

# KIMIA AFSHARI

**Phone:** +1 (747)-281-7532

**Email:** kajalafshari@yahoo.com

**Website:** kimiaafshari.com

**LinkedIn:** [Linkedin.com/in/kimia-afshari](https://www.linkedin.com/in/kimia-afshari)

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## RESEARCH INTERESTS

- Artificial Intelligence and Machine Learning
- Robotics and Human-Robot Interaction
- Computer Vision and Image Processing
- Autonomous Vehicles and Navigation

## EDUCATION

**B.Sc. in Computer Engineering (GPA: 3.64/4.0)** Sep 2016 – Sep 2020

**K. N. Toosi University of Technology (KNTU) - Tehran, Iran**

*Thesis Title: Design and implementation of 2D and 3D medical images display and processing software with user interface and IPython console*

*Supervisors: Prof. Hamid Abrishami Moghaddam, Prof. Behrooz Nasihatkon*

**Pre-University in Mathematical Science (GPA: 4.0/4.0)** Sep 2015 – Jun 2016

**Reyhaneh Alrasoul High school - Tehran, Iran**

## SELECTED COURSES

- Fundamentals of Computer Vision
- Principles of Robotics
- AI and Expert Systems
- Algorithms Design
- Computer Architecture Lab.
- Computer-Aided Design Lab.

## RESEARCH EXPERIENCES

**AI Researcher and Developer** Jul 2019 – Sep 2020

**MVMIP Laboratory - K. N. Toosi University of Technology**

*Design and development of MedVisPy, a medical desktop software developed under Python, aims to help clinics and hospitals analyze and process CT images, including lung and brain images. The software is equipped with an IPython console and provides some outstanding features, such as adding custom plugins to embed the various developed modules as internal plugins and batch processing to make data processing faster and more straightforward.*

*Supervisor: Prof. Hamid Abrishami Moghaddam*

**Machine Vision Researcher** Jul 2018 – Jun 2019

**KN2C Robotic Team - K. N. Toosi University of Technology**

*Development of a real-time algorithm to detect landing boards and yellow and red gates, in addition to robot routing using C++ and OpenCV library. A robot's mission is to cross the yellow gates from above and pass through the red gates robustly without any collisions to score corresponding points.*

*Supervisor: Prof. Hamid Taghirad*

## TEACHING EXPERIENCES

<b>Teaching Assistant of Internet Engineering</b> K. N. Toosi University of Technology <i>Mr. Mehdi Zamanian</i>	<i>Feb 2020 – Jul 2020</i>
<b>Teaching Assistant of Database</b> K. N. Toosi University of Technology <i>Prof. Saeed Farzi</i>	<i>Feb 2019 – Jul 2019</i>
<b>Teaching Assistant of Advanced Programming (Java)</b> K. N. Toosi University of Technology <i>Prof. Mehdi Esnaashari</i>	<i>Sep 2017 – Jan 2019</i>
<b>Teaching Assistant of Fundamentals of Computer and Programming</b> K. N. Toosi University of Technology <i>Prof. Amin Nikanjam, Prof. Behrooz Nasihatkon</i>	<i>Feb 2017 – Jul 2017</i>

