HAMED ESLAMI

Computer Vision Engineer

"Let's empower industrial applications with computer vision ."

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ABOUT ME

I'm a computer vision engineer with **10+** years of experience in software development using **OpenCV**, **PyTorch**, **TensorFlow**, **Keras** and **Dlib** having programming skills in both **Python** and **C++** to develop a variety of computer vision modules from object **detection**, **segmentation** and **recognition** to camera **calibration**, vision based **measurement** and **3D** model estimation.

SKILLS

Computer Vision:
OpenCV, Dlib, TensorFlow, PyTorch, Detectron2, Matrox, Halcon, Cognex

Streaming:
GStreamer, FFmpeg, LibVLC, Live555

Back-End:
Django, Python, C++, LabView, RabbitMQ, GraphQL, Docker

3D & Front-End:
OpnGL, WebGL, Qt, React.js

EDUCATION

Ph.D. in Electrical Engineering

Amirkabir University of Technology
Sep 2010 – Sep 2014

Ranked first in Amirkabir University Entrance Exam

M.Sc. in Electrical Engineering

Amirkabir University of Technology
Sep 2007 – Sep 2010

Introduced as a scientific elite by the National Elite Institute

B.Sc. in Electrical Engineering

Amirkabir University of Technology
Sep 2003 – Sep 2007

Ranked 365 among 500k participants in national entrance exam

EXPERIENCE

Rodia Intelligent Transportation Systems (ITS) — Germany, Berlin

Computer Vision Engineer — Apr. 2023 - Present

Achievements
- Enhancing camera parameter estimation using calibratinn boards using 3 different sizes.
- Developing a semi-automated data annotation to label vehicle's speed and location.
- Reducing the variance of estimated speed errors from **0.65%** to **0.4%**.

Technologies
- Computer Vision Modules: **Camera Calibration**, **Object Detection**, **Tracking**, **3D Model Estimation**
- Frameworks: **YOLO** and **OpenCV** for computer vision, Html, CSS, JavaScript, Canvas, **React.js**, **Three.js**, **react-three-fiber** and **drei** for front-end and **C++, Python, Django** and **Docker** for back-end development and deployment.

SponixTech Sports and Entertainment Industry — Doha, Qatar

Computer Vision Engineer — Mar. 2020 – Apr. 2023 (3 yrs 2 mos)

Achievements
- Re-writing the monolotic application into a **micro-service** based **web-app** making the solution scalable, multi-user and platform independent.
- Making the new application **3 times** faster than its legacy counter-part using **AI** based services for: camera **calibration**, player **detection**, **segmentation**, **3D pose estimation** and etc.
- Integrating photo editing tools in the **web-app** through native **html canvas** which reduced extra editing effort by **50%**

Technologies
- Computer Vision Modules: People **Detection and Segmentation** (Instance/Semantic), **Camera Calibration**, **Facial Recognition**, **3D Pose Estimation**
- Frameworks: **PyTorch, Detectron2**, **OpenCV**, **Dlib** for computer vision, Html, CSS, JavaScript, Canvas, **React.js**, **Three.js**, **react-three-fiber** and **drei** for front-end and **C++, Python, Django, GraphQL, RabbitMQ, Docker** for back-end development and deployment.

Avizhe Group Video Management System (VMS) Industry — Tehran, Iran

Computer Vision Engineer — Sep. 2016 to Feb. 2020 (3 yrs 6 mos)

Achievements
- Developing a license plate recognition engine with an **accuracy of +96%** in different conditions.
- Adding different computer vision based modules to the basic **VMS** software to extend its abilities.
- Decreasing **90% of processing power** in motion detection calculation by using the streamer side data.
- Image distortion removal especially in the **fish-eye** cameras.

LANGUAGES

English Advanced

Persian Native

French Beginner

Arabic Beginner

COURCES

Ph.D.

Machine Vision | Neural Networks | Advanced DSP | Non Linear Filtering | Wavelets | Fuzzy Systems

M.Sc.

Image Processing | DSP | Advanced Computer Network | Pattern Speech Recognition | Virtual Instrumentation | Stochastic Processes | IC Design

TEACHING

Courses

Statistical Pattern Recognition | Signals and Systems | Microprocessor | Microcontroller | Electrical Circuits | Digital Logic Design

Lab Instructor

Digital Logic | Microprocessor | Microcontroller | Electronics | Linear Control | Industrial Electronics

Technologies

- Computer vision modules: **License Plate Recognition, People Counting**, **Facial** Detection, Clustering and Recognition,**Intrusion Detection** and **Video Summarization**
- Frameworks: **OpenCV, DLib** and **TensorFlow** for computer vision, **GStreamer, FFmpeg, Live555, LibVLC** for streaming and **C++, Python, Qt, Boost** for application development.

AIMS Intelligent Transportation Systems (ITS) Industry — Tehran, Iran

Computer Vision Engineer — Mar. 2014 to May. 2016 (2 yrs 7 mos)

- Developing an automated camera calibration for accurate speed measurement and increasing the accuracy of vehicle speed measurement module to +98%.
- Computer vision modules: Vehicle **Detection**, Camera **Calibration**, Speed **Measurement**
- Frameworks and programming languages: **OpenCV, Matrox MIL, Halcon, C++, LabView**.

THESIS

Ph.D.

Precision Improvement In Image Based 3D Model Estimation of Vehicles

In this project, we used a deformable shape model to estimate vehicle's 3D model in consecutive images. We used a novel cost function to minimizes the estimation time while keeping the accuracy in an acceptable range.

M.Sc.

Dynamic parameter extraction of moving vehicles using projective geometry and image processing techniques

In this project, we used parallel lines on the road to calibrate the camera. Then, calculated the vehicle's speed using its license plate as an standard pre-known pattern.

PUBLICATIONS

IET Computer Vision

H. Eslami, A.A. Raie, K. Faez, — April 2016

Precise vehicle speed measurement for law enforcement applications based on calibrated camera with parallel standard patterns

The contribution of this paper is to give a solution to the degeneracy problem of the Zhang's algorithm while dealing with parallel planar patterns and using the calibration data to estimate vehicle's speed.

IEICE Transactions on Information and Systems

H. Eslami, A.A. Raie, K. Faez, — June 2016

Precise vehicle speed measurement based on a hierarchical homographic transform estimation for law enforcement applications

The contribution of this paper is to propose a new precise, practical and fast procedure, with hierarchical architecture, to estimate the homraphic transform of the license plate and using this transform to estimate the vehicle's speed. The proposed method uses the RANSAC algorithm to improve the robustness of the estimation.