M. SINA
ALLAHKARAM

Computer Vision Expert
Full stack Developer
Roboticist

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PROFILE

- As an expert Python programmer with over 7 years of experience in working on various Computer Vision tasks, as well as web and desktop application development, I am now ready to apply my expertise to your projects.

LANGUAGES

Persian Native

English Fluent

EDUCATIONAL BACKGROUND

Master's degree | K. N. Toosi University of Technology
Mechatronics, Engineering   2019-2023
Thesis Title: Development of an image-based deep neural network for human parsing for human behavior classification

Bachelor's degree | K. N. Toosi University of Technology
Electrical and Electronics Engineering   2014-2019
Thesis Title: Hardware implementation of motion estimation function in H.264 video encoder

HARD SKILLS

Skill	Rating
Python	★★★★★
Computer Vision	★★★★★
Deep Learning	★★★★★
Git	★★★★★
Linux	★★★★★
Embedded Sys.	★★★★★
Clean Code	★★★★★
SW Architecture	★★★★★

FRAMEWORKS & LIBRARIES

Detectron2 PyTorch TensorFlow Keras

OpenCV NumPy scikit-learn Flask Django MySQL SQLite SQLAlchemy

Qt HTML5 CSS3 Bootstrap jQuery WordPress Jet engine

SOFT SKILLS

Skill	Rating
Teamwork	★★★★★
Problem Solving	★★★★★
Leadership Skill	★★★★★

NOTABLE PROJECTS

Parsing-Detectron | A Deep Learning Framework For Human Parsing Task

- https://github.com/msinamsina/Parsing-Detectron
- In this project, the Detectron2 framework has been modified. Parsing-Detectron can be used for either detection and segmentation tasks or human parsing tasks.

PyAutoMail | A Python Package For Large Scale Email Automation

- https://github.com/msinamsina/pyautomail
- https://pyautomail.readthedocs.io/en/latest/
- This Python package can be used for easy email automation, and additionally, it has a Command-Line interface for creating email queues and sending personalized emails to your contact lists.

ESEL| Eye Surgery Evaluation and Labelling

- https://drive.google.com/file/d/1oLa4BN6Livk69FaOX7VSaMq09awFhbCD/view
- ESEL is a desktop application that can be used for evaluating Capsulorhexis Eye Surgery based on surgical videos. Furthermore, this application is used for semi-automated labeling in pupil and surgical instrument detection and tracing tasks.

Persian Chair | A Web Application For Evaluating the Articles

- The Persian Chair (PCH) is a Django web application developed in response to a request from the ICRoM Conference.

ARAS Deep Learning Framework| A Deep Learning Framework For object detection
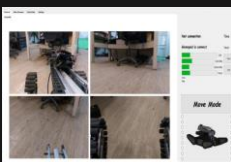
- https://github.com/msinamsina/ARAS-DeepLearning-FW
- In this project, a deep learning framework has been created from scratch for the object detection task, specifically designed for detecting pupils and Capsulorhexis surgery instruments.

Hazmat Detection | Hazardous Materials (HAZMAT) Sign Detection

- In this project, a hazardous materials (HAZMAT) sign dataset was prepared and utilized to train YOLO for creating a hazmat detector.

Rescue Robot Remote Control APP | A GUI For Tele-Operating of UGV Robot

- This is a desktop application that provides a graphical user interface for controlling and interacting with the KN2C Rescue Robot. Additionally, this application includes several sub-applications capable of automatically handling tasks such as hazmat detection, path planning, and inverse kinematics for the 7-DOF robotic arm.

EXPERINCES

Freelancer | Self Employed
- Software Developer
- Computer Vision Expert
- Full-Stack Developer

2023-Now

Computer Vision Researcher | ARAS Laboratory
- Computer Vision Researcher
- Machine Learning Researcher
- Software Developer

2018-2023

Full Stack Developer | IT Team of ICRoM Conference
- Software Developer
- Full-Stack Developer

2018-2023

COO and Software-Hardware designer | Rahbin Sanat Nasir Company
- Chief Operating Officer
- Human Resources Management
- Software-Hardware Designer
- Computer Vision Expert

2022-2023

hardware developer | Ride-On company
- Digital Electronics Engineer
- Embedded Systems Developer

2017-2018

Team Leader, Software-Hardware developer | KN2C Robotic Team
- Human Resources Management
- Digital Electronics Engineer and Embedded Systems Developer
- Software Developer and Desktop Application Designer
- Junior computer vision engineer

2014-2018

ACHIVMENTS AND HONOR

➢ **Top Rank (Second Place) |** In the undergraduate Level (M. Sc)   2023

➢ **IEEE Reviewer |** Review in IEEE Transactions on Medical Robotics and Bionics   2023

➢ **Third place |** RoboCup Asia-pacific Rescue robot league   2018

➢ **Third place |** Iran Open Rescue robot league   2017, 2018

➢ **Second place |** ICRoM Creative Exhibition   2016

➢ **Fifth place |** RoboCup Rescue robot league   2017

PUBLICATIONS

➢ **ARAS-Farabi Experimental Framework for Skill Assessment in Capsulorhexis Surgery**
https://ieeexplore.ieee.org/document/9663494/
This article proposes a new dataset for Capsulorhexis Surgery and introduces a new deep learning framework.

➢ **Surgical Instrument Tracking for Capsulorhexis Eye Surgery Based on Siamese Networks**
https://ieeexplore.ieee.org/document/10025355/
Surgical instrument tracking is a challenging task that can be used for evaluating surgeon performance. This paper presents a new method for tracking surgical instruments during Capsulorhexis Surgery.

➢ **Closed-form Inverse kinematics Equations of a Robotic Finger Mechanism**
https://ieeexplore.ieee.org/document/9663448
Obtaining closed-form inverse kinematics equations for serial arms with arbitrary structures is a challenging task. However, this article proposes closed-form inverse kinematics equations that can be used for a large group of serial robots with fewer than 5 links.

➢ **RoboCup rescue 2017 team description paper KN2C**
https://robocup-rescue.github.io/team_description_papers/2017/Champ2017_Iran_KN2C.pdf
This article introduces a UGV Robot designed with a focus on minimizing reliance on prebuilt parts (both electrical and mechanical) and reducing the total cost, not only for robotic competitions but also with the goal of later global use in rescue missions.

TEACHING EXPERINCES

➢ Computer Vision & Deep Learning Course | ARAS Academy
2022

➢ Robotics for kids | ARAS Academy
2019

➢ Teacher Assistance of Robotics Course | K. N. Toosi university of Technology
2017,2016

➢ Teacher Assistance of Micro-Processors Course | K. N. Toosi university of Technology
2015

➢ Electronic in robotic | KN2C Laboratory
2016

➢ Robotics for kids | Seyidkhandan neighborhood hall
2017