205 Springville Ave,
Buffalo, NY -14226

ABHISHEK KUMAR

+1 716-604-4649
akumar58@buffalo.edu
https://www.linkedin.com/in/akumar58

EMPLOYMENT

Computer Vision Researcher — **IAD (SRI-UB team)** — **Sept 2022 – Aug 2023**

- Built CNN model to detect tampered images by analyzing JPEG compression errors with ~ 94% accuracy.
- Researched on constrained convolutions to localize manipulations in news images using noise and edge features.
- Developed object labelling module to label small objects within manipulated regions in images using YOLO.
- Designed a baseline model to detect multimodal (image & text) inconsistency in online news articles.
- Developed text transformer tool that performs controlled text replacements to create multimodal inconsistent data.

Teaching Assistant — **University at Buffalo** — **June 2022 – Aug 2022**

- Guided students to develop deep learning projects for video analysis in sports domain for CSE 701/702.
- Conducted classes, graded assignments, and reviewed students' technical presentations.

Software Engineer — **Infosys** — **Feb 2018 – Aug 2020**

- Developed task delegation system for PLM application in Python to manage production workflows for CUMMINS.
- Built REST API in Flask to parse delegation data from JSON files received in hourly batches.
- Automated batch jobs with robotic process automation reducing transfer failure rate by 20%.
- Designed Pricing System for Fleet Guard parts in Java to ensure accurate and reliable data management.
- Implemented efficient shell scripts for data extraction, parsing and transfer across 6 pricing interfaces.
- Managed deployment and maintenance pipelines using Jenkins and Git ensuring system availability and reliability.

EDUCATION

Buffalo, NY — **University at Buffalo** — **Sept 2021 – Aug 2023**

- M.S. in Computer Science and Engineering, (Machine learning and Computer Vision), GPA: 3.72/4.0
- Graduate Coursework: Machine Learning, Deep Learning, Computer Vision and Image Processing, Video Analytics, Information Retrieval, Design and Analysis of Algorithms, Distributed Systems.
- **Thesis** : Forensic Methods to Detect Manipulated News Media. https://github.com/abhinine4/news_forensics

PROJECTS https://github.com/abhinine4

- **Temporal Action Spotting** (2023) : Implemented a transformer based model with multiscale flow and RGB features to classify actions and identify temporal boundaries for 17 action classes. Achieved 52 % mAP and ranked 5th in Soccernet competition. Pytorch, transformers, boundary regression, action classification.
- **Ear Hair-Cell Detection** (2022) : Developed machine learning model to detect and segment inner and outer damaged ear hair cell in animals to measure deafness. Python, template matching, non-max suppression, clustering.
- **Person Re-Identification** (2022) : Designed a deep learning model to re-identify soccer players in broadcast videos to create automatic highlights. Pytorch, C++, transfer learning, ResNet, OpenPose, bilinear pooling, triplet loss.
- **Image Denoiser** (2022) : Built a convolutional neural network model that uses residual learning to remove gaussian noise from images and improve image resolution. Pytorch, CNN, image residuals, batch normalization.
- **Automatic Panoramas** (2021) : Created a model to stitch stereo image pairs using SIFT feature descriptors and projective transformation to build panoramas. Python, k-NN ratio testing, RANSAC, OpenCV, Linear Algebra.
- **Other** : Camera calibration, Camera pose estimation(rotation and translation) , Point cloud segmentation using local feature aggregation for autonomous driving, Object tracking using optical flow (Lucas-Kanade), Video processing, Image indexing and searching

SKILLS

Languages : Python; C++; Java; SQL; Html/CSS, (familiar) Golang; React.
Libraries : PyTorch; TensorFlow; OpenCV; NumPy; Pandas; Scikit-Learn; AWS; Git; Docker; Flask.
Computer vision : Stereo, Epipolar geometry, Homography, Rotation, 3D reconstruction, Camera calibration, SIFT.
Machine / Deep learning : CNN, Attention, Transformers, GANs, Constrained Convolutions, SVM, PCA, Random Forest.
Databases : MySQL; MongoDB; Oracle; Solr, ElasticSearch.