MUHAMMAD MAAZ

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PERSONAL PROFILE

I am a Computer Vision engineer with hands-on experience in research, engineering, deployment and monitoring phases of Deep Learning driven Computer Vision products. I am currently working on Multi-modal understanding from vision and text to improve common-sense reasoning of machines and its applications in long-tail open vocabulary object detection. I am also working on developing light-weight general purpose efficient networks for mobile devices.

PUBLICATIONS

Class-agnostic Object Detection with Multi-modal Transformer *Mar 2022 (under review)*

***Muhammad Maaz**, Hanoona Rasheed, Salman Khan, Fahad Khan, Rao M. Anwer, Ming-Hsuan Yang*

In this work, we explore the potential of the recent Multi-modal Vision Transformers (MViTs) for class-agnostic object detection. Our extensive experiments across various domains and novel objects show the state-of-the-art performance of MViTs to localize generic objects in images. We also develop an efficient and flexible MViT architecture using multi-scale feature processing and deformable self-attention that can adaptively generate proposals given a specific language query.

EDUCATION

Mohamed bin Zayed University of Artificial Intelligence, UAE *Dec 2020 - Continue*

Research Based Masters in Computer Vision

CGPA: 4.0/4.0

University of Engineering and Technology, Pakistan *Sep 2014 - Aug 2018*

B.Sc. Electrical Engineering

CGPA: 3.7/4.0 (First class with honors)

WORK EXPERIENCE

Hazen.ai *July 2020 - Dec 2020*

Computer Vision Engineer

Developed a traffic light phase detection solution for road safety applications. I trained a network to learn embeddings for traffic light phases (red, yellow, green and black) using triplet loss. The network was robust enough to handle different road scenarios including day and night scenes. The product was deployed on the NVIDIA Jetson devices using TensorRT.

Confiz Limited *Jun 2018 - July 2020*

Computer Vision Engineer

Led Shopper Value - Computer Vision Team where I was responsible for technological evolution and scalability of Computer Vision Products; Visitor Tracking and Visitor Profile.

- **Visitor Tracking:** A Person Detection and Tracking solution to identify the engaged and ignored areas of a retail store. Our utmost challenge was to process 7 to 10 video streams on an i5 CPU or NVIDIA Jetson device with fair enough accuracy. We experimented with Yolov3 and pruned it to get the desired speed and accuracy balance. We used Network Distillation to train camera specific small neural networks. We also focused to effectively utilize the CPU cores and use optimized inference frameworks like Intel's OpenVino and TensorRT for edge deployment.

- **Visitor Profile:** A face recognition solution capable of generating visitor's and buyer's demographics and visit frequency data for the brick and mortar retail stores. FaceNet like architecture was being used to prepare face embeddings.

Mentor, A Siemens Buisness *Jun 2017 - Aug 2017*
Software Engineer

During the stay, I developed small multithreaded applications, created Linux distribution following the LFS document, built customized Embedded Linux for Raspberry Pi using Yocto project, learned about cross-compilation and wrote a GPIO device driver for Raspberry Pi embedded board.

RESEARCH PROJECTS

Self-supervised Learning for Fine-grained Visual Categorization *May 2021*
***Muhammad Maaz**, Hanoona Rasheed, Dhanalaxmi Gaddam*
The work studies the effectiveness of Self-supervised Learning for Fine-grained classification task. We explore the effectiveness of various self-supervised pretext tasks including rotation, pretext invariant representation learning (PIRL), and deconstruction and construction learning (DCL) for Fine-grained classification.

Intelligent Discipline Maintaining System *May 2018*
***Muhammad Maaz**, Osama Nasir, Tahir Mahmood, Waqar Ahmad*
The project focuses to build a real time discipline violation identifier by processing video and audio feeds. The identified discipline violations are door slamming, whistling and smooking.

CERTIFICATES

Computer Vision Nano Degree *Udacity*

Deep Learning Specialization by deeplearning.ai *Coursera*

Machine Learning with TensorFlow on Google Cloud Platform Specialization *Coursera*

Advance Machine Learning with TensorFlow on Google Cloud Platform Specialization *Coursera*

TECHNICAL STRENGTHS

Computer Sciences	Computer Vision, Deep Learning, Machine Learning
Programming Languages	Python, C, Java
Softwares & Tools	Pycharm, VS Code, MATLAB
ML and DL Frameworks	PyTorch, TensorFlow (basics)

EXTRA-CURRICULAR

- Secretary of Graduate Student Council at MBZUAI
- Former Assistant Vice President Operation at IET UET Chapter
- Member of Education for Every Child (EFE) foundation
- Enjoy travelling, cricket and table tennis

REFERENCES

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