Abraham Teklu

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Summary

Particle Physics Ph.D. with experience in programming for data analysis. Used both Python and C++ for 9+ years for analysis on large data sets. Experience with presenting and communicating my ideas. As part of a team, created and executed relevant physics studies which led to new measurements of the neutron cross-section on scintillator.

Education

❍ **Stony Brook University** — Stony Brook, NY
- Doctor of Philosophy — Physics (2018 - Present)
- GPA: 3.67
- Awards: Turner Fellowship, Lourie Fellowship

❍ **Oregon State University** — Corvallis, OR
- Bachelor of Science — Physics (2014 - 2018)
- GPA: 3.80
- Awards: Academic Achievement Award, Nicodemus Scholar Award, Ken Krane Scholar Award

Skills

❍ **Technical Skills:** Python, C++, ROOT, Linux Bash, Docker, Singularity, Matlab, HTML
❍ **Quantitative Skills:** Linear Algebra, Differential Equations, Statistics, Calculus
❍ **Team Skills:** Presentation Experience, Communication in Large Collaborations, Problem-Solving
❍ **Research Skills:** Data Analysis, Data Parsing, Algorithmic Programming

Professional Experience

Stony Brook University
Graduate Research Assistant (August 2018 - Present)

- **Neutron Reconstruction for T2K [Super-FGD] (December 2021 - Present)** ROOT, C++, Python
  - ❍ T2K is a large collaboration of scientists, postdocs, and graduate students from around the world.
  - ❍ Working on a team to develop data analysis tools to select neutrons in neutrino events.
  - ❍ My current work improves neutrino energy calculations and the oscillation analysis fit, the main goal of T2K.
- **Construction of the Super-FGD for the T2K Near Detector Upgrade (October - December 2022)**
  - ❍ Worked with 20 people from across the world to assemble a detector made of 2 million scintillator cubes.
  - ❍ Assembly took place at JPARC, a high-intensity proton accelerator facility located in Tokai, Japan.
  - ❍ Completed the project and delivered the detector a month before the deadline.
- **T2K Oscillation Analysis in the MaCh3 Group (January - December 2021)** ROOT, C++, Docker, Singularity
  - ❍ Built a Docker container that enabled the first-ever joint collaboration oscillation analysis fit between T2K (with 500+ members in 12 countries) and NOvA (with 250+ members in 8 countries).
- **Novel 3D Scintillator Detector Prototypes (August 2019 - Present)** ROOT, C++, Python
  - ❍ Created and executed relevant physics studies that led to new measurements of the neutron cross-section and doubled the energy range of the existing neutron cross-section measurements on scintillator.
  - ❍ Worked with 61 researchers from 19 universities on the prototype construction at CERN (Geneva, Switzerland) and Stony Brook University (Stony Brook, NY). Led a data-taking team in Los Alamos National Lab (Los Alamos, NM) and was a major contributor to the analysis.
  - ❍ The work produced 3 co-authored publications and an APS April Meeting Talk.

Thoth - Programming Bootcamp (February 2023 - May 2023)

❍ Created a 6-week data science curriculum for a small group of disenfranchised minorities.
❍ Lectured and have 1-on-1 sessions to improve programming skill and help with assignments.

Visiting Research Assistant at CERN (June-August 2018) ROOT, C++, Python

❍ Helped assemble and test the Super-FGD Prototype, the world's first detector that can do event-by-event neutron kinematic reconstruction. Ran the first tests with a charged particle beam on a detector of this type.

SULI Internship at General Atomics DIII-D Tokamak Fusion Reactor (June-August 2017) C++, Python

❍ Worked with 3 staff scientists at DIII-D, to model plasma in the DIII-D Tokamak Fusion Reactor.
❍ Contributed to a co-authored publication, and presented a poster at the APS DPH Meeting. Also contributed to 4 other co-authored talks and posters.