

# ANANYA BHATNAGAR

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## Relevant Experience

### The University of Manchester

September 2022 – Current

Postgraduate Research Student

Manchester, Greater Manchester

- Achieved excellent results as a postgraduate Master's student at the University of Manchester, pioneering the development of advanced deep learning models for fitting simulations from the Line Analysis Software (XCLASS) in the field of massive star formation.
- Enhanced the identification and characterization of the methanol ( $CH_3OH$ ) molecule in spectra through thorough research and precise fine-tuning of deep learning models.
- Significantly enhanced the accuracy of XCLASS parameters through custom performance evaluation metrics of deep learning models, leading to highly improved fitting simulations.

## Other Experience

### The University of Manchester

September 2022 – June 2023

Graduate Teaching Assistant

Manchester, Greater Manchester

- Achieved significant improvement in second-year physics undergraduate students' data analysis, Python coding, and understanding of moderate-risk setups and procedures through effective guidance in astronomical computing and non-experimental research labs.
- Streamlined assessment and evaluation post experiments by conducting in-depth interviews and designing targeted questions, resulting in comprehensive insights into participants' abilities.
- Developed and implemented innovative feedback strategies, fostering a positive learning environment that facilitated students' improvement in report writing, experimental procedures, and result analysis leading to 80%+ grades across 90% of the batch.

### RoboSlog, Ltd

July 2021 – September 2021

IoT Robotics Engineer Intern

New Delhi, Delhi

- Played a key role in the successful development and deployment of commercially viable IoT projects utilizing diverse micro-controller technologies.
- Demonstrated strong teamwork and coordination skills while collaborating with a 4-member team, effectively utilizing version control systems like Git to streamline modifications and task assignments.
- Effectively integrated new environments by utilizing communication protocols like UART, enabling seamless functionality and improved performance in the developed systems.

## Education

### University of Manchester

Sep. 2022 – August 2023

Master's by Research in Astrophysics and Astronomy  
Results expected

Manchester, Greater Manchester

### Guru Gobind Singh Indraprastha University

Aug. 2018 – May 2023

Bachelor of Technology in Electronics and Communications Engineering  
GPA: 8.6/10

New Delhi, Delhi

## Projects

### Anomaly Detection on real-world data | Data processing, DL models, MLOps

October 2023

- Collected real-world data from session hosting servers via web scraping and a public API and transformed, structured, and preprocessed the data using domain knowledge to create a custom dataset.
- Employed industry-standard techniques and libraries to streamline data preprocessing and transformation.
- Leveraged performance optimization methods, such as GPU utilization and parallel processing to train anomaly detection models, including DeepSVDD, Deep Isolation Forest, PReNet, and DeepSAD. DeepSAD notably outperformed all others.

- Developed a Flask-based web application for RESTful requests, and management and handling of user and demo data and Integrated sqlite3 databases to securely store user login credentials and essential metadata related to uploaded data.

#### **Fine Tune BERT for text Classification with TensorFlow | *TF-Hub, TensorFlow, BERT***

**July 2023**

- Acquired skills in building TensorFlow input pipelines for text data with the tf.data API, including tokenization and preprocessing of text for BERT.
- Successfully integrated a classification head to the BERT hub.KerasLayer and fine-tuned BERT for text classification, followed by evaluating the performance of the model.

#### **Semantic Segmentation using SageMaker | *AWS, Deep Learning, SageMaker***

**July 2022**

- Utilized a high level Amazon SageMaker interface estimator.Estimator() to implement a semantic segmentation algorithm on a preprocessed dataset.
- Deployed and evaluated model performance to achieve improved results.

#### **Technical Skills**

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**Languages:** Python, C++, SQL (Postgres, NoSQL, sqlite3)

**Developer Tools/Frameworks:** Google Cloud, Amazon Web Services, Git, Docker, Tensorflow Extended, PyTorch