

Ehsan Rahnema

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RESEARCH INTEREST

- Reinforcement Learning
- SLAM Algorithms
- Computer Vision
- Optimization Algorithm
- Localization and Navigation
- Autonomous System
- Intelligent Control Systems
- Robot Perceptions

EDUCATION

University of Tehran

Sep 2015 – Jun 2018

M.Sc. in Mechanical Engineering of Biosystem-Renewable Energy

Tehran, Iran

- **Master Thesis:** Exergetic, Economic, and Environmental Maps for Photovoltaic Systems
- **Supervisor:** Dr. Mortaza Aghbashlo
- **CGPA:** 17.30/20 - 3.81/4

Shahid Chamran University of Ahvaz

Sep 2010 – Sep 2014

B.Sc. in Agriculture Machinery Mechanics

Ahvaz, Iran

- **Final Project:** Design and Manufacture of Laboratory Thresher
- **Supervisor:** Dr. Mohammad Javad Sheikhdavoodi
- **CGPA:** 16.61/20 - 3.56/4

ACADEMIC PROJECTS

Graduate

Artificial Intelligence, Vehicles Based on Renewable Energy

- Develop a **supervised machine learning model** for the purpose of sorting pistachio nut
- Develop a **regression model** for predicting cation exchange capacity of soil
- Apply **KNN and K-means** algorithm to classify iris plants into different species based on their characteristics.
- Employ **PCA** to reduce the dimensionality of the custom data, effectively extracting the most important features.
- Develop **ANN** models by using Matlab
- Lecture on hydrogen fuel cell vehicles for renewable energy-based transportation course

Undergraduate

Engineering Design Methods, Internship, and Project

- Lecture on **ant colony** optimization algorithm
- Implement **ant colony** algorithm by Matlab
- Participate in development of **AVR microcontrollers** to measure moisture of soil
- Design laboratory thresher with SolidWorks

SKILLS

- Proficient in setting up **CUDA** and **cuDNN** toolkits for Nvidia GPU accelerated computing on **Ubuntu**.
- Proficient in **Python** and various ML frameworks like **Tensorflow**, **Pytorch**, Keras
- Experience in working with this **OpenCV** to use image processing algorithms
- Experience in training custom **deep learning** models and deploying to production state
- Experience in working with python framework including **NumPy**, Pandas, **Scikit-learn**, and SciPy
- Utilize **mathematical** and **statistical** knowledge for designing **machine learning** models
- Familiar with **embedded** systems such as **nvidia Jetson board**
- Familiar with **C/C++** programming

PUBLICATION

- **Industrial Scene Change Detection Using Deep Convolutional Neural Networks**
Atghaei, A., **Rahnama, E.**, Azimi, K., Shahbazi, H. (2022)., arXiv preprint arXiv:2212.14278
- **Localizing the Conceptual Difference of Two Scenes Using Deep Learning for Housekeeping Usages**
Atghaei, A., **Rahnama, E.**, Azimi, K. (2022)., arXiv preprint arXiv:2208.04884.
- **A New Systematic Decision Support Framework based on Solar Extended Energy Accounting Performance to Prioritize Photovoltaic Sites**
Aghbashlo, M., Tabatabaei, M., **Rahnama, E.**, Rosen, M. A. (2020)., Journal of Cleaner Production, 256, 120356.
- **Spatio-temporal Solar Exergoeconomic and Exergoenvironmental Maps for Photovoltaic Systems**
Rahnama, E., Aghbashlo, M., Tabatabaei, M., Khanali, M., Rosen, M. A. (2019)., Energy Conversion and Management, 195, 701-711.

PROFESSIONAL EXPERIENCE

ML Engineer

May. 2019 – Present

Veunex

Tehran, Iran

- **Develop a deep learning model for housekeeping usages to localize the conceptual difference**, achieved its goal by employing transfer learning for conceptual feature extraction and self-supervised learning for data augmentation.
- **Explore the field of quantization-aware training in depth.**, advance technique while shrinking the model's size, maintaining accuracy, and being utilized for deploying models on edge systems.
- **Train object detection models capable of handling fluctuating conditions**, Trained models to detect person and personal protective equipment (PPE) that is reliable under varying conditions, such as an industrial setting.
- **Deploy models on embedded systems such as Jetson board**, optimize the chosen model for inference on the Jetson Xavier NX and convert models to other frameworks, especially TensorRT
- **Develop proficiency in deploying models on NVIDIA Triton servers**, open-source inference serving software that simplifies the deployment of AI models at scale in production environments, and supports various deep learning frameworks such as TensorFlow, PyTorch, and ONNX.
- **Implement MLflow for managing ML workflow and establishing a model registry**, deploy this software by docker, register model, compare two or more than two experiments to tune model
- **Develop and deployed classification models using various algorithms**, use from traditional machine learning techniques such as KNN and SVM to deep learning approaches including CNN and ViT and implement by scikit-learn, pytorch or keras framework
- **Demonstrate ability to utilize python frameworks for visualization of distributed training data**, using pandas, plotly and matplotlib frameworks

LANGUAGE & SOFTWARE

- **Persian:** Native
- **English:** I have scheduled the **TOEFL** exam for November
- **Tools:** LaTeX, Notion, Jira, GitHub, Vim, PostgreSQL, OBS, Microsoft Office

HONORS & CERTIFICATE

- **Generative AI with Large Language Models**, DeepLearning.AI
- **Ranked as the Top 10 % of Class of 2015**, Mechanical Engineering of Biosystems Department, University of Tehran
- **Ranked 4th out of 30 Students of Class of 2010**, Department of Biosystem Engineering, Shahid Chamran University of Ahvaz
- **Waived Tuition (B.Sc.)**

SELECTED COURSES

Graduate

- Artificial Intelligence - 17.25/20
- Intermediate Engineering Mathematics - 15.5/20
- Vehicles Based on Renewable Energy - 20/20
- Research Methods - 16.39/20
- Life Cycle Assessment - 18.5/20
- Advanced Heat Transfer - 17.5/20

Undergraduate

- Statics – 18.5/20
- Dynamics - 16.75/20
- Engineering Design Methods - 17/20
- Engineering Statistics - 17.25/20
- Thermodynamics - 18/20
- Fluid Mechanics – 18/20

REFERENCES

Mohammad Javad Sheikhdavoodi

Emeritus Professor, Biosystems Department, Shahid Chamran University of Ahvaz

E-mail

Mortaza Aghbashlo

Associate Professor, Mechanical Engineering of Biosystems Department, University of Tehran

E-mail

Majid Khanali

Associate Professor, Mechanical Engineering of Biosystems Department, University of Tehran

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Mohamad Esmail Khorasani Ferdavani

Assistant Professor, Biosystems Department, Shahid Chamran University of Ahvaz

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Omid Reza Roustapour

Assistant Professor, Agricultural Research, Education and Extension Organization

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