SHUVAM GHOSAL

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EDUCATION

Master of Science in Computer Science **Graduation Date: 12th May 2023**
Viterbi School of Engineering, University of Southern California, Los Angeles **GPA– 3.83/4**
Coursework: Machine Learning, Database Systems, Deep Learning and its Applications, Web Technologies, Advanced Computer Vision, Autonomous Cyber-Physical Systems, Analysis of Algorithms

Bachelor of Technology in Computer Science and Engineering **July 2021**
Institute of Engineering & Management, Kolkata, India **DGPA– 9.56/10**

SKILLS

Machine Learning, Deep Learning, Computer Vision, LLM, GenAI, Retrieval Augmented Generation (RAG), Langchain, Vector Databases, LlamaIndex, Prompt Engineering, Tensorflow, Scikit-learn, Numpy, Pandas, PyTorch, Google Cloud, Python, Java, HTML, Javascript, CSS, Angular, Node.js, Boostrap, Typescript, Flask, JUnit, Mockito

EXPERIENCE

Application Developer Intern, Automatic Data Processing Inc. (ADP), Pasadena, CA **June 2022 - August 2022**

- Added a feature providing relevant data to the frontend for augmenting the UI, enhancing user experience by **15%**
- Carried out bug fixing and implemented error handling classes for the backend, improved error handling performance by **20%**
- Created test cases for existing and new backend features using JUnit and Mockito

Project Engineering Intern, Rebaca Technologies Pvt. Ltd, Kolkata, India **April 2019 –May 2019**

- Developed a 2-layered Stacked LSTM (Deep Learning) Model called **Deeplog** in **PyTorch** from a research paper.
- Applied the model for an Anomaly Detection task on a series of log keys generated by a Tomcat Server.
- Improved the detection of crucial anomalies by **30%** and reduced the number of false positives by **20%**

PROJECTS

Suspicious Activity Detection using Human-Object Interactions and Dense Video Captioning **February 2022 - May 2022**

- Developed a deep-learning based computer vision model for detecting suspicious or criminal activities in CCTV footages
- Leveraged Human-Object Interactions (HOI) detection using Detection Transformer(DETR) to enhance prediction
- Combined the HOI features with the visual i3D features of the Bi-Modal Transformer (BMT) model in a sequential manner for generating less-redundant yet detailed captions to yield better classification results and higher BLEU scores

Digitalization of Renaissance Paintings (Undergraduate Final Year Project) **May 2021**

- Devised a deep-learning model for transforming old Renaissance color portraits to their realistic modern digital photographic versions
- Modified the **pixel2style2pixel**(pSp) model architecture based on the StyleGAN model and trained the model on the CelebA-HQ Dataset, created a dataset of renaissance portraits and fine-tuned some of the **style** varying parameters of the model based on it to achieve more realistic outputs

Car Damage Detection Model using Mask R-CNN **March 2021**

- Customized a Mask R-CNN model used for detecting three frequent types of car damages – scratch, bullseye and crack
- Trained the model on a custom dataset containing images of damage of the three classes and achieved an accuracy of about **90 – 95%**.

Face Generation from Corrupted Images **August 2019 - September 2019**

- Prepared a Generative Adversarial Network (GAN) model for generating actual images of celebrities from corrupted images (Image Inpainting).
- Accomplished the task by converting the `vanilla` generator model of the GAN to a denoising autoencoder along with the classical discriminator which yielded appreciable results.
- Trained the model on the CelebA HQ dataset and preprocessed the images by creating random black patches on the celebrity images before feeding them to the GAN generator model

Intelligent auto-responding software for emails **December 2018 - January 2019**

- Formed a team of two to develop a software for creating and sending content-based auto-responses to clients' emails
- Incorporated Machine-learning models like Logistic regression and a self-supervised approach to improve the software's efficiency with time
- Leveraged the gensim module in Python to apply NLP techniques on the clients' queries
- Used a translator API to translate other languages into English as a preprocessing step

PUBLICATIONS

- Majumdar, Shatadru, Soumik Kumar Nandi, Shuvam Ghosal, Bavrabi Ghosh, Writam Mallik, Nilanjana Dutta Roy, Arindam Biswas, Subhankar Mukherjee, Souvik Pal, and Nabarun Bhattacharyya. "Deep Learning-Based Potential Ligand Prediction Framework for COVID-19 with Drug–Target Interaction Model." *Cognitive Computation* (2021): 1-13

INVOLVEMENT

- Led the implementation part in a team of 2 in TCS Inframind 2018-2019 contest and reached the Semi-final round