PRAHLAD ANAND

Ph: +91 7349470717, Email: prahladanand2002@gmail.com, LinkedIn: www.linkedin.com/in/prahlad-anand/

EDUCATION

Vellore Institute of Technology, Vellore, India 2020 – 2024 (expected)
Bachelor of Technology, Computer Science and Engineering **GPA: 8.86/10.0**

National Public School Koramangala, Bangalore, India 2005 – 2020
Class Rank 1 in Mathematics, English and French **Class XII: 96.4%, Class X: 96.6%**

Admissions Test Scores **GRE: 335/340, TOEFL: 114/120, IELTS: 8.5/9.0**

EXPERIENCE

AI and Robotics Lab, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, India

Research Intern Jan 2024 – Present
- Introduced a Semi-supervised RGB-to-IR Image-to-Image Translation Generative Adversarial Network to generate IR images from RGB images. Both supervised and unsupervised branches use contrastive learning-based losses.
- Models trained on images generated by the network consistently outperform those trained using other image-to-image translation (I2I) networks in downstream tasks such as segmentation and detection by 3.5-8.3%.
- Introduced supervised image translation for infrared image augmentation, improving accuracy by up to 5.2%.

Research Intern May 2023 – July 2023
- Boosted the accuracy of common object detection frameworks (Yolo, Faster/Mask RCNN, SSD) by up to 7% on EO-IR datasets through image fusion approaches and data augmentation using generative models.
- Trained and evaluated multiple state-of-the-art image translation models, generative adversarial networks (GANs) and diffusion models on the task of converting RGB images to infrared images to improve object detection accuracy.
- Introduced super-resolution into the image augmentation pipeline to further improve accuracy by 5%.

Research Intern May 2022 – July 2022
- Improved the accuracy of multiple convolutional neural network (CNN) models (variants of VGGNet, ResNet) on multi-modal aerial image classification by 7.5% using data augmentation, weighted random sampling and modified loss functions (LDAM, focal, cross-entropy).
- Confirmed through experimentation that a model with complex-valued weights and gradient cannot be replicated by stacking two real-valued gradients.

PUBLICATIONS

Sikdar, A., Saadiyean, Q., ***Anand, P.,*** *Sundaram, S. (2024).* ***SSL-RGB2IR: Semi-supervised RGB-to-IR Image-to-Image Translation for Enhancing Vision Task Training in Semantic Segmentation and Object Detection.*** *IROS.*

PROJECTS

Product Recommendation System
- Implemented a system to create a dataset on the fly using web scraping and recommend products based on images, titles, and brand information according to user choice.
- Used a deep CNN as a feature extractor to compute image similarity, and used NLP techniques including stopword removal for pre-processing and cosine similarity together with a count vectorizer to compute brand/title similarity.

Intrusion Detection using Multi-Model Decision Trees
- Implemented a Mixture-of-Experts model composed of multiple decision trees for the benchmark NSL-KDD dataset, using recursive feature elimination (RFE).
- Manually fine-tuned decision tree parameters including depth using confusion matrices to improve model efficiency and attained a detection accuracy of 99.738%.

Email Phishing Detection using Machine Learning Models

- Implemented a multi-model email classifier, using Term Frequency - Inverse Document Frequency (TF-IDF) and stopword removal to perform data preprocessing. Used ROC-AUC curves and cross-validation to learn optimal hyperparameters.
- Compared Decision Tree models augmented with pruning and boosting (Adaboost), k-Nearest Neighbors (kNN) and Support Vector Machines (SVM) and achieved a peak accuracy of 99.79% with a polynomial kernel SVM.

Electroencephalogram (EEG) Data Classification
- Performed classification on an EEG dataset with the aid of CNNs using dropout, Recurrent Neural Network (RNN) units and 1D and 2D convolutional layers. Also experimented on EEG data directly using RNNs.
- Software Development: Python, Java, C++, JavaScript, PHP, MySQL
- ML Frameworks: PyTorch, TensorFlow, Jupyter Notebooks

RELEVANT COURSEWORK
- Applied Linear Algebra, Predictive Analytics, Natural Language Processing, AI, Machine Learning
- Design and Analysis of Algorithms, Java Programming, Theory of Computation, Internet and Web Programming

HONORS AND ACCOMPLISHMENTS
- Trainee in Particle Physics at CERN, Geneva (2019)
- Winner, International Science and Creativity Olympiad, IIT Delhi (2018)
- Ranked in top 1% of students of IIT Kanpur's Wildlife Ecology course (2023)
- Ranked in top 1% of students of IIT Roorkee's Public Speaking course (2022)
- Winner/Finalist at 20+ Inter School and Intra school Quiz competitions (2012-2020)
- Ranked 24th in India in Alliance Francaise B1 Level Examination (2017)
- Ranked 172 in Karnataka State in the National Science Talent Search Examination (2017)
- Level 1 Award in Grade 3, Plectrum Guitar, Trinity College, London (2017)

VOLUNTEERING
- Reviewer, IROS 2024.
- Raised funds for the education of the underprivileged and orphans and provision of vocational training for youths affected by the Covid-19 pandemic at Muskurahat Foundation. (2022)
- Developed educational material for Children's Movement for Civic Awareness, an NGO dedicated to furthering and bettering the education of underprivileged children. (2022)
- Campaigned to raise awareness and funds to save the environment through afforestation and the cleaning of lakes at Save Green Organization. (2021)

LANGUAGES
English (Expert), French (Intermediate), German (Basic), Hindi (Intermediate), Tamil (Basic)