

# Nischal Bhattarai

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## EDUCATION

**Bachelor of Science: The University of Alabama**, Tuscaloosa, Alabama December 2024  
Majors: Mathematics and Physics | Minor: Computer Science | Major GPA: 4.0/4.0

## RELEVANT EXPERIENCE

**High Performance Computing (HPC) Research Programmer** May 2022 - Present

*Office of Information Technology, University of Alabama, Tuscaloosa, AL*

- Managed deployment and maintenance of over 30+ MPI-supported scientific software, optimizing the software stack to achieve 15%+ performance and operational efficiency.
- Boosted HPC cluster efficiency with bash suits, 10+ tailored singularity containers, automating 20%+ of manual software maintenance workload.
- Configured Intel's and Nvidia's accelerated toolchain, libraries and containers for data science and AI, resulting in over 25% speed improvement in training and inference through distributed MultiGPU utilization and data parallelization techniques.
- Created UA's HPC website that houses information for over 100+ distinct scientific software applications, cluster computational metrics, and organized HPC training sessions, leading to 12% growth in user engagement.

**Research Assistant** December 2022 - Present

*Precision Timing, Navigation, and Frequency Lab, Tuscaloosa, AL*

- Led the development team for Navigator, a python library that enables real time geolocation services, GNSS data processing, and real-time data retrieval from NASA's CDDIS server.
- Designed 4+ optimal filtering algorithms for tracking and estimation using GPS/GNSS sensor data improving convergence and stability of predictions in a timeseries data over least squared estimators.
- Utilized recurrent neural networks to design data-driven approaches for enhanced state estimation and tracking, resulting in 10% increase in accuracy and 18% reduction in error variance.

## NOTABLE PROJECTS

**SlurmDocs: Automated Slurm Cluster Documentation** June 2023 - November 2023

- Engineered a python library and CLI tool for seamless documentation of Slurm clusters, catering to various cluster sizes from research clusters to large-scale HPC systems.
- Implemented modules for estimating cluster's computing power, remote cluster access, and visualizing metrics, all easily expandable through a user-friendly software design pattern.
- Developed a user-friendly Python API, simplifying cluster data collection, auto synchronization, and exporting data to multiple formats (HTML, PDF, CSV).

**Data Science & ML/DL Projects** March 2023 - June 2023

- Pioneered convenience torch toolkit to train AI models effectively, achieving precise dark matter classification via specialized 180-layered ResNet CNNs on gravitational lensing data.
- Utilized advanced ML models (K-Nearest Neighbors, SVM, Random Forest, Gradient Boosting) for tasks such as internet churn analysis, banknote authentication, and species classification.

## SKILLS

**Languages:** Python[advanced], C/C++, Java, HTML/CSS, Bash | **Tools:** Git/GitHub, Bash, Docker, VS Code, Linux  
**Libraries:** Pandas[advanced], PyTorch[advanced], SciPy | **Additional:** Project Design, Team Management

## ADDITIONAL CERTIFICATES

**Udemy Machine Learning and Data Science Masterclass** 2022  
Mastered core concepts of Data Science/ML and completed 40hrs of coursework for official course certification.

## LEADERSHIP AND ACTIVITIES

**Vice President | Alabama Table Tennis Association (ATTA)**, Tuscaloosa, AL May 2022 - March 2023

- Mentored new members through individual lessons and weekly practice sessions leading to improved tournament performance.
- Transformed club finances, increasing budgets, tracking expenses, and generating insightful reports for impactful decisions.