Raman Kumar Jha

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Education

New York University **New York, USA**
Master of Engineering in Computer Engineering

Savitribai Phule Pune University **Pune, India**
Bachelor of Engineering in Computer Engineering, GPA: 8.8/10.0 July 2019 - June 2023

Relevant Coursework: Principles of Programming Languages, Data Structure, and Algorithms, Discrete Mathematics Artificial Intelligence, Data Science and Big Data Analytics, Machine Learning, Deep Learning, Image Processing

MOOCs & Online Courses

Prediction and Control with Function Approximation - University of Alberta(Coursera)
Sample-based Learning Methods -University of Alberta(Coursera)
Fundamentals of Reinforcement Learning - University of Alberta(Coursera)
First Principles of Computer Vision - Columbia University
Deep Learning Specialization - DeepLearning.AI(Coursera)
Machine Learning - Stanford University(Coursera)

Technical Skills

Programming Languages: Python, C/C++, Matlab, Octave, HTML, CSS, LaTeX
Libraries: Pytorch, Tensorflow, OpenCV, Scipy, Scikit-Learn, Keras, MatplotLib, Numpy, Pandas
Environment/Tools: ROS, Linux, Git/GitHub, AWS/GCP, Jupyter, Docker, Anaconda

Publications

[1] **ThermalCrossNet: Cross Attention Network using RGB and Thermal Images for Low-Light Image Enhancement**
Raman Jha, Adithya Lenka, Mani Ramanagopal, Aswin C. Sankaranarayanan, Kaushik Mitra
British Machine Vision Conference (BMVC) 2024 **Under Review**

[2] **A Contrastive Meta-Learning Approach with Isotropic Sparse Decomposition for Scalable Audio-Visual Learning**
Dhruv Dixit, Paritosh Pandey, , **Raman Jha**, Pranshul Bhatnagar, and Shashank Mouli Satapathy
International Conference on Computing, Communication and Learning (CoCoLe), 2024 **Accepted**

[3] **Detection of Vehicle Lights and Classification of Its State**
Raman Kumar Jha, Rohit Saluja, Ravi Kiran Sarvadevabhatla, and C. V. Jawahar
International Conference on Advanced Computing Technologies and Applications (ICACTA), 2023 Paper

[4] **Age and Gender Recognition Using Convolutional Neural Network**
Raman Kumar Jha, Deepak Kumar, Shubham Kumar, Arsad Ali, Priyadarshini Patil
International Journal of Advanced Research in Science, Communication (IJARSC), 2023 Paper

[5] **Prediction of Bankruptcy of a company using machine learning techniques**
V. Kothuru, **Raman Kumar Jha**, S. Ranjit, B. V. Kumar Reddy, S. Roy and S. Sudheer
International Conference on Electronics and Sustainable Communication Systems (ICESC), 2022 Paper

Experience

Computational Imaging Lab, IIT Madras **Chennai, India**
Research Assosciate *Aug 2023 - June 2024*
Mentored by **Prof. Kaushik Mitra** and **Prof. Aswin C. Sankaranarayanan**
Developed a Cross-attention network for low-light image enhancement and restoration for Autonomous systems.
Used Thermal images as a guide for RGB images to improve the performance of the enhancement algorithm.
Presented our own collected real-world V-TIEE dataset consisting of 40 RGB and thermal image pairs from CMU.
Significant improvements over the previous networks using only RGB images were observed.

SeiSei.ai **Jaipur, India**
Founding Machine Learning Intern *April 2023 - July 2023*
Worked on the transformation of videos with the help of Generative AI technologies.
Developed a system to detect and extract the landmarks from the face of a particular individual in a video.
GAN-based FreeVC model was used for the conversion and enhancement of voice in audios.
Incorporated DINet model in the system for performing visual face dubbing on the high-resolution videos.
The performance of the final model was improved by 17% than the earlier one and it was later deployed on the system.

