# Hadi Ghahremannezhad

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## EDUCATION

**New Jersey Institute of Technology** — New Jersey, USA
Ph.D. in Computer Science (GPA: 3.89/4.0) — Expected Dec 2022
Relevant Coursework: Data Mining, Machine Learning, Data Structures & Algorithm Design, Pattern Recognition

**Shahid Beheshti University** — Tehran, Iran
MSc. in Software Engineering (GPA: 3.44/4.0) — Sep 2014 – Sep 2017
Relevant Coursework: Neural Networks, Image Processing, Artificial Intelligence

**K.N. Toosi University of Technology** — Tehran, Iran
BSc. in Software Engineering — Sep 2009 – Sep 2014
Relevant Coursework: Advanced Programming, Probability & Statistics, Linear Algebra, Multimedia Systems

**CodePath** — Online Education
Certificate in Advanced Software Engineering — May 2022 - Aug 2022

## SKILLS

**Recent Experience**: Python, C++, LaTeX
**Others:** JAVA, JavaScript, SQL, MATLAB
**Frameworks:** PyTorch, OpenCV, NumPy, TensorFlow, Keras

## PROFESSIONAL EXPERIENCE

**Innovative AI Technologies** (iAItech) — New Jersey, USA
Research Intern — June 2022 – Aug 2022

- Developed a video analytics system using deep learning models for detection of dilemma zone conflicts at signal-controlled intersections using edge computing and 5G.
- Designed a smart Unmanned Aircraft System (UAS) based on deep learning models for missing person search and rescue in heavily dense forested areas.

## SELECTED PROJECTS

**Traffic Video Analytic** — Sep 2018 – May 2022

- Developed a system for traffic video analytics using statistical and deep learning models. This project was funded by NJDOT. It involves several tasks, including automatic foreground detection, road segmentation, accident detection, object classification, and cast shadow removal in traffic videos. (link)

**Ammunition Component Classification** — Oct 2021 - Dec 2021

- Deployed a three-tier architecture for Ammunition Component Classification using deep learning and a statistical framework. Our system captures the energetic threats in munition scraps using visual images and x-ray images. (link)

**Object Detection and Classification in Aerial Imagery** — July 2021 – Oct 2021

- Designed an object detection and classification system for multi-class vehicle detection in remote sensing and aerial images based on deep learning models. (link)

**Brain Tumor Segmentation** — Jan 2018 - May 2018

- Implemented a deep learning model based on UNet to segment brain tumors in MRI images in BRATS dataset. (link)

## PUBLICATIONS

- "Real-Time Accident Detection in Traffic Surveillance Using Deep Learning", IEEE International Conference on Imaging Systems and Techniques, 2022 (link)
- "Unsupervised Anomaly Detection in Traffic Surveillance Based on Global Foreground Modeling", IEEE International Conference on Imaging Systems and Techniques, 2022 (link)
- "Illumination-Aware Image Segmentation for Real-Time Moving Cast Shadow Suppression", IEEE International Conference on Imaging Systems and Techniques, 2022 (link)
- "Real-Time Hysteresis Foreground Detection in Video Captured by Moving Cameras", IEEE International Conference on Imaging Systems and Techniques, 2022 (link)
- "A New Online Approach for Moving Cast Shadow Suppression in Traffic Videos", IEEE International Conference on Intelligent Transportation Systems, 2021 (link)
- "Anomalous Driving Detection for Traffic Surveillance Video Analysis", IEEE International Conference on Imaging Systems and Techniques, 2021 (link)
- "Robust Road Region Extraction in Video Under Various Illumination and Weather Conditions", IEEE International Conference on Image Processing, Applications and Systems, 2020 (link)
- "A Statistical Modeling Method for Road Recognition in Traffic Video Analytics", IEEE International Conference on Cognitive Info communications, 2020 (link)
- "Automatic Road Detection in Traffic Videos", IEEE International Conference on Big Data and Cloud Computing, 2020 (link)
- "A Real Time Accident Detection Framework for Traffic Video Analysis", 16th International Conference on Machine Learning and Data Mining, 2020 (link)
- "A New Adaptive Bidirectional Region-of-Interest Detection Method for Intelligent Traffic Video Analysis", IEEE International Conference on Artificial Intelligence and Knowledge Engineering, 2020 (link)
- "Vehicle Classification in Video Using Deep Learning", International Conference on Machine Learning and Data Mining, 2019 (link)

## SELECTED RESEARCH EXPERIENCE

**New Jersey Institute of Technology** — New Jersey, USA
Research Assistant - Advisor: Prof. Chengjun Liu — Sep 2018 – May 2022

- Assembled a system for statistical traffic video analytics using including several projects for automatic foreground detection, road segmentation, accident detection, and cast shadow removal in surveillance videos.
- Built a CNN-based object detection method for vehicle classification.

**Shahid Beheshti University** — Tehran, Iran
Research Assistant - Advisor: Prof. Ali Zakerolhosseini — Sep 2015 – July 2017

- Engineered a vehicle detection system using TensorFlow.

**K.N. Toosi University of Technology** — Tehran, Iran
Research Assistant - Advisor: Prof. Davud Asemani — Nov 2013 – Sep 2014

- Designed a 3D Graphical Mobile Application system using OpenGL in Java.

## SELECTED TEACHING EXPERIENCE

**New Jersey Institute of Technology** — New Jersey, USA
Teaching Assistant — Sep 2018 – Sep 2022

- Artificial Intelligence (Python) – Mentor: Prof. Pantelis Monogioudis
- Data Structures and Algorithms (Java) – Mentor: Prof. James Calvin
- Concepts of Programming Languages (C++) – Mentor: Dr. Bassel Arafeh

## AWARDS

- 2022 - U.S. DOT SBIR Phase I Award (link)
- 2021 - NIST's First Responder UAS Triple Challenge Prize (link)
- 2019 - Ying Wu '88 Endowed Fellowship (NJIT)
- 2018 - Graduate Stipend Award, Graduate Tuition Award (NJIT)