

# Ehsan Rahnema

+989013842626 | ehsan.rahnema25@gmail.com | Skype | Google Scholar | Github | LinkedIn  
Tehran, Iran

## 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

## PUBLICATION

- **Industrial Scene Change Detection Using Deep Convolutional Neural Networks**  
Atghaei, A., **Rahnema, 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., **Rahnema, 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., **Rahnema, E.**, Rosen, M. A. (2020)., Journal of Cleaner Production, 256, 120356.
- **Spatio-temporal Solar Exergoeconomic and Exergoenvironmental Maps for Photovoltaic Systems**  
**Rahnema, E.**, Aghbashlo, M., Tabatabaei, M., Khanali, M., Rosen, M. A. (2019)., Energy Conversion and Management, 195, 701-711.

## 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.)**

## ACADEMIC PROJECTS

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### Graduate

- Developed a **supervised machine learning model** for the purpose of sorting pistachio nut
- Developed a **regression model** for predicting cation exchange capacity of soil
- Applied **KNN and K-means** algorithm to classify iris plants into different species based on their characteristics.
- Employed **PCA** to reduce the dimensionality of the iris data, effectively extracting the most important features.
- Lecture on hydrogen fuel cell vehicles for renewable energy-based transportation course
- Survey the feasibility of biogas production in the College of Agriculture and Natural Resources.

### Undergraduate

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

## PROFESSIONAL EXPERIENCE

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### ML Engineer

May. 2019 – Present

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Tehran, Iran

- **Localized the Conceptual Difference of Two Scenes Using Deep Learning for Housekeeping Usages**, achieved its goal by employing transfer learning for conceptual feature extraction and self-supervised learning for data augmentation.
- **Explored 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.
- **Trained 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.
- **Deployed 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
- **Developed 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.
- **Implemented 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
- **Developed 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
- **Demonstrated ability to utilize Python frameworks for visualization of distributed training data**, using pandas, plotly and matplotlib frameworks

## SKILLS

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Proficient in setting up **CUDA** and **cuDNN** toolkits for Nvidia GPU accelerated computing on **Ubuntu**.

**Programming** : Python, C/C++, MATLAB, HTML/CSS, T-SQL (PostgreSQL, MySQL)

**Framework** : Tensorflow, PyTorch, Keras, Scikit-Learn, OpenCV, Numpy, Pandas

**Tools** : LaTeX, Notion, Jira, GitHub, OBS

### Language

- Persian: Native
- English: I will take TOEFL soon

## SELECTED COURSES

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### 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

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### **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*

E-mail

### **Mohamad Esmail Khorasani Ferdavani**

*Assistant Professor, Biosystems Department, Shahid Chamran University of Ahvaz*

E-mail

### **Omid Reza Roustapour**

*Assistant Professor, Agricultural Research, Education and Extension Organization*

E-mail

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