Personal info

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Objective

I have a mixed experience between conducting pure academic research and contributing to international products in the industry. My research interest is Computer Vision, especially designing accurate, lightweight, and memory-efficient architectures for edge devices. I am seeking a research or software internship related to the field of Computer Vision/AI during my Ph.D. journey.

Education

MBZUAI	**Ph.D. in Computer Vision** - CGPA is 3.95 (A).	**08/2021 – now**
Ain-shams University	**Master degree in Computer Sciences** - Master Courses (2017 / 2018). - CGPA is 3.71 (A-).	**03/2018 – 08/2020**
Ain-shams University	**Bachelor degree in Computer Sciences** - Excellent with honors grade. - Rank: 1st in Scientific Computing department from 149 students.	**09/2012 – 08/2016**

Work experience

Valeo Egypt	**Machine Learning / SW Engineer**	**11/2019 – 7/2021**
Ain-shams University	**Teaching / Lecturer Assistant**	**03/2018 – 7/2021**
Valeo Egypt	**Deep Learning Researcher** Internship at CDV-R&D Excellence team	**01/2019 – 04/2019**
Mercedes Benz-GAS	**Software Engineer**	**09/2016 – 01/2017**
ABB	**Software Engineer** Internship	**08/2016 – 09/2016**

Selected Publications

- *EdgeNeXt: Efficiently Amalgamated CNN-Transformer Architecture for Mobile Vision Applications*, Under review.
- INSTA-YOLO: Real-Time Instance Segmentation based on YOLO published in ICML workshop 2020.
- *Generalization of Convolutional Neural Networks for ECG Classification Using Generative Adversarial Networks* published in IEEE Access Journal, vol. 8, pp. 35592-35605, 2020.

Teaching history

- **Teaching courses:** Machine Learning, Deep Learning, and Computer Vision.
- Mentor in Kaggle competitions for deep learning projects at Ain Shams University.
- Supervisor for several Machine Learning & Computer Vision graduation projects.

Projects

- **Driver Monitoring System (DMS):** The goal of this project is to recognize drivers and monitor driver alertness, such as drowsiness and distraction, and manage the failures of the sensors. I contributed to the SW integration part, receive the components from other platforms (ECP, Vision, and Algorithms teams), and integrate them over integrity OS. Starting from analyzing the customer requirements (SRS), then designing the SW models (using Rhapsody), planning and covering the integration tests, and using Reqtify to trace the coverage between them.
- **Arrhythmia Classification:** In my thesis, I proposed a generalization method using GANs based on different deep learning architectures (CNN, LSTM, deep-CNN, and CNN+LSTM) that improved the overall accuracy and precision of the public MIT-BIH benchmark.
- **Insta-YOLO:** A novel one-stage end-to-end DL model for real-time instance segmentation, the box regression of YOLOv3 is replaced by a polygon regression in the localization head in addition to proposing new localization loss. The model is 1.75x faster than YOLACT with comparable accuracy.
- **Seat Occupancy Detection:** Detect & classify the car seats in order to know how to open the airbag for more safety. I increased the Average Precision (AP) by 4.0% for different versions of YOLO and CenterNet by proposing a different data augmentation method that is based on mixing image normalization techniques.
- **Object Recognition using Radar:** Using TI radar sensors interior of the car, I introduced a prototype of classifying the objects from the heatmaps.
- **Occupancy Grid Mapping:** Autonomous driving requires detailed knowledge about the environment. A common approach to accomplish this task is to use occupancy grid maps (OGM). We built our own OGM based on LIDAR data. I reduced the time from 3.18 MS to 1.28 MS by updating only the polygon of the affected points instead of updating the whole convex hull.

Technical skills

Languages: Python and C++.

Concepts: OOP, Data structures, Analysis and design algorithms, and agile methodologies.

Awards & Honor Certificates

- First place in Ibtiecar competition 2017 (Hold by the Egyptian Ministry of Communications)
  - Ibtiecar is a competition held every year for excellent graduation projects for all engineering and computer sciences colleges in Egypt. We had achieved first place in the Data Science track.
- Coursera certificate for completing the following specializations: -
  - TensorFlow in Practice specialization from deeplearning.ai
  - Deep Learning specialization from deeplearning.ai
  - Machine Learning specialization from the University of Washington
- Ranked in the top 5 among 640 students in the Algorithms and Operating System courses.

Academic Supervisor

- Prof. Dr. Fahad Khan (fahad.khan@mbzuai.ac.ae)

Languages

- Arabic: Native or bilingual proficiency.
- English: Professional working proficiency.