Dalhousie University **Halifax, Canada**
Mitacs Globalink Research Intern ***Research Report*** *July 2022 - Oct 2022*
Mentored by **Prof. Andrew Rutenberg**
Worked on classifying which health variables are of low dimensions and which are of high dimensions.
Variational Autoencoder and Recurrent neural network was used for the development of the model.
The model were trained and tested on English Longitudinal Study of Ageing (ELSA) dataset.
Latent space model for each health variable performed really well and improved the model performance by 14%.
Developed a modified and separate filter for the latent space model to calculate the loss function of each health variable.

Centre of Visual Information Technology Lab (CVIT), IIIT Hyderabad **Hyderabad, India**
Applied Research Fellow *Jan 2022 - June 2022*
Mentored by **Prof. Ravi Kiran Sarvadevabhatla** and **Prof. C V Jawahar**
Worked on detecting vehicle lights and classifying the state of the light.
Trained various object detection models including YOLO V7, YOLO V5, YOLO V4, Faster RCNN, and MobileNet.
All the models were trained and tested on the Indian Driving Dataset(IDD).
YOLO V7 performed best among all object detectors for detecting vehicle lights and achieved an mAP of 88.4%.
Fine-tuned and modified the YOLO V7 model for receiving better detection accuracy of small size vehicle lights.
Used color thresholding principle for the recognition of red and white colors in vehicle lights.

Centre for Artificial Intelligence and Robotics (CAIR), DRDO **Bengaluru, India**
Research Intern *July 2021 - Dec 2021*
Mentored by Dr. Vinayak Nageli
Worked on the detection of pedestrians and then the prediction of their trajectory.
Pedestron model was used for the detection of pedestrians for both first-person view (FPV) and birds-eye view (BEV).
Conditional Variational Autoencoder (CVAE) with Recurrent Neural Networks (RNNs) was used to encode observed trajectories of the pedestrian and decode future trajectories.
The model used Joint Attention in Autonomous Driving (JAAD) Datasetand Pedestrian Intention Estimation (PIE) Dataset.
The detection and prediction results were promising and it was later deployed on an autonomous robot.

Teaching

Teaching Assistant **Spring 2024**
Modern Computer Vision **IIT Madras**
Conducted tutorial classes on the basics of programming and Deep Learning.
Evaluated assignments and projects for modern computer vision on Moodle.
Discussed and Mentored students for their course projects, competitions, and hackathons.

Projects

Snake and Apple game Github **Jan 2024 - Mar 2024**
A Snake and Apple game using reinforcement learning to maximize apple eating, and minimize hitting the wall.
Q learning method was used to learn agent from experience and improve simultaneously.
Bellman equation is used to update the value function of the system in the game.

American Sign Language Recognizer Github **June 2022 - July 2022**
An American Sign Language Recognizer that can detect the sign language using the hand gestures.
It detects the hand gestures and then recognizes various signs like Hello, I Love You, Yes, No, and Thank You
YoloV5 is used for the recognition of Sign Language and used real-time images captured by the camera.
It achieved an recognition accuracy of 97.4% for American Sign Language Recognition.

Driver Drowsiness Detector Github **May 2021 - June 2021**
A Driver Drowsiness Detector which can detect the drowsiness of a driver using the eye condition.
It detects the eye condition of the driver and then detects the drowsiness and classifies it as awake or drowsy.
It uses the CNN-based model for the drowsiness detection of the driver and used real-time images captured by the camera.
It achieved an detection accuracy of 85.2% for the driver drowsiness detection.

Academic Service

Reviewer: BMVC (2024), ICLR Tiny Papers(2024), ICVGIP(2023)

Achievements and Extracurriculars

[1] Mitacs Globalink Research Fellowship 2022

[2] **Finalist**, Smart India Hackathon 2022

[3] **Winner** Codeheat contest, FOSSASIA 2021

[4] **Script Fellowship**, Script organization. 2021

Community Services

[1] Worked as a **Mitacs Globalink Ambassador** of the Mitacs Globalink Research Internship program to assist and guide upcoming interns for their research internship from March 2023 to June 2023.

[2] Served as a Machine Learning Lead of the Google Developer Student Club of my college from August, 2021 to