**MUDIT JAIN**

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**TECHNICAL SKILLS**

* **Languages:** Python, C, C++, MATLAB, Bash
* **Technologies/Frameworks:** PyTorch, NumPy, Pandas, Scikit-learn, Git, OpenCV, Perforce, LATEX, CUDA.
* **Tools:** Jupyter, Google Cloud Platform / Colab, PyCharm, Vim, Visual Studio, Perforce, Linux, Jira, Jama, MS Office

**EDUCATION**

**University of California, San Diego** Sept 2019 - Mar 2021

Master of Science in E.C.E specialization in Machine Learning and Data Science| GPA: 3.66/4

Course Work: Deep Learning for Image Processing, Computer Vision, Statistical Learning

**Birla Institute of Technology and Science (BITS), India** Aug 2012 - July 2016

B.E. Hons in Electronics and Communication Engineering | GPA: 8.1/10

**WORK EXPERIENCE**

**UCSD,** Graduate Researcher and Teaching Assistant Sept 2019 - Dec 2019

\* Graduate Researcher in Drone Lab, UCSD :

\* Implemented custom stereo algorithms ( 16 path Semi Global Matching algorithm ) with hardware acceleration ( CUDA ).

\* Currently looking at real-time segmentation and silhouette based reconstruction from multi-view pts (multiple UAV scenario).

\* Graduate Teaching Assistant, Course: ECE 140A ( Art of Product Engineering ) :

\* This course integrates theory with practice. Our aim is to teach end-to-end software development, work with hardware and

sensors, and build a real product for real potential customers.

**NVIDIA,** Automotive System Software Engineer June 2016 - June 2019

\* Designed, implemented and tested the software pipeline of I2C Virtualization for ARM-based NVIDIA SoCs. Also did the

bring-up of the components on the FPGA and then on the SoC.

\* Optimized the bootloader and reduced boot-time by 50%. Implemented an O.S agnostic GPCDMA library. Also added HS400

support for SDMMC. Developed production tools that create OS firmware and boot the target in various modes.

**Google Summer of Code, Mentoring Organisation: RTEMS,** Developer March 2016 - June 2016

\* Ported FreeBSD SDMMC driver for RTEMS. Added DMA library for Raspberry Pi BSP, interfaced it with I2C & SPI drivers.

**ACADEMIC PROJECTS - Machine Learning**

**Domain Adaptation for Semantic Segmentation**  Sept 2019 – Dec 2019

\* Trained a state-of-the-art semantic segmentation model [ OCNet ] on Cityscapes dataset

\* To overcome the limited labeled dataset problem, we used domain adaptation to generate real-world like data from gaming

data, for that we trained a CycleGAN network to convert GTA data into real-world like data

\* Compared the results from OCNet trained only on Cityscapes dataset( 5000 images ) versus that of the network trained on

Cityscapes plus 5000 adapted GTA images. We observe that the model perf. increases a bit when trained on a larger dataset.

**Image Denoising using Deep CNNs** Sept 2019 – Dec 2019

\* Implemented DnCNN, UDnCNN( U-Net based CNN ) and DUDnCNN ( U-Net with dilated convolutions ) and compared

the validation performance of the nets for the problem of image denoising. Achieved accuracy of 99.6%, 99.7%, and 99.85%

respectively.

**Segmentation of Images using Bayes Decision Rule** Sept 2019 – Dec 2019

\* Implemented and applied the Expectation-Maximization algorithm to GMM’s in order to segment images into foreground and

background. Feature extraction was done using a Discrete Cosine Transform.

\* Compared the accuracy of such a model to Naive Bayes classification and experimented with different hyper-parameters such

as the number of clusters to further segmentation accuracy.

**ACADEMIC PROJECTS - Computer Vision**

**Sparse Stereo Matching & Naive Cam Scanner** Sept 2019 – Dec 2019

\* Implemented the Shi-Tomasi Corner detector to identify key features of an image. Concepts of epipolar geometry were used

to match features in a stereo pair of images based on a similarity score. Also implemented a cam scanner by using the

techniques of inverse homography to automatically warp a scanned image into one of the known dimensions

**3-D Reconstruction of Surfaces using Photometric Stereo and Surface Rendering** Sept 2019 – Dec 2019

\* Reconstructed 3-D surfaces under the assumption of known light sources and Lambertian material. Applied specularity

removal technique described by Mallick et al in order to account for Lambertian deviations. Approximated local illumination of

scene objects using the Phong Model and Lambertian Model.