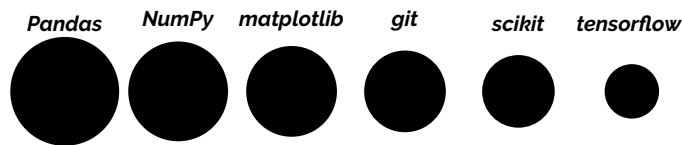
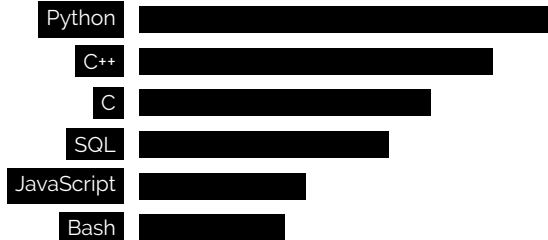
Data Scientist

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WHO AM I?

Particle physics PhD fellow at the University of Texas at Austin. Software engineer and data scientist for the ALICE experiment at CERN. Work involves a multitude of fields, from writing full-stack software for the LHC Run 3 hardware upgrade to investigating multi-dimensional strange hadron angular correlations in p-Pb collisions at ALICE. Expertise in software development and data analysis with Python and C++.



EXPERIENCE

- 2017 – present** **Data Scientist** **ALICE at CERN**
Analyzed proton-lead data from the Large Hadron Collider (LHC) to investigate multi-dimensional angular correlations with strange hadrons, which is pertinent to understanding Quantum Chromodynamics (QCD). Initial analysis performed using high throughput C++ software running on supercomputing cluster, with final analysis/systematic automation/data visualization done in Python.
Python / C++ / Jupyter / ROOT
- 2018 – 2022** **Software Engineer** **ALICE at CERN**
Developed an entire C++ software suite for testing and characterizing various hardware components for ALICE detector upgrade, which involved picosecond timing resolution and high throughput data transfers. Utilized OOP under the factory method design pattern with large focus on automation. Initial prototyping was done using Python under the unittest framework. Also incorporated hardware testing into gitlab pipeline to account for discrepancies in simulation.
C++ / Python / Git / QT / Flask
- 2019 – 2020** **Firmware Engineer** **ALICE at CERN**
Developed and implemented multiple FPGA modules for the primary readout board for the Inner Tracking System (ITS) of the ALICE detector upgrade. Modules were responsible for monitoring detector health as well as timing events at the picosecond level. Most modules written in VHDL, with USB interface written in verilog. Python was used to validate firmware modules in software.
VHDL / Verilog / Python / Git

EDUCATION

- 2017 - 2023** **Doctorate Degree (4.0 GPA)** **University of Texas at Austin**
Currently in final year of PhD program. Working towards a PhD in Particle Physics. Recipient of Graduate Provost's Excellence Fellowship, valued at over \$240,000. Completed courses include General Relativity, Quantum Field Theory, Geometric Foundations of Data Science and all core courses.
- 2012 – 2017** **Bachelor's Degree (3.9 GPA)** **University of Houston**
Received BS in both Physics and Mathematics at the University of Houston. Graduated Magna Cum Laude, and was #1 in the Physics Department. Advanced physics courses included Astrophysics, Quantum Field Theory, Devices and Sensors. Advanced math courses included Advanced Linear Algebra, Advanced Partial Differential Equations, Numerical Analysis.

LEADERSHIP

Shift Leader 2023, CERN
Teaching Assistant 2018-2019, UT
Physics Lecturer 2017, UH
Math Facilitator 2016-2017, UH
Physics Facilitator 2014-2017, UH

HOBBIES

I love playing video games (mainly CS:GO), working out, playing piano, coding, and I'm a huge fan of math puzzles or riddles. I also enjoy learning new things about Vim, the greatest text editor.

FUN FACTS

I currently play for the UT Varsity CS:GO team and am the only graduate physics student in the entire league. I also have synesthesia, meaning I hear colors.