

# Aditya Thapa

Python Developer | Machine Learning | Generative AI

San Francisco Bay Area

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## Professional Summary

Experienced Accelerator Systems Operator with a strong background in Python development, EPICS user interface development. Proven track record in developing and maintaining control system GUIs, troubleshooting complex accelerator systems, and collaborating with cross functional teams in high-stakes environments. Passionate about applying advanced technical skills to enhance operational efficiency and contribute to cutting-edge research.

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## Key Skills

- **Python for GUI Development**
  - **Data Visualization & Statistical Modeling**
  - **Machine Learning**
  - **Generative AI**
  - **Accelerator Safety & Operations**
  - **Accelerator Physics**
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## Professional Experience

**SLAC National Accelerator Laboratory, Menlo Park, CA**

**Accelerator Systems Operator**

*July 2022 – Present*

- **Developed Python-based GUIs** for accelerator control systems, significantly improving operational efficiency and user experience.
- **Operated and maintained complex accelerator systems**, ensuring optimal performance, safety, and adherence to operational protocols.
- **Wrote bench tests** for newly installed accelerator area (RSY) access control PLC, contributing to system reliability and safety.
- **Secured accelerator zones** by performing searches and assisting Safety Systems Engineering Department with routine PPS Certifications.

**University of Maryland Baltimore County, Baltimore County, MD**  
**Graduate Research Student**

*February 2021 - May 2022*

- Conducted high-energy astrophysics research focusing on active galactic nuclei (AGN), using **Python and HEASOFT** for data analysis.
- Discovered and documented unusual behavior in a changing-look AGN, contributing to a publication in [\*The Astrophysical Journal\*](#).
- Collaborated on projects involving statistical modeling and data analysis, utilizing Python libraries like **NumPy, Pandas, Matplotlib, and SciPy**.

**Graduate Teaching Assistant**

*February 2021 - May 2022*

- Facilitated undergraduate physics laboratories and recitals, providing guidance on problem-solving and experimental techniques.
- Awarded "Outstanding Graduate Teaching Assistant in Physics" for exemplary performance and dedication.

**Nepalese Center for Research in Physical Sciences, Kathmandu**  
**Intern**

*April 2017 - September 2018*

- Conducted atmospheric physics research using GPS-TEC and VLF data, employing **MATLAB, Python, and R** for data analysis.
- Designed and maintained the organization's official website, improving outreach and communication.
- Supervised high-school students on research projects, fostering a collaborative learning environment.

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**Education**

**University of Maryland Baltimore County**

Master of Science - MS in Physics

*2020 – 2022*

GPA: 3.4

**St. Xavier's College, Tribhuvan University, Nepal**

Bachelor of Science - B.Sc. in Physics

*2013 – 2017*

GPA: 3.7

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## Projects

### Software Development at SLAC (2022 – Present)

- [PhysicsAI tutor](#): Utilizing large language models to provide tutoring in introductory college physics.
- [Free Electron Laser tune-up with Bayesian Optimization](#): Made a BoTorch-based Python application for the accelerator control room that uses Bayesian Optimization with Gaussian Process Regression to improve the performance of the accelerator.
- [Badger \(Bayesian Optimization Tool for LCLS\) Visualizer](#): Developed a GUI to visualize optimization results, enhancing user interaction with the tool.
- **X-ray Beam Position Tracker GUI**: Designed and implemented a real-time tracking interface for beam position monitoring.
- **LCLS-II IOC Health Checker**: Created a diagnostic tool to monitor and report the health of IOCs in real-time.
- **PV Monitor CUD**: Created an application that aids in closely monitoring any EPICS PV.
- **Superconducting LINAC Feedback Display**: Developed a feedback display system for monitoring LINAC performance.
- **FACET-II Network Watcher Display**: Implemented a network monitoring interface to track system connectivity.
- **LAF Zone Search Validity Tracker GUI**: Designed a GUI to ensure the validity of zone searches within the accelerator facility.
- **EPICS interface update for LTU**: Redesigned BTH and EBD-FEE PPS diagnostics and access control panels (a total of 5 panels) and added new superconducting LINAC stopper system to the all the panels.
- **Worked on bench tests for RSY accelerator area access control PLC**: Wrote tests for multiple components of the RSY PPS system.

### X-ray and UV Analysis of a Changing Look Active Galactic Nucleus 1ES1927+654 (20212022)

- Performed a detailed analysis of 4 years of X-ray (SWIFT-XRT) and ultraviolet (SWIFTUVOT) spectral data of a changing-look active galaxy post-flaring event.
- Results published in [The Astrophysical Journal](#) and covered by [NASA Goddard](#).

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### Additional Courses/Certifications

- [Advanced Learning Algorithms](#) - DeepLearning.AI, May 2024 Skills: TensorFlow, XGBoost
- [Supervised Machine Learning: Regression and Classification](#) - DeepLearning.AI, May 2024

- [Unsupervised Learning, Recommenders, Reinforcement Learning](#) - DeepLearning.AI, May 2024
  - **Statistics for AI, Machine Learning, and Data Science** - Stanford Continuing Studies
  - **LLM for Business with Python (TECH 16)** – Stanford Continuing Studies
  - **Magnetic Systems for Accelerators, Detectors, and Insertion Devices** – USPAS 2024
  - **VUV and X-ray Free Electron Lasers** – USPAS 2024
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