Calvin Ainsworth

Address: 10963 Sheep Rd, Pittsburg, TX, 75686
Github: github.com/CalvinAinsworth

Email: jobbieainsworth@gmail.com
Mobile: (903) 371-9183

Education

- **Oklahoma State University** — Stillwater, Oklahoma
  Master of Science in Physics; GPA:3.5 — *August 2019-May 2023*
  Completed 30 hours of required coursework and 30 hours of research credits.
- **Kansas Wesleyan University** — Salina, Kansas
  Bachelor of Science in Physics; GPA:3.253 — *August 2015 - May 2019*

Skills Summary

- **Languages**: Moderate C++, Basic Python, ROOT
- **Frameworks**: Basic TensorFlow/Keras, Multivariate Analysis (MVA)
- **Tools**: Basic Docker, ALTIUM Design, Speedstack, Si9000, Microsoft Office, Asana
- **Platforms**: Linux
- **Soft Skills**: Leadership, Writing, Public Speaking, Time Management, Teamwork, Self-Motivating

Experience

- **ETX Earthworks** — Hybrid
  Estimator (Full-time) — *June 2023 - Present*
  - **Estimating**: Work alongside the General Manager to budget potential jobs and meet the bid deadlines by reading the plans, inputting them into Insight's take-off software, pricing materials through distributors, and completing the budget through quote templates that I created.
- **Graduate School** — Hybrid
  Graduate Student (Full-time) — *August 2019 - 2023*
  - **Physics Research**: Used data files to produce histograms, develop a neural network using TensorFlow, and develop an MVA to compare to the neural network. Boosted Decision Trees (BDT) was the selected MVA package which is an older machine learning method compared to the neural network that was being produced.
  - **Hardware Research**: Design PCBs using ALTIUM design, set up test stands and run simulations. Had received training in using an electron microscope, X-ray machine, and radiation safety.
  - **Teacher Assistanship**: Managed/taught labs and discussions. Made sure to create a safe and enjoyable learning environment for students.

Projects

- $t\bar{t}+c$ **cross section measurement analysis**: While working alongside the analysis team to measure the cross-section of the additional c-quark in the $t\bar{t}$ production. This measurement will help with reducing the background produced from the c-quark to better isolate the production of the Higgs. Studied the flavor schemes for sample production for the analysis. Used C++, ROOT, and Python to produce histograms from BDT studies and neural network studies. The neural network was made using TensorFlow/Keras.
- **Optoboard Testing Research**: Used Speedstack and Si9000 to simulate PCB designs to be designed and manufactured. These PCBs will be for the future Optoboards that are for the upgrade of the ATLAS Detector.
- **Production Database Quality Research**: Under my ATC Grant Award, I traveled to Argonne National Lab for 6 months and conducted research for improving the Production Database for ATLAS. This involved coordinating with the database team in organizing and finding ways to improve the database using packages created by senior physicists and engineers.
- **Time-domain Reflectometer adapter**: Used ALTIUM design to produce an adapter used for connecting to a TDR to test optobox connection. Optoboxes are within the ATLAS detector, and they hold optoboards which are used for DAQ and powering.

Honors and Awards

- ATC Grant Award - Spring, 2022
- Physics Student of the Year - Spring, 2019
- KCAC Football Championship - Fall, 2018
- Champions of Character for Kansas Weslyan Football Team - Fall, 2018
- Best Overall Poster Presentation for Oklahoma State Univeristy REU - August, 2018
- Second Place for best Educational Initiative for the Global Space Balloon Challenge - Spring, 2018

Conferences

- **American Physical Society's April Conference** — Minneapolis, Minnesota
  Presented Template Fit Studies from the tt+c Analysis at the conference. — *April 2023*
- **American Physical Society's April Conference** — New York City, New York
  Presented Flavor Scheme Studies from tt+c Analysis at the conference. — *April 2022*
- **Kansas Wesleyan's STEM Day** — Salina, Kansas
  Presented REU research to prospect students for KWU. — *Spring, 2019*
- **Regional American Physical Society at University of Houston** — Houston, Texas
  Presented REU research at the conference. — *Fall, 2018*