

Amir Hossein Farzaneh

Computer Vision and Machine Learning Researcher

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Research Interests

- Computer Vision
- Machine Learning
- Deep Learning

Skills

Programming | Python, C/C++/C#, MATLAB, JAVA, LaTeX
Deep Learning Frameworks | PyTorch, TensorFlow, Microsoft CNTK
OS | Linux Ubuntu, Windows, Mac OSX
Also Worked With | Fast/Faster RCNN, YOLO(You Only Look Once), git, Jupyter

Work Experience

Utah State University | RESEARCH ASSISTANT

Logan, Utah, US | Fall 2015 - Present

- Designed a regularized Multiple Instance Learning Loss function for Convolutional Neural Networks (VGG, ResNet, etc.) to address highly correlated instances when classifying a large image database. The framework is implemented in PyTorch.
- Built a Deep Learning algorithm to predict children's emotions using their facial expressions. The algorithm is implemented using TensorFlow to learn and predict emotions.
- Developed a robust and reliable algorithm to register RGB and near-infrared (NIR) cross-spectral images. The proposed method outperforms other state-of-the-art methods to date by 14% in terms of RMSE error. The algorithm is implemented in MATLAB with applications in medical image analysis and multi-modal image fusion.
- Developed an algorithm in MATLAB to generate a NIR mosaic map of aerial still images in parallel to generating the RGB mosaic map. The proposed method uses cross-spectral image registration to double the speed of mosaic map generation.

Academic Experience

Utah State University | Logan, Utah, US

Computer Vision: Foundations and Applications (CS5680/CS6680) | TEACHING ASSISTANT / GUEST LECTURER, supervised by Dr. Xiaojun Qi.

Lecturing on how to do Computer Vision and Deep Learning research. Tutorial on Machine Learning fundamentals. *Fall 2018*

Python Programming (CS1400) | LAB INSTRUCTOR, supervised by Dr. Douglas Galarus and Dr. Chad Mano, designed tutorial python programming notebooks using Jupyter. *Spring and Summer 2018*

Advanced CVPRIP: Computer Vision, Pattern Recognition and Image Processing (CS7680) | GUEST LECTURER, supervised by Dr. Xiaojun Qi, tutorial on Deep Learning fundamentals and Regional Convolutional Neural Networks for object detection. *Spring 2017*

Instrumentation for Biological Systems (BENG3000) | GUEST LECTURER, tutorial on programming fundamentals with MATLAB. *Spring 2017*

Computer Vision: Foundations and Applications (CS5680/CS6680) | TEACHING ASSISTANT, supervised by Dr. Xiaojun Qi. *Fall 2016*

Introduction to Computer Science (CS1400) | TEACHING ASSISTANT, supervised by Dr. Dan Watson. *Fall 2015*

Shahrood University of Technology | Iran

Systems and Signal Processing (ENG) | TEACHING ASSISTANT, supervised by Dr. Alireza Ahmadyard *Spring 2015*

Fundamental of Computer Programming: C++ (ENG) | TEACHING ASSISTANT, supervised by Dr. Hossein Khosravi. *Spring 2015*

Publications

Conference Papers

A. H. Farzaneh, X. Qi, **Optimized Feature-Based Image registration for RGB and NIR pairs**, IEEE International Conference on Multimedia and Expo (ICME2018), *San Diego, CA, US*.

Y. M. Behbahani, P. Ghayour, A. H. Farzaneh, **Eigenvalue Steganography Based on Eigen Characteristics of Quantized DCT Matrices**, IEEE International Conference on Information Technology & Multimedia (ICIMU2011), *Kuala Lumpur, Malaysia*.

Posters

A. H. Farzaneh, X. Qi, **Recognizing Children's Emotions Using Convolutional Neural Networks**, Student Research Symposium (SRS2018), *Logan, UT, US*.

Education

Ph.D. in Computer Science | Utah State University

Utah, USA | 2015 - 2020

- Research Area: Computer Vision, Deep Learning
- Adviser: Professor Xiaojun Qi
- GPA: 3.94

M.Sc. in Electrical Engineering | Shahrood University of Technology

Shahrood, Iran | 2013- 2015

- Research Area: Computer Vision, Image Processing
- Thesis: An Optimized Superpixel Algorithm in the Framework of Egocentric Vision
- GPA: 18.26 out of 20

B.Sc. in Electrical Engineering | Shahid Beheshti University

Tehran, Iran | 2008 - 2012

- Research Area: Computer Vision, Image Processing
- Thesis: Driving a Remote-Controlled Vehicle Using Kinect
- GPA: 15.09 out of 20

Honors & Awards

Student Research Symposium (**SRS2018**), best graduate poster in the College of Engineering, 2018.

Travel scholarship for attending and presenting at Center for Innovative Research in Cyber-Learning (**CIRCL**) Workshop on Robots, Young Children and Alternative Input, *Northern Illinois University, January 25-26 2018*

Graduate Research and Creative Opportunities **GRCO** grant, *Utah State University, Fall 2017*

Computer Science Department Fall Research Assistant Scholarship Award, *Utah State University, 2017*

Computer Science Department Spring Research Assistant Scholarship Award, *Utah State University, 2017*

1-Year Utah Water Lab Research Laboratory Research Assistant Scholarship Award, *Fall 2015 to Summer 2016*

Ranked 3rd among the students of Electrical Engineering program at the School of Electrical and Robotic Engineering, Shahrood University of Technology, *Iran*

Selected Academic Projects

- Open source implementation of *L-Softmax: Large-Margin Softmax Loss for Convolutional Neural Networks* in **PyTorch** | **Computer Vision, Deep Learning**.
- Analyzing and implementing classic Machine Learning algorithms (e.g., GBM, Logistic Regression, SVM, Random Forests, and etc.) on EEG Eye State Detection implemented in **R** | **Data Analysis, Machine Learning**.
- Implementing Faster-RCNN Object Detection Algorithm for a small Traffic Sign dataset in **MATLAB** | **Computer Vision, Deep Learning**.
- Vector-based drawing GUI program in **Visual C#** | **Computer Graphics, Computational Geometry**.
- Feature Regression for Image Registration in **MATLAB** | **Image Processing, Machine Learning**.
- Detecting Epilepsy using EEG signals and Wavelets in **C++ and MATLAB** | **Data Analysis**.

Extracurricular Activities

Certificates

Convolutional Neural Networks by **deeplearning.ai on Coursera**. Certificate earned on August 2018.

Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization by **deeplearning.ai on Coursera**. Certificate earned on December 2017.

Neural Networks and Deep Learning by **deeplearning.ai on Coursera**. Certificate earned on September 2017.

Paper Reviews

Reviewer of **IEEE International Conference on Multimedia and Expo (ICME)**, Supervised by Xiaojun Qi, February 2018.

Reviewer of **IEEE/CAA Journal of Automatica Sinica**, Supervised by Xiaojun Qi, October 2017.

Leadership

President of Iranian Students and Scholars Association (**ISSA**), Utah State University, 2017-present