ARUN PATRO

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EDUCATION

Indian Institute of Technology, Kharagpur 2013 - 2018
B.Tech. + M.Tech. in Electrical Engineering (Signal Processing)

WORK EXPERIENCE

CVIT, International Institute of Information Technology - Hyderabad Hyderabad
Research Fellow — Vision for Mobility September 2020 -

- As part of the **Vision for Mobility** lab, my focus is to improving object detectors and understanding the role of context to aid in scene understanding. I am working on robust object detection under partial occlusion of traffic objects. The goal is to solve for "Missing Traffic Object Detection" for the Indian Driving Dataset. This work aims to help public authorities improve the urban traffic infrastructure.

Myntra Designs Bangalore
Data Scientist — Data Science for Supply Chain Inbound Mar 2019 - August 2020

- **Style Grading**: Quantified the measure of new style's sales potential using a probabilistic model, trained on similar style's sales data. Grade score is the probabilitiy that the style's $CVR > CVR_{threshold}$. Led to a 10% improvement in Revenue Per Impression and catalouge health.
- **De-Duplication**: Scaled De-Duplication models based on triplet embedding networks to identify duplicate styles in the catalouge. This improved the platform and catalouge hygiene.
- **Regional Utilisation**: Modelled the optimal allocation of products to Myntra's principal warehouses considering the dynamic capacity of warehouses. Estimated the regional demand of the product using a 3-layer MLP and attributes of the products as features. Optimal Allocation computed using Integer Programming where the loss was the logistics cost of re-allocation.
- **Selection Gap**: Quantify optimal style width / catalog curation density of a cluster

Myntra Designs Bangalore
Data Scientist — Data Science for Image Sciences Jul 2018 - Mar 2019

- **AttnGAN**: Unsupervised text-to-image generation using Attentional Generative Networks. Used it to generate novel designs conditioned on natural language query. We showed that we can edit and mix-and-match specific attributes of the generated designs.
- **GAN Experiments**: Proposed different gradient measure loss functions for estimating noise vectors in GANs. Improved symmetry of generated shirts by imposing symmetry conditions on the GANs. Attempted to model generation of stripes in the striped images.

PUBLICATIONS

Intelligent Warehouse Allocator for Optimal Regional Utilization [link]
AI for Fashion Supply Chain Workshop, KDD 2020
Girish Sathyanarayana, Arun Patro

Let AI Clothe You: Diversified Fashion Generation [link]
Computer Vision - Workshops, ACCV 2018
Rajdeep H. Banerjee, Anoop Rajagopal, Nilpa Jha, Arun Patro, Aruna Rajan

Evaluation of Loss Functions for Estimation of Latent Vectors from GAN [link]
International Workshop on Machine Learning for Signal Processing (MLSP)
Arun Patro, Vishnu Makkapati, Jayanta Mukhopadhyay

Enhancing Symmetry in GAN Generated Fashion Images [link]
BCS SGAI International Conference on AI-2017
Vishnu Makkapati, Arun Patro

PROJECTS

3D Digitization of Humans for Size and Fit Estimation August 2020
with *Ankit Singh* et al.
Won a bronze medal at the annual Myntra Hackathon. We built a volumetric estimation of a Human using Open Pose and PIFuHD from FB. By taking two images of a person in tight fit clothes, we were able to estimate the size and fit of a person upto 1 inch accuracy.

Automated Fashion Generation using Generative Adversarial Networks 2017 - 2018
with *Vishnu Makkapati* and *Prof. Jayanta Mukhopadhyay*
Modelling DCGANs to improve quality of fashion images with periodic signals (stripes, checks, etc). Experimented with different GAN architectures and modified datasets for texture synthesis and analysis. Worked on inverting GANs to encode images in latent space, and create mix-and-match designs.

Blur Kernel Estimation using Deep Convolutional Networks 2016 - 2017
with *Dr. Rajiv Ranjan Sahay*
Estimation of guassian blur kernels to quantify the degree of defocus blur of non-uniformly blurred images. Trained CNNs to learn the blur parameter (sigma) of a gaussian blur from patches obtained from invariantly blurred textured images (Brodatz Dataset).

Autonomous Ground Vehicle Research Group 2014 - 2015
with *Prof. Devasish Chakravarty*
Detecting obstacles and lanes in grassy and city environments as part of the Computer Vision Team. AGV competes in Intelligent Ground Vehicle Competition and Mahindra Rise Prize.

SKILLS

Languages	English, Hindi, Odia, Python, JS, C
Data Science	Pytorch, Tensorflow Probability, Python for Data Science Stack
Courses	Computer Graphics, Computer Vision, Machine Learning, Deep Learning, Graphical Models, Signal Processing, Optimization, Image Processing, Copyright Law, Constitution Law

OUTSIDE WORK

I like electronic music, chess and swimming. Lately I have been playing chess and reading fantasy novels. In college, I was a governor of the english dramatics society - Encore (7 theater productions, 4 street plays).