CLIVE **BINU**

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Education

08/2023 – Present | Astrophysics | PhD , Rochester Institute of Technology, Rochester, UNITED STATES OF AMERICA

06/2019 – 05/2023 | Astrophysics | Bachelor of Science , Texas Tech, LUBBOCK, UNITED STATES OF AMERICA
- Summa Cum Laude

Experience

08/2024 – Present | Student Teaching Assistant, RIT, ROCHESTER, NEW YORK, USA
- Helped the professors in classes (Modern Physics and University Physics 2) with grading, lab assistance and teaching

05/2023 – 08/2023 | Student Research Assistant, NRAO, CHARLOTTESVILLE, VIRGINIA, USA
- Created a GUI which is used to visualize RFI data from VLA.

06/2021 – 05/2023 | Student Research Assistant, APD LAB, LUBBOCK, TEXAS, USA
- Created a Machine learning model which classifies tomograms into in-focus and out-focus
- Created an object detection model coupled with k-means shape extraction.
- Created Super-resolution neural network which is for improving tomogram quality
- Created a simple hadronic interaction simulation with Geant4Python in python

05/2022 – 08/2022 | Student Research Assistant, NRAO, CHARLOTTESVILLE, VIRGINIA, USA
- Created python module for generating positions for star-link satellite.
- Created pipeline for analyzing data from start-link and VLA telescope

03/2020 – 05/2021 | Student Research Assistant, P3E Lab, LUBBOCK, TEXAS, USA
- Generated data models, performed data analysis and helped produce reports outlining results.
- Performed simulated experiments and research over to test for effects Transmission and reflection coefficient over various frequency selective surface model
- Performed simulated experiments and research over course of 5 Months to test for attenuation in high speed semiconductor switches and documented all findings.

Honors and Awards

2019 - 2022	Presidents Honor List : Awarded to students who earn a grade point average of 4.0 during a semester.
2023	Best Graduating Astrophysics Student
2022 - 2023	Gott Gold Tooth Scholarship
2022 - 2023	The J. W. Day Memorial Scholarship
2022 - 2023	The Kenneth Sterne Scholarship in Astronomy
2022 - 2023	Texas Tech University General Scholarship
Fall 2021	3rd place in Physics poster competition hosted by Sigma Pi Sigma and GRASP.
Spring 2021	Study Abroad Competitive Scholarship (SACS)
2021 - 2022	The C. C. and Alma K. Schmidt Award in Physics
2020 - 2021	The Kenneth Sterne Scholarship

Conferences

10/16/2021	**Presenter, Gulf Coast Undergraduate Research Symposium, Rice University ,Houston, USA** › Gave a Talk on Machine Learning in Muon Tomography
10/21/2021	**Presenter, APS TSAPS, Houston, USA** › Gave a Talk on Machine Learning in Muon Tomography
01/8/2023	**Presenter, AAS 241, Seattle, USA** › I-poster on VLA RFI GUI
01/8/2024	**Presenter, AAS 243, Louisiana, USA** › I-poster on VLA RFI GUI
2021, 2022, 2023	**Presenter, Undergrad Research Conference (URC), Lubbock, USA** › Gave a Talk on Machine Learning in Muon Tomography

Skills

Computer skills

Python	●●●●●
LaTEX	●●●●○
C++	●●●●○
CASA	●●●●○
Fusion 360	●●●●○
CST Studio	●●●●○
Comsol	●●●○○

Other Skills

- Experience in Machine learning and Deep learning. Also familiar different OS like Windows, Linux and Mac
- Experience in Computational coding using python

Projects

Continuous Wave Software Injection 01/2024 – Present

Developing and fixing the pipeline of continuous gravitational wave detection algorithm in the upcoming O4 data

Galaxy CNN 08/2023 – 11/2023

Developed Deep Learning model which is used to classify galaxies based on their morphology. This model was bult using transfer learning and the parent model that is used to built is VGG16 and the dataset was obtained from galaxy zoo

VLA RFI GUI 05/2023 – 08/2023

Developed a graphical user interface (GUI) which can be used to look at radio freqeuncy interfernce (RFI) from Very Large Array Telescope (VLA) RFI scans and can be used to further analysis of these data

Machine Learning in Muon Tomography 06/2021 – 05/2023

Implementation of machine learning concepts in muon tomography like object detection, image classification and image resolution enhancing that helps in the 3D reconstruction of the scanned object using muons.

Impact of Star-Link on the VLA

05/2022 – 08/2022

This project is focused on studying the impact of RFI on data collection at the Jansky Very Large Array (VLA). This study was carried out mainly by conducting a series of measurements in collaboration with SpaceX, and through analyzing and comparing the data from the VLA with telemetry provided by SpaceX.

High Speed semiconductor switch

08/2020 – 05/2021

Semiconductor switches are devices that produce short RF pulses in the microwave to the infrared frequency. A septum model consisting of silicon is created and is illuminated with a laser. The attenuation vs power graph is then plotted .

Aws Deep-racer

12/2020 – 03/2021

AWS DeepRacer is an autonomous 1/18th scale race car designed to test RL models by racing on a physical track. The AWS Deepracer is trained in a Ubuntu system which has to be configured to use Nvidia GPU. After training and evaluation, the model is then transferred to AWS Deepracer for racing on a physical track.

N-Body Simulation

11/2020 – 12/2020

N-Body Simulation uses python to solve for equations of motion for N-particles interacting gravitationally using the Runga Kutta method to solve for the equations of motion. The result is visualized using 3D animation using matplotlib.

Frequency Selective Surface [FSS]

03/2020 – 08/2020

A frequency-selective surface is any thin, repetitive surface designed to reflect, transmit, or absorb electromagnetic fields based on the frequency of the field. A tripole based model with FR-4 has a substrate in CST. The model is then simulated in CST and the performance of the model is analyzed.