Ehsan Emad Marvasti

Contact Information

Department of Computer Science
University of Central Florida
Orlando, Florida

Mobile: 4072278023
e_emad@knights.ucf.edu

Education

- **PhD and M.S. in Computer Science** Department of Computer Science, University of Central Florida, Orlando, Florida. Aug 2014 - present
  - **Emphasis**: Machine Learning, Convolutional Neural Networks, Vehicular Communication Networks and Channel Models, Image Classification, Information Theory and Bayesian Inference.
- **B.S. in Computer Engineering**, Department of Computer Engineering, **Sharif University of Technology**, Tehran, Iran. Sep 2008 - Jun 2014
  - Thesis: An Improvement of SIR Method with Constrained State Transition Functions for Tracking Pedestrians

Skills

- Programming and tools: Proficient in Java, Python, Matlab, C/C++.
- Libraries and APIs: Keras, Tensorflow, Theano, ANJI

Awards and Honors

- Ranked **196th** (400,000+ participants) in nationwide universities entrance exam Tehran, Iran. Jun 2008
- Alumni of **National Organization for Development of Exceptional Talents** Shiraz, Iran. Jun 2008

Research Experience

- **Graduate Research Assistant at Networked Systems Lab**
  University of Central Florida Aug 2017 - present
  - **Vehicle to Vehicle Communication Research - Analysis and Modeling**
    Performing analysis on V2V communication performance and estimating a model to reconstruct signal propagation process. Due to partially observed samples caused by receiver packet drop threshold, a method was proposed to estimate the distribution from samples generated by a truncated distribution.
    Joint work with Yaser P. Fallah
    Funded by Crash Avoidance Metrics Partners LLC (CAMP LLC)
- **Graduate Research Assistant at Computational Imaging Lab**
  University of Central Florida Aug 2015 - present
  - **Statistical Modeling of Convolutional Neural Networks**
    The goal of the project is to explore the underlying mechanics of CNNs and explain the conventional layers through Information Theory and Bayesian Inference. We have shown that ReLU activated models estimate symmetries in the distribution of data as part of their functionality. We proposed a binary tree structure for CNNs imposing the symmetric functionality explicitly.
    Joint work with A. Emad Marvasti, H. Foroosh
- **Independent Research**
  - **Improvement of NEAT Algorithm for reinforcement learning** Fall 2015
    Addressing the population behavior convergence in evolutionary systems caused by fitness functions and improvement of such convergence by introducing Normalized Max Pooled Fitness function in addition to using stochastic activations in training. Stochastic activations seems natural since distribution of actions given observation is not necessarily degenerate due to existence of latent variables. Having such activation functions would also help avoiding local minima. The algorithm was tested by training a Super Mario agent on randomly generated maps in order to achieve generalization.
- **Undergraduate Research Assistant at Image Processing Lab**
  Sharif University of Technology Jul 2012 - Jun 2014
  - **Pedestrian Tracker using Sequential Importance Resampling**
    Assuming planar target motion, we used homology between parallel planes in order to estimate target boundaries and relative depth while constraining state transition function on a planar surface.
    Joint work with A. Emad Marvasti, M. Fotuhi, S. Kasaei

Publications

- **Exploiting Symmetries in Deep CNN and Folded Coding**, Conference on Computer and Robot Vision (2018),
  Ehsan Emad Marvasti, Amir Emad Marvasti, Hassan Foroosh
- **Estimating Vehicular Communication Channel Characteristics from Incomplete Data**, in preparation for submission
  Ehsan Emad Marvasti, Yaser P. Fallah
- **Rediscovering Deep Neural Networks in Finite-State Distributions**, Conference on Neural Information Processing Systems(2018),Submitted
  Amir Emad Marvasti, Ehsan Emad Marvasti, Hassan Foroosh

Project Experience

- **Evolutionary Super Mario AI** goo.gl/31yyv1
  Reimplementation of Super Mario mechanics, map generator and implementation of NEAT-Mario interface.
  Neuroevolution and Generative and Developmental Systems, **Java**, University of Central Florida, