Hadi Ghahremannezhad

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Education

- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  PhD. candidate - Computer Science; GPA: 3.89 — *Sep 2018 - Present*
  Thesis: *Advanced Traffic Video Analytics for Robust Traffic Accident Detection*

- **Shahid Beheshti University (SBU)** — Tehran, Iran
  MSc. - Software Engineering; GPA: 3.44 — *Sep 2014 - Sep 2017*
  Thesis: *Improving the Performance of Vehicle Detection in Aerial Images Using Deep Neural Networks*

- **K.N. Toosi University of Technology (KNTU)** — Tehran, Iran
  BSc. - Software Engineering — *Sep 2009 - Sep 2014*
  Thesis: *Application Design and Implementation for 3D Image Processing in Mobile Phones*

- **Relevant Courses:**
  Data Mining, Machine Learning, Data Structures & Algorithm Design, Pattern Recognition, Artificial Intelligence, Advanced Programming, Probability & Statistics, Neural Networks, Image Processing, Linear Algebra, Multimedia Systems, Geometry Processing

Skills Summary

- **Recent Experience**: C++, Python, 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 Research Experience

- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  Research Assistant (Advisor: Prof. Chengjun Liu) — *Sep 2018 - Present*
  - Developed 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
  - Developed a CNN-based object detection methods for vehicle classification.
- **Shahid Beheshti University (SBU)** — Tehran, Iran
  Research Assistant (Advisor: Prof. Ali Zakerolhosseini) — *Sep 2014 - Sep 2017*
  - Engineered a vehicle detection system using Tensorflow.
- **K.N. Toosi University of Technology (KNTU)** — Tehran, Iran
  Research Assistant (Advisor: Prof. Davud Asemani) — *Sep 2009 - Sep 2014*
  - Designed a 3D Graphical Mobile Application system using OpenGL.

Selected Projects

- **Traffic Video Analytic** (link)
  - Funded by NJDOT - Developed a system for traffic video analytics using statistical and deep learning models. It involves several tasks, including automatic foreground detection, road segmentation, accident detection, object classification, and cast shadow removal in traffic videos.
- **Ammunition Component Classification** (link)
  - Designed 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.
- **Brain Tumor Segmentation** (link)
  - Implemented a deep learning model to segment brain tumors in MRI images (BRATS dataset) based on UNet.
- **Object Detection and Classification in Aerial Imagery** (link)
  - Designed an object detection and classification system for multi-class vehicle detection in remote sensing and aerial images based on deep learning models.

Publications

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

Selected Teaching Experience

- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  Teaching Assistant for CS 370 (Mentor: Prof. Pantelis Monogioudis) — *Jan 2022 - Aug 2022*
  - **Artificial Intelligence**: Covered topics including Convolutional Neural Networks, Scene Understanding, Reinforcement Learning, Natural Language Processing.
- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  Teaching Assistant for CS 114 (Mentor: Prof. James Calvin) — *Sep 2021 - Dec 2021*
  - **Data Structures and Algorithms**: Efficient algorithm implementations in Java.
- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  Teaching Assistant for CS 280 (Mentor: Dr. Bassel Arafeh) — *Sep 2020 - Dec 2021*
  - **Concepts of Programming Languages**: Conceptual study of programming language syntax, semantics and implementation in C++.
- **New Jersey Institute of Technology (NJIT)** — New Jersey, USA
  Teaching Assistant for CS 670 (Mentor: Prof. Chengjun Liu) — *Sep 2018 - May 2019*
  - **Artificial Intelligence**: Covered topics including Intelligent Agents, First-Order Logic, Statistical Learning Theory, Decision Tree, Neural Networks, Deep Learning, Reinforcement Learning, Genetic Algorithms, and Robotics.

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)