Abhimanyu Borthakur

Education

- **BTech in Electronics and Communication** with a minor specialization in Data Science
  - *CGPA:* 9.24/10
  - *CGPA (minor):* 10/10
  - Ranked 1st in the 7th semester out of 227 students with a GPA of 9.8/10

Research Collaborations

- **IIT Bombay (Presently)**
  - Designed a custom algorithm for semantic segmentation of solar plages and area calculation
  - Achieved a positive correlation of up to 96% between calculated and ground truth areas
  - Integrated the algorithm with a Python webapp deployed on GCP with BigQuery as a storage backend
  - Worked on a project to design and train a novel Bayesian Neural Network to classify and quantify uncertainty in SDSS Galaxy data.
  - Co-authored papers for both projects, with abstracts selected at the Astronomical Society of India and the paper for plage segmentation under review at the Royal Astronomical Society Techniques and Instruments journal
  - Code
- **IIT Goa (Summer '21)**
  - Implemented this paper in TensorFlow 2.x
  - Achieved impressive results (0.06 MAE) on adapting the network for image reconstruction
  - Code

Work Experience

- **Machine Learning Engineer, Searce Inc (Jan 2022 - Sep 2022)**
  - Prepared for and achieved the Google Cloud Professional Machine Learning Engineer Certificate
  - Developed a .json file parsing algorithm for US-based automation client
  - Built a custom OCR project for extracting fields from Income Tax Return Acknowledgement forms using YOLO architecture, achieving an average extraction time of 3.43 s and mean average precision of 96.9% on the validation set and 92.1% on the test set
  - Performed literature review of various techniques for legal document summarization and developed Jupyter notebooks for the same
  - Developed an object detection model for document localization on wooden surfaces obtaining a mean average precision of 97.1% and used Google Cloud Vision API to extract barcodes from said documents

Projects

1. Income Tax Return OCR using YOLO and Tesseract OCR Engine

- Automating and deploying field extraction in ITRA forms as a Streamlit webapp
- GitHub repository

2. 4x4 MIMO in a non-uniform Nakagami-m fading channel

- Associated with the Communication Networks Lab
- Final Grade: A+
- GitHub repository

3. NYC OpenData Dashboard

- A single-page Streamlit dashboard providing insights into motor vehicle crashes in NYC, deployed on Amazon Web Services EC2
- GitHub repository

Skills

- **Languages:** C, C++, Python, MATLAB, LabVIEW, R, RStudio, SQL
- **Frameworks:** OpenCV, TensorFlow, Scikit-Learn, PyTorch
- **Cloud:** GCP, AWS
- **Experiment tracking:** Weights and Biases
- **Version Control:** Git

Certifications

- Click Here

Publications

- *An Image Processing approach to identify solar plages observed at 393.37 nm by Kodaikanal Solar Observatory*
- Submitted to Royal Astronomical Society Techniques and Instruments
- Link