## PROJECTS

<b>MedVisPy - Academic</b> <i>An innovative 2D and 3D medical images processing software developed under Python to display and analyze CT images, including lung and brain images. This software is fully documented and aims to run all the laboratory achievements in a unified platform, and is also capable of batch processing to make data processing easier and accelerated.</i> <i>Libraries: TensorFlow, NumPy, Panda, PyQt, VTK, ITK, Matplotlib, IPython</i>	<i>Jul 2019 – Sep 2020</i>
<b>Facial Expression Recognition - Academic</b> <i>A Python program to detect the seven types of emotions in the human face (happiness, sadness, anger, neutral, surprise, fear, and disgust) in real-time using Cascade Classifier and Convolutional Neural Network (CNN) implemented by Keras and OpenCV libraries</i>	<i>Mar 2019 – Jul 2019</i>
<b>Real-time Gate Detection - Academic</b> <i>A program to detect yellow and red u-shaped gates in real-time using C++ and OpenCV library by which a drone robot is assigned to cross the yellow gates from above and pass through the red gates without any collisions to the gates to score corresponding points. This robust algorithm emits the signals related to the detected gates for robot routing.</i>	<i>Jul 2018 – Jun 2019</i>
<b>Real-time Robot Line Following - Academic</b> <i>A program to detect and track lines in real-time with Hough Transform using C++ and OpenCV library. A drone robot is assigned to follow the line with given points and directions and choose the right path in intersections with existing QR codes.</i>	<i>Apr 2018 – Jun 2018</i>
<b>Maximum Matching using Hopcroft-Karp algorithm - Academic</b> <i>Java graphical implementation of Maximum Matching in bipartite graphs using Hopcroft-Karp algorithm</i>	<i>Mar 2019 – Apr 2019</i>
<b>Regular Expression using NFA - Academic</b> <i>A graphical program developed under Java to detect and extract all the words which are valid in the given Regex and acceptable by the NFA</i>	<i>Jan 2019 – Feb 2019</i>
<b>Bubble Shooter Game - Academic</b> <i>A desktop game about shooting colorful bubbles toward a moving sequence of bubbles in a limited time developed under C++</i>	<i>Dec 2016 – Feb 2017</i>
<b>Sabz Energy Caspian - Professional</b> <i>Designing the official website of the company using WordPress</i>	<i>Aug 2020 – Oct 2020</i>
<b>GustoLand - Professional</b> <i>Official restaurant presentation and reservation website</i> <i>Languages and Libraries: Html, CSS, JS, PHP, jQuery and Laravel frameworks</i>	<i>May 2019 – Sep 2019</i>

## AWARDS AND HONORS

- **1<sup>st</sup> Place** at the 6<sup>th</sup> exhibition of Scientific-Applied top theses by the decision of the **Professors** in K. N. Toosi University of Technology for **MedVisPy** in Oct 2020
- **1<sup>st</sup> Place** of indoor emergency service drone league at Iran FIRA RoboWorldCup Open in Sep 2019
- Ranked among the **top 20** Bachelor's theses of Electrical and Computer Engineering faculties in K. N. Toosi University of Technology in Sep 2020
- Participation in the **Machine Vision challenge** at the ICT innovation center held by Sharif University of Technology in Sep 2018
- Participation in the **Java Cup coding challenge** held by Shahid Beheshti University in Feb 2018
- Receiving a **full scholarship** from K. N. Toosi University of Technology (*Tuition waiver*)
- Ranked within the **top 1%** among **162,731** participants in Iran's national university entrance examination (*Konkur*) in Aug 2016

## CERTIFICATES

<b>Machine Learning Foundations: A Case Study Approach</b> <i>Certified by Coursera</i>	<i>May 2021</i>
<b>Deep Learning Fundamentals Course</b> <i>Certified by ACM Student Chapter - K. N. Toosi University of Technology</i>	<i>Jul 2019</i>
<b>Image Processing in Robotics Course</b> <i>Certified by KN2C Robotic Team - K. N. Toosi University of Technology</i>	<i>Jun 2017</i>

## SKILLS

### Programming Languages

*Python {TensorFlow, Keras, NumPy, Panda, PyQt, OpenCV, VTK, ITK/SITK, Matplotlib}, C/C++, Assembly, Java, HTML, CSS, JavaScript (jQuery), MYSQL, PHP (Laravel)*

### Development Environments

*PyCharm, IntelliJ Idea, PhpStorm, VS Code, NetBeans, Android Studio*

### Technical Knowledge

*Machine Learning, Machine Vision, Image Processing, Web Design, Android Development*

### Software

*MRicro, ITK-Snap, Version Control System (Git), Microsoft Office, Adobe Photoshop*

### Operating Systems

*Linux (Raspbian/Ubuntu), Windows*

### Personal

*Teamwork, Teaching Assistance, Communication, Presentation*

## REFERENCES

**Prof. Hamid Abrishami Moghaddam**  
**Professor of AI and Biomedical Engineering**  
Email: moghaddam@kntu.ac.ir

**Prof. Hamid Taghirad**  
**Professor of Electrical Engineering**  
Email: taghirad@kntu.ac.ir