BALAHARI VIGNESH BALU

DEEP LEARNING|IMAGE PROCESSING | SENSOR FUSION
LOOKING FOR AN EXCITING ROLE TO WORK WITH PERCEPTION
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SKILLS

- Programming Languages: C, C++, Python

- Specializations: Object Detection & Tracking | Computer Vision | OpenCV

- Deep Learning: PyTorch|Tensorflow Pandas|Numpy|Sci-Kit|Seaborn|MatPlotLib CNN| CUDA

- Tools: Jupyter Notebook, Google Colab, MS Visual Studio, Visual Code, Anaconda Navigator, Pycharm

- Other Technologies: Git, Docker, Linux, Singularity, ROS(Starter)

CERTIFICATIONS

- Sensor Fusion Engineer (Udacity)
- Robotics Software Engineer (Udacity – in progress)
- Computer Vision Nanodegree(Udacity – in progress)

EDUCATION

MASTER'S IN APPLIED COMPUTER SCIENCE
SEPTEMBER 2019 - PRESENT
SRH Hochschule, Heidelberg, Germany (1.6)

BACHELOR'S IN COMPUTER SCIENCE AND ENGINEERING
JULY 2011 - MAY 2015
Anand Institute of Higher Technology, Chennai, India (7.22/10.0)

WORK EXPERIENCE

MASTER THESIS • *FRAUNHOFER INSTITUTE FOR COGNITIVE SCIENCE*
JUNE 2021 – PRESENT
- Implementation of Evaluation metrics and Key Performance Indicators for Object detection as part of safety framework.
- Proposed and implemented new metrics in 2D Object detection to gain more insights from a Safety Perspective.
- Introductry knowledge on SOTIF and to identify important KPIs to judge performance of DNNs from Safety perspective.

RESEARCH INTERN • *FRAUNHOFER INSTITUTE FOR COGNITIVE SCIENCE*
FEBRUARY 2021 – MAY 2021
- Research for state-of-the-art object detection networks \ frameworks to train and infer on automotive datasets.
- Research to discover detection of Out-Of-Distribution data without major changes on object detection networks.

SOFTWARE DEVELOPER-INTERN • *BAYES LABS*
MARCH 2019 – JUNE 2019
- Co-organised boot-camps focused on Machine/Deep Learning as a part of Bayes Labs meetup community.
- Created iPython Notebooks for the participants to work using Google Collaboratory to acquire introductory knowledge across different applications of deep learning.

SOFTWARE DEVELOPER-INTERN • *DAZTA TECHNOLOGIES*
AUGUST 2017 – MARCH 2018
- Performed Exploratory Data analysis using Numpy, Pandas, Matplotlib libraries in Python. Developed machine-learning models on the explored data.

- Convolutional Neural Networks in TensorFlow
- Deep Learning (One Fourth Labs)

LINKS

- @ [BalahariVignesh](#)
- @ [Balahari Vignesh](#)
- @ [balahariVignesh.github.io](#)

LANGUAGE

- English
- German
- Tamil

HONORS & AWARDS

- STIBET Scholarship for exceptional academic performance

HOBBIES

- Cycling – Completed more than 1500kms of cycling around Heidelberg.
- Running – Completed 7 marathons in 2019

PROJECTS

RESEARCH PROJECT ON EFFECT OF BACKBONE ARCHITECTURES & BASIC CV TECHNIQUES ON CNN

- Designed CNN models to study the effect of convolutions across different layers.
- Implemented edge detectors and compared with results of convolutions and the impacts of using image pyramids.
- Compared basic backbone architectures such as AlexNet, VGG and ResNet.

GERMAN TRAFFIC SIGN RECOGNITION

- Developed a multi-class image classifier for recognizing German Traffic Signs.
- Implemented a CNN architecture on TensorFlow framework and Fine-tuned hyper-parameters to achieve better validation accuracy.

CAMERA 2D FEATURE TRACKING

- Implemented different detector and descriptors in OpenCV.
- Implemented state-of-the-art keypoint detectors such as HARRIS, FAST, BRISK, ORB, AKAZE and SIFT, and their performance was compared.
- Performed Descriptor extraction and matching using Brute force and FLANN approach.
- Evaluated different combinations of detectors + descriptors based on their performance and identified the best combinations.

3D OBJECT TRACKING

- Detected and tracked objects in 3D space from the KITTI Dataset based on camera and lidar measurements.
- Computed time-to-collision based on the data from Camera and LiDAR sensors and compared the results.
- Identified the best Keypoint Detector + Descriptor combinations for object tracking and Time to Collision Computation.

TO PRESERVE DRIVER'S VIGILANCE BY MONITORING HEAD AND EYE GAZE DIRECTIONS FOR DROWSINESS DETECTION

- Developed an active safety monitoring technique for Bachelor thesis using OpenCV to detect drowsiness by continuously monitoring head and eye gaze directions.
- Implemented using Haar Cascades for face detection and tracked eye lid movements to count eye blink rate.
- Deployed a seat belt vibrator to alert driver using Arduino and also alerted with audio signals.