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Amit Adate

Research Interests

Computer Vision, Deep Learning, Machine Learning, Optimization

Education

2020 – 2024 **Northwestern University, USA**.
Ph.D., Electrical Engineering
Advisor: Dr. Aggelos K Katsaggelos

2018 – 2019 **Northwestern University, USA**.
Masters of Science in Computer Science with Specialization in Artificial Intelligence
Advisor: Dr. Aggelos K Katsaggelos

2014 – 2018 **Vellore Institute of Technology, India**.
Bachelor of Technology in Computer Science
Advisor: Dr. B. K. Tripathy

Professional Experience

January 2019 – Present **Graduate Research Assistant**, *Northwestern University*.
Image and Video Processing Lab
Guide: Dr Aggelos K Katsaggelos

August 2017 – July 2018 **Undergraduate Research Assistant**, *VIT University*.
Soft Computing Lab
Guide: Dr B K Tripathy

May 2017 – July 2017 **Research Intern**, *CISCO Systems, Inc.*
Advanced Services Team
Worked on Large Scale Parallel Parsing (XML)

Selected Projects

Jan 2019 – Dec 2019 **Latent Space Optimization Framework for Conditional Generative Models**.
Ongoing Research Project, The current work is within optimization aspects of conditional generative networks towards the task of controlled image synthesis.

Sep 2019 – Dec 2019 **Pytorch Implementation of Dense Captioning**.
Ongoing Open Source Project, Pytorch implementation of Dense Captioning with Joint Inference and Visual Context trained on the Visual Genome dataset.

Sep 2019 – Dec 2019 **Introduction to Computer Vision Course Project**.
Project: Pose Tracking, The course led me to implement few algorithms from scratch using Numpy only. I implemented Morphological Operations, Hough Transformation, Histogram based Equalizaion and Segmentation, Ligtening Correction, Canny Edge Detection and Template based Image Tracking.

April 2019 – June 2019 **Experiments with Actor Critique Methods for Deep Reinforcement Learning**.
I performed a survey on existing approaches for a particular OpenAI gym environment, Bipedial-Walker-V2. Further, I found evidence of actor-critic methods dominating the baseline with a significant benchmark. My current implementation is built on top of the Asynchronous Actor Critique (A3C) Algorithm.

April 2019 – June 2019 **Seminar In Statistical Language Modeling Course Project**.
The course led me to read and summarize 40 selective papers that are popular contributed to Statistical language modeling. For the course project, I read and analyzed text to image model and built one from scratch. This course project also gave me a better understanding of the attention mechanism and the behind the scenes workings of transformers.

Sep 2018 – Dec 2018 **Google Analytics Revenue Prediction**.
This project is my contribution to a live Kaggle competition by Google. Google gave the task to predict the total revenue generated per customer based on the customer dataset of a Google Analytics Merchandise Store. In short, I have tackled a regression task

June 2017 – April 2018 **S-LSTM-GAN: Shared Recurrent Neural Networks with Adversarial Training**.
This project introduces a shared layer generative model. Recurrent networks are used to work with continuous data sequences, in this work, I combined them with the generative modeling mechanism and adversarial training to evaluate their receptive field towards the task of image generation.

Dec 2016 – Dec 2017 **Experiments with Generative Adversarial Networks**.
Experimented on the GAN framework to evaluate the performance of various image compression and image super-resolution techniques. I also worked with adversarial examples, specifically experimenting with generating noise that affects single image classification.

Selected Publications

ICDECT - 2017 *S-LSTM-GAN: Shared Recurrent Neural Networks with Adversarial Training.* **A Adate**, BK Tripathy - International Conference on Data Engineering and Communication Technology, 2017 **[Link]**

ICIIT - 2017 *Understanding How Adversarial Noise Affects Single Image Classification.* **A Adate**, R Saxena, Don.S - International Conference on Intelligent Information Technologies, 2017 **[Link]**

SOCPROS - 2018 *Understanding Single Image Super-Resolution Techniques with Generative Adversarial Networks.* **A Adate**, BK Tripathy - Soft Computing for Problem Solving, 2018 **[Link]**

Technical Skills

Programming

Python3, Matlab, C , C++ , LaTeX, Octave

Frameworks / Libraries

Pytorch, scikit-learn, OpenCV

Tensorflow, Keras , Nvidia CUDA - cuFFT and cuDNN

Selected Coursework

Graduate Machine Learning, Deep Learning Foundations From Scratch
Deep Reinforcement Learning From Scratch, Natural Language Processing
Seminar in Statistical language Modeling, Statistics for Life Sciences
Frameworks for Artificial Intelligence, Data Science Seminar

Undergraduate Soft Computing, Image and Vision Computing, Data Structures
Discrete Mathematical Structures, Linear Algebra, Statistics and Reliability, Graph Theory

External Machine Learning (Coursera), Nerual Networks for Machine Learning (Coursera),
Data-Structures Specialization (Coursera)

References

Available upon request