

Maral Mesmakhosroshahi

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Education

Illinois Institute of Technology

Ph.D., Electrical Engineering

Thesis title: Real-time Stereo based Pedestrian Detection

Chicago, IL

2012–present

Illinois Institute of Technology

M.Sc., Electrical Engineering

Thesis title: Action Recognition Using Spatio-temporal Feature Extraction

Chicago, IL

2010–2012

Sharif University of Technology

B.Sc., Electrical Engineering

Thesis title: Design and Simulation of Quasi Resonant Converters

Tehran, Iran

2005–2010

Courses

Statistical Pattern Recognition, Statistical Signal Processing, Computer Vision and Image Processing, Video Communication, Digital Signal Processing I & II, Analysis of Random Signals, Applied Statistics, Applied Optimization

Experience

Multimedia Communication Lab, IIT

Graduate Research Assistant

Chicago, IL

2011–present

- Leader of the pedestrian detection sub-group;
- Research on real-time stereo-based pedestrian detection;
- Design of a fast stereo-based pedestrian detector;
- Software development and integration for Stereo-based pedestrian detection in advanced driver assistance systems (ADAS) using C++/OpenCV and OpenCL;
- Research on spatio-temporal feature extraction for action recognition
- Mentor of several undergraduate and graduate students

Research Interests

- Computer Vision
- Pattern Recognition
- Machine Learning
- Object Detection
- Object Tracking

Computer Skills

Languages: C, C++, Matlab

Operating Systems: Windows, Linux

Programming Environments: gedit with gcc and g++, Visual Studio on Windows

Libraries: OpenCV

Typesetting: LaTeX, MS Word

Publications

1. M. Mesmakhosroshahi and J. Kim, "ROI Reduction for Fast Pedestrian Detection," submitted to *the Visual Communications and Image Processing (VCIP)*, 2015.
2. M. Zarshenas, M. Mesmakhosroshahi and J. Kim, "Fast Depth Estimation using Spatio-temporal Prediction for Stereo-based Pedestrian Detection," submitted to *the Visual Communications and Image Processing (VCIP)*, 2015.
3. M. Mesmakhosroshahi and J. Kim, "Stereo based ROI Generation and Tracking for Pedestrian Detection," submitted to *the Image and Vision Computing*, 2015.
4. M. Mesmakhosroshahi, K-H. Chung, Y. Lee and J. Kim, "Depth Gradient Based Region of Interest Generation for Pedestrian Detection," In *the 2014 International SoC Design Conference (ISOCC)*.
5. J. Kim and M. Mesmakhosroshahi, "Stereo-based Region of Interest Generation for Real-time Pedestrian Detection," In *Peer-to-Peer Networking and Applications*, pp. 1–8, 2013.
6. M. Mesmakhosroshahi, J. Kim, Y. Lee and J-B. Kim, "Stereo based Region of Interest Generation for Pedestrian Detection in Driver Assistance Systems," In *Proceedings of the International Conference on Image Processing (ICIP)*, pp. 3386–3389, 2013.
7. M. Mesmakhosroshahi and J. Kim, "Improving Spatio-temporal Feature Extraction Techniques and Their Applications in Action Classification," In *Proceedings of the Visual Communications and Image Processing (VCIP)*, pp. 1–6, 2012.

Patents

- o M. Mesmakhosroshahi, M. Loghman, J. Kim, "System for Detecting Objects by Fusing Color and Depth Information", Filed July 2014, Patent Pending.
- o M. Loghman, M. Mesmakhosroshahi, J. Kim, "Multi-resolution Depth Estimation Using Modified Census Transform For Advanced Driver Assistance Systmes", Filed August 2014, Patent Pending.

Presentation

- o "Improving Spatio-temporal Feature Extraction Techniques and Their Applications in Action Classification." *Visual Communications and Image Processing (VCIP)*, 2012

Honors and Awards

Full Research Assistantship: ECE Department, IIT, 2011-present.

Ranked 56th: in the National University Entrance Exam among 400,000+ participants, Iran, 2005.

Main Projects

- Designed a stereo based pedestrian detection framework using color and depth frames.
- Proposed and implemented an ROI generation method for pedestrian detection using variable sized bounding boxes.
- Proposed and implemented a flat region extraction method for reducing the computational complexity of pedestrian detection.
- Proposed and implemented a fast HOG feature extraction method using GPU-HOG.
- Proposed and implemented a candidate generation method by extracting morphological skeleton.
- Proposed and implemented a spatio-temporal interest point detection and feature extraction method for human action recognition.
- Implemented deep convolutional neural network and convolutional sparse coding algorithm in Matlab and C++.
- Implemented different interest point detection and feature extraction techniques in Matlab and C++.
- Implemented different image segmentation techniques in Matlab.

Professional Activities

- Reviewer for the IEEE Transactions on Intelligent Transportation Systems.

Memberships

- IEEE Signal Processing Society
- IEEE Computer Society
- IEEE Women in Engineering