Aditya Bhat

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SUMMARY

Computer Vision and Deep Learning Engineer with 3+ years of industrial and research experience with hands-on experience in Pytorch, TensorFlow, OpenCV, and Unity3D. Skilled in Detection, Tracking, Segmentation, Camera calibration, and Game development

EDUCATION

MSc In Computer Science(Specializing in Computer Vision) | Rutgers University, New Brunswick, NJ | CGPA: 4.0 **Sep 2021 - May 2023**

BE In Information Science| BMS Institute of Technology Bangalore, India **Aug 2013 - Jun 2017**

SKILLS

Language: Python, C++, SQL. | ***Editors***: Unity 3d , Google Colab, Jupyter Notebook, Pycharm, Spyder, Visual Studio

Frameworks: PyTorch, Tensorflow, OpenCV, Numpy, Matplotlib, scikit-learn, skimage, PIL. | ***Models***: Detectron 2, YOLOv5, Mask RCNN,

RESEARCH EXPERIENCE

INTELLIGENT VISUAL INTERFACES LAB, Rutgers University **New Jersey, US**

Human Group Activity Recognition Using Synthetic Data. **Aug 2022 - Current**

- Worked on Unity's Perception Package to generate over 10000 simulations for Multi-Actor, Multi-Group, and Multi-View of people performing different activities such as walking, talking, dancing, queueing, running, etc.
- Generated simulations are capable of providing 2D and 3D tracked individual bounding boxes, semantic and instance segmentation masks per frame, COCO keypoint labels per frame, individual atomic action class labels, and group activity class labels
- Tested state-of-the-art research papers such as Composer and Actor Transformers.

WORK EXPERIENCE

Nokia Bell Labs **New Jersey, US**

Applied AI/ML Machine Vision Intern **Jun 2022 - Aug 2022**

- Calibrated multiple cameras at the Nokia Bell Labs facility and computed the homography matrices by manually measuring the ground truth to check the performance of the resultant estimation.
- Developed a custom lightweight classification model to detect the occlusions in the robots and achieved a test accuracy of 95%.
- Used detectron2 to reconstruct the occluded bot by implementing a keypoint detection model by annotating over 2000 images of a bot for 9 key points, i.e head, 4 corners, and 4 corresponding wheels. This also helped in determining the level of occlusion.
- Worked on the multi-camera tracking system and combined the localized estimates of objects of interest from multiple cameras using a scoring system that assigns scores based on the area of detected bbox and level of reconstruction required (if the object is occluded)

Thinking Stack **Bangalore, India**

AI/ML Engineer **Oct 2020 - Jun 2021**

- Developed over 5 custom YOLOv5 models for detection of safety PPE kit by manually annotating over 5000 images and training with up to 4 augmentation techniques achieving an overall mAP value of 0.81.
- Built an augmentation pipeline to improve model performance by taking in the image dataset, processing it, and augmenting the image classes that are lower in number. This helped in raising the model's accuracy by 10%.
- Created activity recognition system which took body key points as input(using 'posenet') and LSTM network to predict the activity. Training data was generated using Unity3d by animating a human character.

DHS Informatics **Bangalore, India**

Machine Learning Intern **Feb 2020 - Jul 2020**

- Developed Furniture selection/placing App using Unity3d and ARCore. All the 3D models of furniture were stored within the app for users to select. The position of the screen tap was recorded to instantiate the furniture with moving and scaling options to mimic the actual furniture. (POC)
- The furniture selection app was further extended to build an AR home application to facilitate architects to augment their housing plan in an empty area to visualize how it would look once developed. The 3D model of the house was preloaded in the app.
- Developed a drowsiness detection system by tracking the eye of the person by extracting facial points. The status of the driver is determined by calculating the Euclidean Distance between the top and bottom points of the eye.

Oracle Financial Service Software **Bangalore, India**

Technical Analyst **Jun 2017 - Mar 2019**

- Guided and validated MOS automation and installation of a Behaviour detection package to the clients which generate alerts and cases based on scenario rules set by the bank.
- Worked on SQL and PL/SQL to resolve bugs reported by customers and followed up with the development and Product Management Team, managed client calls, fixed product bugs, and ensured customer satisfaction with quick responses and solutions.

PERSONAL PROJECTS

Virtual Try-on(*Used language and libraries: Unity3d Python, PyTorch)*

- *Followed VTON HD paper and the customized Preprocessing and Segmentation generation blocks. Used Unity3d to develop the frontend which lets the user select the cloth and upload their image which is then passed on to python(API) where the person's image and the reference cloth is fed to the model for the processing which outputs the image of the person wearing the cloth.*

.**Home-based Patient Rehabilitation And Monitoring(***Used language and libraries: Python, mediapipe, Tensorflow)* (On-Going)

- Used Unity3D to generate simulations of walking, sitting, eating sleeping, falling, etc, and passed to the LSTM model to detect patient's activity and generate the daily report (normal or abnormal activity)