Rahul Mishra
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Experience

- **DataSpace, NCSU, Libraries** — Raleigh, NC
  Data Science Consultant — *August 2019 - Dec 2019*
  - **Consultations**: Provide technical expertise and consultation to graduate and undergraduate students in fields like computer vision, machine learning, time series, and natural language processing.
- **Magic Leap** — Sunnyvale, California
  Computer Vision/ Deep Learning Intern — *June 2019 - August 2019*
  - **Domain Adaptation**: Built object detection network to learn domain independent features and used MMD to quantify the domain gap between different domain datasets. Quantification and analysis helped in improving performance by 4% for object detection.
  - **Synthetic Data Rendering**: Experimented with synthetic data by rendering the 3D models on random background scenes and use curriculum training to improve performance of 2D object detection system.
- **Texas Instruments** — Bangalore, India
  Design Engineer — *July 2016 - July 2018*
  - **Flow Automation**: Led DV for 36V MUX Family: Integrated and automated top-level design verification flow. Includes data analysis and common test-bench setup for the whole family of devices.

Projects

- **Human Pose Estimation from Monocular Images in the Wild**: Improved performance by 1.2 mAP to predict human joints' 3D coordinates in 2D Images using weakly supervised learning with SOTA High-Resolution Network as backbone.
- **Generated Synthetic Foraminifera from 3D Numerical Model (ARoS Lab)**: Used Blender+Python to generate forams synthetically to train domain adaptive network (transfer learning).
- **Visual Tracking Using Siamese Network**: Using SiamMask network to perform object tracking in online video at 12 fps on Quadro P1000 in PyTorch. Compared with different backbone architectures like Resnets and Alexnet.
- **Camera Calibration and Fundamental Matrix**: Estimated projection matrix using 3D world coordinates and 2D image coordinates correspondences. Estimated fundamental matrix using unreliable ORB matches with RANSAC.
- **Local Feature Matching in Images**: Used SIFT descriptors for the interest points found using Harris Corner Detector with adaptive non-maximum suppression. Used nearest neighbor distance ration to match them.
- **Face Detection Using Generative Modeling**: Compared performance of Gaussian, Mixture of Gaussian, t-distribution and Factor Analysis model in face image classification. Factor Analysis gave the best results.
- **Image Classification Using Memristive Nanowire Neural Network**: Achieved more than 80% accuracy in classification of MNIST dataset using Straight Wire Model with the constraint of non-negative sparse weights.

Education

- **North Carolina State University** — Raleigh, USA
  Master of Science in Electrical and Computer Engineering; GPA: 4.00/4.00 — *Aug. 2018 – May. 2020*
- **University of Delhi, Netaji Subhas Institute of Technology** — Delhi, India
  Bachelor of Engineering in Electronics and Communication Engineering; GPA: 9.12/10.00 — *Aug. 2012 – July. 2016*

Relevant Courses

Pattern Recognition • Neural Networks • Computer Vision and Deep Learning • Digital Imaging Systems • Topics in Data Science • Digital Signal Processing • Design and Analysis of Algorithms • Random Processes

Programming Skills

- **Languages**: C++, Python, Matlab **Software**: PyTorch, Keras, Tensorflow, OpenCV, Scipy, Pandas