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Naman Bansal

Education

Auburn University, Alabama, USA
Doctor of Philosophy, Computer Science and Software Engineering
Started from Fall'18

Indian Institute of Technology Gandhinagar, Gujarat, India
Bachelor of Technology, Electrical Engineering
GPA: 8.55/10

Research Interests

Computer Vision, Deep Learning, Computational Photography

Publications

Bansal, Naman and Raman, Shanmuganathan, **Regularized Tone Mapping Using Edge Preserving Filters**, in the *21st National Conference on Communication*, IIT Bombay, IN, Feb. 27- Mar. 1, 2015.

Research Projects

Classification of Imbalanced data using Deep Learning, University of Notre Dame
Supervisor : Prof. Nitesh Chawla, Director iCeNSA *May - July '15*

- Designed and implemented a solution to the class imbalance problem using stacked de-noising auto-encoders and pre-processing techniques such as SMOTE and Tomek links
- Obtained F-scores comparable to existing techniques such as CART and Random Forest

TMO for HDR Imaging, IIT Gandhinagar
Supervisor : Prof. Shanmuganathan Raman, Computer Vision Lab *Aug - Nov '14*

- Devised and implemented a new Tone Mapping Operator (TMO) for High Dynamic Range (HDR) Images using Matlab
- Used an edge-preserving filter (bilateral filter or WLS filter) and proposed an iterative solution to preserve the contrast and other minute details present in input HDR image

Time Delay Integration (TDI) Imaging, Space Application Centre, ISRO
Supervisor : Mr. Ashish Mishra, Head PCSVD *May - July '14*

- Simulated and analyzed the effects of non-linear platform characteristics and optical butting in TDI Imaging
- Quantified the distortions based on signal to noise ratio and modular transfer function
- Integrated the entire work in a simple GUI using Matlab GUIDE

Technical Projects

Copy-Move Forgery Detection
Supervisor : Prof. Nitin Khanna *Aug - Nov '15*

- Implemented block-based methods for copy-move forgery detection such as Zernike Moments, SVD, PCA, and KPCA

Non-Intrusive Load Modelling
Supervisor : Prof. Babji Srinivasan and Prof. Rajagopalan Srinivasan *Jan - March '15*

- Worked on non-intrusive load monitoring models for electricity consumption in buildings
- Wrote a Python script to collect electricity consumption data using EniMeter SCPM - T12

Low Cost X-Ray Detector, IIT Bombay
Supervisor : Achuta Kadambi, MIT Media Lab and Dr. Rajiv Gupta, MGH *24 - 31 Jan '14*

- Came up with the idea of using Selfoc lens array system present in flatbed scanner for the design of low-cost X-ray detector

Database Management System
Supervisor : Prof. Gaurav Srivastava *Nov - Dec '13*

- Programmed a Python script for maintenance of IITGN student database using SQLite

Technical Skills

Languages: C, C++, HTML5, CSS3, JavaScript, PHP
Scripts: Python, MATLAB, LaTeX
Libraries: TensorFlow, OpenCV, scikit-learn
Hardware Experience: Arduino, 8085 Microprocessor
Operating Systems: Windows, Linux

Relevant Courses

Linear Algebra (MIT OpenCourseWare)
Machine Learning - Stanford (Coursera)
Probability and Random Processes
Applied Multivariate Data Analysis
Algorithms, Part I - Stanford (Coursera)
CS231n (Stanford)
Signals and Systems
3D Computer Vision

Academic Highlights

- Recipient of Merit-cum-Means scholarship award for meritorious performance throughout the undergraduate program
- Featured thrice in Dean's List Award for Academic Excellence (IITGN)
- Recipient of the National Instruments Student Travel Fellowship for NCC 2015 conference
- Recipient of scholarship under Central Sector Scholarship Scheme (CSSS) for outstanding performance in XII Exams

Teaching/ Mentoring

Student Run Course
- Instructor of a **student-run course titled Applied Computer Programming**
- Covered the concepts of **curve fitting, interpolation, solution of linear systems of equations** using MATLAB and Python

Teaching Assistant
- TA for **Mathematical methods for engineers** course conducted by Prof. Mohan Joshi
- Developed modules for redundancy elimination in price indices of various commodities and a Progressive and Iterative approximation (PIA) approach for curve fitting

Student Guide for Freshmen Students
- Served as the first point of contact for freshmen in helping them settle in new environment
- Selection process involved evaluation of ethics and emotional stability of the applicant

Extra-Curricular Activities

IIT Gandhinagar Explorer's Fellow
- Recipient of **Explorer Fellowship**, unique to our institute
- Spent **seven weeks backpacking** across India at a meager budget of INR 800 per day

Badminton
- Member of **IIT Gandhinagar's Badminton team** in Sophomore and Junior year
- Represented the institute in **50th Inter IIT Sports Meet**, IIT Bombay (Dec 2014)

Event Marketing
- Marketing team member of institute's **Annual Technical Summit, Amalthea 2012**
- Helped increase the event footfall from 2000 to 6000

Drama Club
- An active member of institute's drama club **Abhinaya** in Freshmen and Sophomore year