

Mridul Gupta

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OBJECTIVE

Ph.D. student in Electrical and Computer Engineering looking for a summer internship in the field of Computer Vision, Deep Learning and Image Processing.

EDUCATION

Purdue University

- Ph.D. in Electrical and Computer Engineering Aug 2018 – present
- GPA- 4 on a scale of 4.
- M.S. in Electrical and Computer Engineering Aug 2018 – Jul 2021
- GPA- 3.80 on a scale of 4.

Indian Institute of Technology Roorkee, India

- Bachelor of Technology, GPA-8.21 on a scale of 10. Jul 2013 – Jun 2017

INTERESTS

- Deep Learning, Computer Vision, Machine Learning

SKILLS

- Languages - Python, C++
- Libraries - OpenCV, TensorFlow, Keras, PyTorch

EXPERIENCE

Research Assistant, VIPER Lab, Purdue University, Advisor: Prof. Edward J. Delp

Mar 2019- Present

- Working on a **GAN** based algorithm to generate **synthetic food** images for a large number of classes
- Investigating methods for sub-pixel localization of targets using information from multiple bands
- Working on a method to detect low SNR small targets in dual band infrared images using **Image Processing** and **Machine Learning** to leverage information from their spatial, spectral and temporal domain
- Developed a **CNN** based algorithm that classified buildings on coastal areas as residential or commercial from their google street view images with an accuracy of **94%**

Teaching Assistant, EPICS, Purdue University

Aug 2019- Dec 2019

- Mentored 4 teams of undergraduate students working on 6 multi-disciplinary projects covering various domains including Image Processing and Machine Learning
- Held two python skill sessions for the students who wanted to learn the language for their projects

Quantitative Analyst, HSBC, India

Jun 2017 – Jun 2018

- Maintained the Fixed Income Product's pricing library and worked on adding new features and developing methods for faster and accurate pricing

Research Internship, IPSA Lab, Indian Institute of Technology Ropar, India

May 2016 – Jul 2016

- Improved the accuracy of forgery detection in single-sensor images using **expectation/maximization** algorithm in **MATLAB**
- Extended the use of algorithm to single-sensor multi-spectral images
- The accuracy varies with size of forged region and is **93.75 %** for **8%** forgery

Research Internship, ITS Lab, Indian Institute of Technology Madras, India

May 2015 – Jul 2015

- Developed a vehicle recognition software in **Python(Keras)** using **CNN** and **LSTM** which was used to calculate road parameters
- The software can categorize and track the vehicles with an accuracy of **95%**

PROJECTS

Video Frame Interpolation

Spring 2021

- Implemented a separable convolution based algorithm for interpolation of video frames to increase temporal resolution
- Modified the method to interpolate frames weighted by occlusion masks which decreased the convergence time of the algorithm to **30%**

Feature Projection Network

Spring 2021

- Implemented the feature projection network which projects the features from a dataset in a direction orthogonal to the common features thus increasing their discriminative quality
- Encoder for the network was implemented using 3 blocks of a single head transformer whose classification accuracy increased by **2%** by using feature projection

PUBLICATIONS	<ul style="list-style-type: none"> ▪ Building height estimation via satellite metadata and shadow instance detection, H.Hao, S. Baireddy, E. Bartusiak, M. Gupta, Kevin LaTourette, Latisha Konz, M. Chan, M. L. Comer, E. J. Delp, Automatic Target Recognition XXXI, SPIE 11729, 2021. ▪ Small Target Detection Using Optical Flow, M. Gupta, S. Baireddy, J. Chan, M. Krouss, P. Martens, M. Chan, M. L. Comer, E. J. Delp, IEEE Aerospace Conference (AeroConf), 2021 (in press). ▪ Detecting Image Forgery in single-sensor Multispectral Images, M. Gupta, P. Goyal, Soft Computing for Problem Solving, 2017 211-221. ▪ Data extraction from traffic videos using machine learning approach, A. Mittal, M. Gupta, I. Ghosh, Soft Computing for Problem Solving, 2017 841-852.
ACADEMIC ACHIEVEMENTS	<ul style="list-style-type: none"> ▪ Selected for regionals of ACM-ICPC, Amritapuri region, India 2015 ▪ 97.96 percentile in JEE-Advanced, India. 2013 ▪ 99.86 percentile in JEE-Mains, India. 2013 ▪ International Mathematics Olympiad, SOF, Delhi State Rank-9 and International Rank-125 2013
COMMUNITY SERVICE	<ul style="list-style-type: none"> ▪ National Service Scheme, IIT Roorkee 2013 – 2014 <ul style="list-style-type: none"> • A cleanliness drive was organised in the campus in which waste was removed from roads and was segregated as biodegradable and non-biodegradable. • The local vendors were convinced to buy bio-degradable carry bags made by our team at a nominal price and use them in place of plastic bags to discourage the use of plastic.
POSITION OF RESPONSIBILITIES	<ul style="list-style-type: none"> ▪ Head, Accounting Committee, HKN society, Purdue University 2020 <ul style="list-style-type: none"> • Helped the society keep a track of expenses ▪ Head, Initiation Committee, HKN society, Purdue University Spring 2019 <ul style="list-style-type: none"> • Planned and executed the initiation process for the incoming prospective ECE students ▪ Joint Secretary, Lights Section, IIT Roorkee 2015 – 2016 <ul style="list-style-type: none"> • Managed lighting effects in college cultural events and organized recreational activities.