ARNAV RAI

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EDUCATION

Course	Institute	Year of Passing	Result
B.Tech - CE (Major); CS (Minor)	IIT Jammu	Expected 2024	7.73 CGPA
12th Standard	K.C. Public School	2020	94.6%
10th Standard	K.C. Public School	2018	91.2%

WORK EXPERIENCE

Indian Institute Of Technology Roorkee (IITR)

Deep Learning & Computer Vision Intern, Roorkee, Uttarakhand (May 2023 - Sept 2023)

- Developed computer vision and deep learning models to accurately count passengers using surveillance cameras
- Utilised state-of-the-art techniques and algorithms to analyze real-time video footage and detect human presence
- Developed Spatiotemporal Air Pollution Prediction models to accurately forecast PM2.5 levels.
- Researched and kept up-to-date with the latest advancements in computer vision and deep learning techniques
- Assisted in developing a research paper on using deep learning and computer vision for accurate passenger counting

National Highway Authority of India (NHAI)

Summer Intern, Udhampur, J&K (Jun 2022 - Aug 2022)

- Acquired proficiency in project management, construction supervision, and quality assurance
- Collected and analyzed vehicular loading data for this segment of the highway
- Gained experience observing the industry-grade equipment used for laying flexible pavement in this section

PROJECTS

Passenger Counting System using Surveillance Cameras

Deep Learning & Computer Vision, IITR (May 2023 - Sept 2023)

- Developed a deep learning-based model for accurate door state estimation, passenger counting and tracking
- Implemented Canny edge detection & Hough transformation, resulting in a 99.61% correct rate for bus door state estimation
- Conducted rigorous model training, fine-tuning, and hyperparameter optimization, resulting in high accuracy
- YOLOv8 for precise head detection, deepSORT enhanced tracking, achieving an F1 score of 0.9333 in passenger counting

Predictive Modeling of Spatiotemporal Air Pollution

Data Science, IITR (May 2023 - Sept 2023)

- Developed a Spatiotemporal Air Pollution Prediction Model for Delhi, considering location and time variations.
- Conducted comprehensive data preprocessing, feature engineering, EDA, and spatial analysis using QGIS.
- Employed Time Series Models (ARIMA, VAR, VARMAX) for temporal analysis and achieved RMSE of 29.033 with VARMAX.
- Engineered STGNN and STGCNN Graph Deep Learning models for precise next-hour PM2.5 prediction.
- Attained exceptional model performance with an average MSE of 19.0432 for STGNN and 12.3012 for STGCNN.

Machine Learning-Based COVID Risk Assessment Web Tool

Machine Learning & Web Development, IIT Jammu (Jan 2023 - Mar 2023)

- Conducted a comparative analysis of various algorithms, including K-nearest neighbours, Random Forest, and Naive Bayes
- Performed data preprocessing and feature engineering to enhance the predictive accuracy
- Achieved over 96% accuracy in COVID-19 risk prediction
- Developed a user-friendly tool for individuals to assess their COVID risk
- Deployed the machine learning model for COVID risk assessment onto the website utilising django

Smart India Hackathon 2022 - Software Edition (Grand Finalist) (Top 5)

Computer Vision, IIT Jammu, National Institute for Empowerment of Persons with Multiple Disabilities (Jan 2022 - Aug 2022)

- Utilised YOLOv3 to track the in/out movement of students from campus premises using face recognition
- Implemented a technique to track the attendance of students using face recognition
- Collaborated with a cross-functional team to ensure seamless deployment of the integrated system
- Integrated WhatsApp API to send students and parents the weekly or on-demand in/out and attendance records
- Conducted thorough testing and optimization, enhancing accuracy and reliability

SKILLS

Programming Languages	C/C++, Python, JavaScript
Softwares	Git, AUTOCAD, MATLAB
Web Development	React.js, Django
Frameworks	TensorFlow, Keras, PyTorch
Data Analytics	MySQL, MS Excel, Power BI
Computer Vision	OpenCV, Object Recognition, Object Tracking
Machine Learning	LSTMs, GANs, LLMs, CNNs
Soft Skills	Presentation, Public Interaction, Public Speaking

ADDITIONAL DETAILS

Achievements

- Selected for IIT Roorkee's SPARK Internship '23 from 32,000 applicants, achieving one of 124 spots
- Grand Finalist, Smart India Hackathon (Software Edition) '22
- National Runner-Up, INTER IIT Civil Conclave '22 & '21

Publication

- Rawat, Nishtha, Arnav Rai and Amit Agarwal (2024). "Deep Learning-based Passenger Counting System using Surveillance Cameras". Accepted in 9th workshop on Intelligent Transportation Systems with 16th International Conference on COMmunication Systems & NETworkS (COMSNETS)

Certifications

- Machine Learning Specialization
- Deep Learning Specialization
- Foundations of User Experience (UX) Design

Position of Responsibility

- Team Leader, Smart India Hackathon (Software Edition) '23
- Contingent leader, Inter IIT Aquatics Meet '22 & '23
- Contingent leader, Inter IIT Civil Conclave '22
- Head Of Public Relations, Annual Cultural Fest, RENAO'23
- Head of Media Coverage, Annual Cultural Fest, RENAO'22
- Head of Media Coverage, Media Cell, IIT Jammu '22