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Basil K Jose **ML Engineer**

PROFESSIONAL SUMMARY

- Experienced in the field of Machine learning, Deep learning, Data analysis, and computer vision.
- Hands-on experience in Machine learning and Deep Learning Framework such as, Scikit learn, TensorFlow, Keras, NLTK and OpenCV.
- Deep understanding of image processing algorithms.
- Experienced in building Web APIs using Flask.
- Practical knowledge of Deep learning architecture such as ANN, CNN (Convolutional Neural Networks), RNN (Recursive Neural Networks) and LSTM (Long Short-Term Memory).
- Worked on use cases that involve Object Detection, Image Segmentation and image classification from incoming real time data.
- Experienced in using Statistical and LSTM models for time series forecasting problems.
- Hands on Experience in working with Data Visualization libraries like matplotlib, Seaborn, Plotly.
- Experienced in using Instance segmentation and Semantic segmentation models to locate objects in images.

EDUCATIONAL QUALIFICATION

B.Tech – Computer Science, Cochin University of Science and Technology 2015-2019

TECHNICAL SKILLS

- Programming Language: Python
- Computer Vision Frameworks: OpenCV
- Machine Learning Frameworks: TensorFlow, Keras, Scikit learn, PyTorch
- Deep Learning: CNN, RNN, LSTM
- NLP Frameworks: NLTK
- Database Technologies: MySQL
- Web Services: Flask
- Development Tools: Jupyter Notebook, Visual Studio
- Code Management: GitHub
- Operating System: Windows, Linux
- Others: Pandas, NumPy, Matplotlib, Seaborn

WORK EXPERIENCE

ML Engineer, OptiSol Business Solutions Dec 2021 - current

Achievements/Tasks

- Worked on different Computer Vision use-cases like Power Pole Maintenance, Infant Diaper-size prediction etc.,
- Worked on Backend APIs for object detection/segmentation training and inference pipelines, created Micro-services using Flask APIs.
- Working on model building and optimization.
- Working on high level python file handling like JSON, XML in data preparation.
- Developed object detectors using TensorFlow and PyTorch Object detection (YOLO and MM Detection) and integrated to Flask APIs.

Data Scientist, Apes AI India Pvt Ltd, Kochi, Kerala Jan 2020 - Dec 2021

Achievements/Tasks

- Worked with fire, smoke, and PPE (Personal Protective Equipment) detection using yolov5 models.
- Collecting open-source data available and filtering data based on problem statements.
- Developed a model to detect NSFW images, blur, and blank images with the help of some existing solutions.
- Assisted in problem-solving and brainstorming solutions to existing concerns.

PROJECT PORTFOLIO (INDICATIVE LIST)

Automated utility and power pole maintenance

Technology: Python, RESTful APIs (Flask), MySQL, Computer vision, TensorFlow, PyTorch and React.

Description:

- A computer vision platform for image segmentation and detection (Instance, semantic, YOLO and MM Detection)
- Engineered a logic to measure power pole violations from outputs of segmentation models.

- Calculate visual distance measurements capabilities like getting the pole height using pixels, finding the distance between one object to another, checking the distance between top and bottom wire etc.,

Roles and Responsibilities:

- Working on image segmentation such as Instance and Semantic to detect Pole, wires and other joint use objects.
- Worked on object detection using YOLO and MM Detection.
- Worked on OCR to extract the text from the pole tag.
- Working on measurement logics using pixel per metrics logic to find the distance between the objects, wires etc.,
- Worked on Integrating Tensorflow and PyTorch framework into the pipeline.

Fire, Smoke and PPE Detection - Alarm system

Technology: Python, Flask, Object detection model(yolov5), Computer vision, Data Annotator and OpenCV

Description:

- To detect if the employee is using PPE in the work zone, the PPE model is also trained in fire and smoke data.
- Whenever an alarm is detected, it will be sent to the client side.
- We use computer vision models like yolov5 for detecting objects from real time CCTV videos.

Roles and Responsibilities:

- Collected open-source data available and extracted image frames from existing CCTV videos.
- Label images using data annotation tools.
- Trained the yolov5 models, inference results and improved the model.
- Developed a python flask API app to identify PPE, smoke, and fire from live CCTV video.

NSFW Filtering System for Kids App

Technology: Python, Flask, OpenCV, TensorFlow, Keras

Description:

- To filter out NSFW (Not Safe for Work) images and blank images coming to the App server in real-time.
- Users will be uploading various kinds of images to the App in real-time. We must monitor the content of the image and block if the image is NSFW and pass the image to the server if it is SFW.
- Aim of the project is to first detect blank images and then classify these input images into NSFW and SFW, and finally pass only SFW category of images such as flowers, drawings, sceneries, etc.

Roles and Responsibilities:

- Worked on data collection for the required problem and data processing.
- Trained different deep learning models to get the best solution.
- Built a pipeline to classify the images into NSFW or SFW using deep learning model.

Cotton Disease Prediction

Technology: Python, Keras, Flask, Inception_v3

Description:

- This is an image classification problem; Model wants to detect the diseased cotton leaf and plants.
- The inception model (transfer learning) helps us predict whether these images of the leaf/plant belong to the diseased category or the healthy category.

Infant Diaper Size Recommendation Using PoseNet

Technology: Python, TensorFlow, OpenCV,

Description

- Built an iOS mobile App running PoseNet in TFlite to measure the height of an infant by referencing the pixels against a standard sized object such as an A4 sheet and recommend the correct diaper size.

CERTIFICATIONS

- Applied AI course
- Python for Data Science and Machine Learning Bootcamp -Udemy
- SQL For Data Science - Udacity
- Version Control with Git- Coursera
- Introduction to Machine Learning in Production - Coursera

PUBLICATIONS (Blogs)

- Twint: Twitter Scraping Without Using Twitter's API
  (basilkjose.medium.com)
- Time Series Forecasting using LSTM
  (basilkjose.medium.com)
- Natural Language Preprocessing: Steps for Text Data Preprocessing
  (basilkjose.medium.com)
- Reducing Commercial Aviation Fatalities
  (basilkjose.medium.com)