

ANANYA BHATNAGAR

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Experience

Postgraduate Research Student

September 2022 – August 2023

The University of Manchester, Manchester, United Kingdom

- Developed novel deep learning techniques for spectral simulations in the field of massive star formation.
- Enhanced identification of the methanol (CH_3OH) molecule (compared to existing methods) in spectra through utilization and fine-tuning of deep learning model architectures like DCNN, DTNN, INN and transformers.
- Presented seminars within Jodrell Bank Centre for Astrophysics (department of astrophysics) and the JBCA ML Club.

Education

Guru Gobind Singh Indraprastha University

Aug. 2018 – May 2022

Bachelor of Technology in Electronics and Communications Engineering

New Delhi, Delhi

GPA: 8.6/10

Projects

MassiveStarSuite | *Astrophysics, Research, Computer Vision, APIs (Website)* (GitHub)

June 2024

- Trained a classifier from extremely low resolution spectral data to identify massive stars.
- Designed an extremely lightweight model that was used to detect massive stars from over 1 million objects.
- Experimented with network architectures, training methodologies and data representation that to create a model beats all traditional SOTA models and achieves an accuracy of 97%.

BitGPT | *Language Models, NLP* (GitHub)

March 2024

- Implemented a 1-bit, decoder large language model which showed a $\sim 25\%$ decrease in size compared to its equivalent vanilla GPT model.
- Introduced deep learning SOTA practices to the existing GPT architecture improving accuracy, and provided flexibility to train models from 50k to over 1B parameters.

Gemini-Apps | *Generative AI, NLP* (GitHub)

February 2024

- Utilized Google's Gemini Pro API to create a collection of apps automating natural language tasks.
- Implemented an 'ATS scanner' app increasing chances of receiving a reply from an application to upwards of 80% and created a RAG-based application.

Anomaly Detection on time-series data | *Data processing, DL models, MLOps* (GitHub)

October 2023

- Engineered a custom dataset, automated scraping and processing tasks and optimized data loading with parallelization.
- Leveraged SOTA models, including a Deep SVDD, Deep IF and Deep SAD. Tabular models surprisingly outperformed time-series models, resulting in an accuracy of detection of anomalies of over 73%.
- Developed a Flask-based web app for handling API requests and dockerized the app for deployment.

Technical Skills

Languages: Python, C/C++, SQL (Postgres, sqlite3)

Developer Tools/Frameworks: Google Cloud, Amazon Web Services, Git, Docker, Tensorflow, PyTorch, Unix bash scripting