Aniket Das

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Education

Indian Institute of Technology Kanpur

Kanpur, Uttar Pradesh, India

Bachelor of Technology in Electrical Engineering

July 2017 - PRESENT

- **Cumulative Performance Index** (CGPA) : **9.67 / 10.0**

Projects

Unsupervised Representation Learning on Video Data

Independent Research Project: [Code] [Report]

- Working on **deep generative models for learning meaningful latent representations from video data**
- Implementing **Disentangled Variational Autoencoder** architectures that can learn distinct latent variables for time invariant and temporal aspects of video data , allowing **disentangling of content and motion features**
- Studied and Implemented **"Disentangled Sequential Autoencoder" by Mandt et. al.** and proposed modifications to the architecture and the loss function for improved results
- Experiments currently under progress to create a similar model that performs well on datasets such as KTH by leveraging **learned and heirarchical prior distributions and discriminative training**, and to study similarity metrics in the latent space for robust unsupervised action clustering in videos

Deep Generative Models for Generating Visually Sparse Images

Dept. of CSE, IITK

Undergraduate Research Project under Prof. Vinay Namboodiri

- Working on **deep generative models for generating samples from distributions of visually sparse images** i.e. images with sparse visual detail such as architectural plans or black and white drawings of primary shapes
- Project currently in initial stage.Presently **benchmarking the Inception Score, sample quality and gradient flow in GANs** trained on a synthetic dataset of randomly generated rectangles
- Investigating techniques and architectural modifications such as **residual connections** for improving gradient flow

TorchGAN : A Lightweight PyTorch Framework For Easy And Efficient GAN Training

Independent Open Source Project : [Code]

- Developed a lightweight and highly customizable **PyTorch based framework for training and evaluation of Generative Adversarial Networks**
- Studied and wrote efficient implementations of several popular GAN losses such as **Minimax, Wasserstein GAN, Mutual Information Penalty, LSGAN, EBGAN, BEGAN, DRAGAN**
- Studied and implemented GAN evaluation metrics such as **Inception Score** and **Frechet Inception Distance**
- Created a highly customisable training loop that allows users to easily extend the framework to support their own custom architectures and losses with very little code
- Project currently in its alpha stage. Creation of a model zoo for the framework having implementations of popular GAN architectures like **SRGAN** and **CycleGAN** is currently in progress

Attention Based Models for Image Captioning and Generation

Programming Club, IITK

Summer Project : [Code] [Report]

- Studied the theory of encoder decoder networks, soft attention and hard attention
- Studied and reproduced the results in **"Show Attend and Tell : Neural Image Caption Generation with Visual Attention"**
- Created an image captioning network that generates robust one sentence descriptions of images by focusing on the relevant parts of the image as humans do while generating each word

Case Studies : A Legal Consultant Bot

Microsoft Hyderabad

Microsoft code.fun.do Hackathon on AI and Machine Reading Comprehension : [Code]

- Created a legal consultant bot that summarises a legal document, highlights the key phrases and answers some rudimentary questions about the document
- Created custom dataset by scrapinng from IndianKanoon.Org, Used **TextRank Algorithm for Text Summarisation** on large text corpora and **Latent Dirichlet Allocation** for topic modelling
- Used Microsoft Prose API and Bing Text To Speech to answer basic questions about the document. Deployed using a Django Backend on Microsoft Azure Cloud Platform
- Selected as one of the **top 3 ideas on campus by Microsoft Judges**

Skills

Languages , *Proficient :* C, C++ Java, Python *Familiar :*Julia, Bash, GoLang, Haskell, Javascript
Deep Learning Frameworks : , Tensorflow, PyTorch, Keras
Data Science Libraries :, NumPy, Pandas, Pillow, Scipy, Scikit-Learn, Gensim
Operating Systems, Windows, Ubuntu, Arch Linux
Utilities, Linux Shell Utilities, Git, Vim, Docker, LaTeX

Coursework

Introduction to Programming **A**$*$	Real Analysis **A**	Linear Algebra & ODE **A**
Data Structures And Algorithms i	Signals and Systems i	

A$*$: Grade for Exceptional Performance *i: In progress*

Honors & Awards

2018 **Academic Excellence Award**, Awarded to Top 5% Freshmen based on academic performance *IIT Kanpur*
2017 **All India Top 2 Percentile**, Joint Entrance Exam Advanced, 200,000 candidates *India*
2017 **All India Rank 240**, KVPY Scholarship, Indian Institute of Science and Government of India *Bangalore, India*

Interests

- Studying, implementing and reproducing the results of **deep learning research papers** in frameworks like **PyTorch** and **Tensorflow**, and experimenting with modifications that can lead to marginal improvements in accuracy or training time.
- Passionate about artificial intelligence and deep learning applied to the domain of computer vision, particularly **unsupervised learning, representation learning and deep generative models**
- Contributing to and maintaining open source machine learning projects on Github