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EDUCATION

New York University: Master of Science: Computer Engineering | GPA 3.778/4.0 **May 2023**

Netaji Subhas Institute of Technology: Bachelor of Engineering: Instrumentation and Control | GPA 7.53/10.0 **June 2017**

RESEARCH EXPERIENCE

Scene Summarization, AI4CE Lab, New York University **Sept 2022 – Current**

➢ [**Python | NumPy |Matplotlib | Pytorch | Git| Self-Supervised learning**], **Supervisor: Prof. Chen Feng**

- Summarize a collection of single scene-level images to a small set of representative images using contrastive learning.
- Implement Momentum Encoder for frame representation and clustering the learnings.
- Compare ours's and existing methods on two metrics, GPS Variance (the scatterings of selected frames) and Neighbor Density (the quality of selected frames).

Predicting Spread of Metastatic Cancer Using Deep Learning, NYU Video Lab, New York University **Sept 2022 – Current**

➢ [**Python | NumPy |Matplotlib | Pytorch | Git| Monai| Image segmentation], Supervisor: Prof. Yao Wang**

- Analyze and present how metastatic brain cancer spreads sequentially based on the NYUMets dataset containing brain MRIs.
- Train different deep neural networks of UNet, and Spatio-temporal UNet architectures for cancer segmentation and compare them on Dice Score, Hausdorff distance, tumor vol, tumor count, per tumor vol, iou per class, and F-beta.
- Compare a variety of sequence processing deep learning architectures for time series analysis of brain MRIs.

TEACHING AND WORK EXPERIENCE

Introduction To Machine Learning Course Assistant, New York University **Sept 2022 – Current**

➢ Involved in creating and grading homework, and exam solutions for over 200 students. Regularly held office hours to clarify doubts. Lead coding/debugging sessions and engaged with students.

Real-Time Embedded Systems Course Assistant, New York University **Jan 2022 – May 2022**

➢ Involved in preparing course content and grading homework and exams for over 120 students. Regularly held weekly office hours for teaching and doubt clearances. Mentored students on their final project.

Software Engineer, GO-MMT Goibibo Group **Jan 2019 – Apr 2021**

➢ [**Python | DJANGO framework | Kafka| REST APIs | Redis | Crontab | MongoDB | Git]**

- Worked on Hotel vertical, which required reading through Kafka, creating and storing hotels object in MongoDB, and maintaining hotel data from different vendors through the backend (achieved nearly 100%).

- Worked on improving image selection and image processing criteria for Hotel Search Result Pages which increased image visibility from 78% to 97%.
- Developed APIs which were used by various other teams like front-end, and mobile apps as per their requirements, along with that, developed dashboards and panels for the easier and smooth working of the marketing team for their different events, offers, and other campaigns.
- Developed domestic and international destination verticals from scratch, handled Trains and Bus verticals as well and improved the overall SEO rankings, brought to 1 for many hotels and areas.
- Won 'Best Team' and 'Employee of the Quarter' at the annual town hall meeting.

Software Engineer, Bhavna Software India Pvt Ltd. **Jun 2017 - May 2018**

➢ [**Angular 2 | Typescript | C#| .Net| MySQL]**

- Worked on different operations associated with Lease modules like Create, Read, Update, Delete (CRUD), importing, exporting, and maintaining all lease records and associated data.

PROJECTS

Machine Learning/ Deep Learning Projects

➢ [**Python | NumPy |Matplotlib |MATLAB |Sklearn| Pytorch | Pyspark | Dask | Hadoop| OpenCV]**

- Developed Recommender Systems on the MovieLens dataset (Big Data of 58,000 movies and 2,80,000 users) based on baseline Popularity and Collaborative Filtering models. Based on the comparison metrics, improvements were evident. Precision increased by 3.2%, Normalized Discounted Cumulative Gain improved by 2.5%, and Catalog Coverage increased by 7.5%. Additionally, benchmarking was conducted to compare single-machine execution with cluster-based execution, which resulted in a 20.6% reduction in model fitting time and a 30.1% reduction in accuracy calculation time.
- Developed a GAN-based extension to Google WaveNet architecture to generate raw music of various emotions and genres using GTZAN, FMA, and GACMIS datasets.
- Implemented all the major architectures from scratch starting from LeNet, AlexNet, GoogLeNet, VGG, ResNet, Seq2Seq, Seq2Seq with Attention, Transformers, GANs, Image Segmentation, YOLO V1, and V3 to gain better insights.
- Developed Visual Place Recognition using the Bag of Visual Words model by computing SIFT features and applying K-means clustering to compute cluster centroids which were used as visual words in the histogram of visual words.
- Developed a relative pose estimation model based on two-view geometry. The model can be used to calibrate a camera, obtain the fundamental matrix, essential matrix, and orientation and translation between the images.

Real-Time Embedded System Project

➢ [**C |C++ | mbed.h | Gyroscope | STM32F429I-discovery board microcontroller | Assembly Language]**

- An affordable wearable speedometer was designed and developed that calculated linear velocity using angular velocities measured by a gyroscope, without requiring GPS. By strategically placing the sensor and microcontroller on the legs or feet, the angular velocities could be captured and, after some signal processing, converted into linear velocities and distance traveled (like a Fitbit or Apple watch, but with only a Gyroscope and no GPS). An accuracy of 86% was achieved.

TECHNICAL SKILLS

➢ **Programming and Frameworks**: Python (NumPy, Pandas, Matplotlib, Pytorch, Pyspark, Dask), Django, Hadoop, C, C++, Git

➢ **Databases:** MySQL, MongoDB