Somasundaram S.

Datascientist

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Data scientist with more than 7 years of experience in the field of Artificial Intelligence and Digital Image Processing. Skilled in optimization and porting various AI models on to edge devices. Passionate to solve challenging problems in the computer vision domain.

Skills

- Python • Computer vision • Image processing • Artificial intelligence • C++
- Object detection • Segmentation • Machine learning • Pytorch • Numpy

Work history

03/2020 - Present ***eInfochips (An Arrow Company)***

Snapdragon

- A facial recognition system was developed using Mobilenet, Facenet and Extreme value machine (EVM) models.
- The model was trained to classify known faces with 96% accuracy and unknown faces with 99% accuracy on the LFW dataset.
- AI models were optimized using the Snapdragon Neural Processing Engine (SNPE) and ported on to GPU and DSP runtimes.
- An Android application was developed to recognize faces on the Snapdragon 845 board (smartphone platform).

Nvidia

- A face recognition pipeline was developed and deployed on the Nvidia Jetson Xavier AGX board using MTCNN, Facenet and EVM models.
- The model can identify unknown and known faces with an average accuracy of 96% on well-known datasets like LFW and VGGFace2.
- The model is optimized using the TensorRT module, improving the inference speed 10-15 times.

08/2014 – 03/2020 ***Sandvik Asia Pvt. Ltd., Pune***

Patent : EP18173333.8 (Under review in EPO)

- An inspection system for inspecting the internal surface of tubes was designed and developed.
- A light and efficient Convolutional Neural Network model was designed & trained to automatically identify and classify 5 different types of defects using bounding boxes.
- The CNN algorithm can identify defects of size ranging from 500 micron to a few millimeters.
- The algorithm was optimized to run on an edge device with at least 15 fps, making the inspection system work real time.

Customer Projects

03/2020-06/2020 ***Optimization of fingerprint enhancer model***

- Fingerprint enhancer model (U-net) was ported to Snapdragon 845 board
- Layer wise performance of the model was captured on different runtimes (DSP, GPU, CPU)
- Suggestions to improve the performance of the model were provided
- An Android application was developed to execute and display the throughput of the model

04/2021-06/2021 ***Automatic Recency test result identification - POC***

- Recency test uses a strip to identify if a patient has HIV positive or negative
- Lines that appear after test are identified using image processing techniques
- The developed algorithm is able to predict 3 situations, HIV +ve, recent +ve & -ve with 99 % accuracy

Masters Projects

08/2011-08/2014 ***Image processing-based flow visualization and velocity measurement***

- Particle image velocimetry technique is used to visualize the flow and the images captured are processed to find the magnitude and direction of the flow.
- The pattern of the flow particles is tracked to calculate the displacement in terms of pixels. A contour is developed in a 2-D plane after processing the images
- Threshold techniques were used to capture the diameter variations of an evaporating droplet
- Conventional image processing techniques were used to create and evaluate a spatially uniform background illumination for imaging and particle sizing applications

Patents & Journals

- Somasundaram, S. Sarkar, et. al., Tube inspection system, WO2019219956A1, filed: 21st November 2019
- Somasundaram S., et. al., Evaporation-induced flow around a pendant droplet and its influence on evaporation, physics of fluids, 2015.
- Somasundaram S., et. al., A fluorescent laser-diffuser arrangement for uniform backlighting, Measurement science and technology, 2016

Education

07/2011 – 08/2014 ***Master of science*** *CGPA : 8.8*

Indian Institute of technology, Madras

06/2007 – 04/2011 ***Bachelor of Engineering*** *CGPA : 9.01*

Sri Ramakrishna Engineering College, Coimbatore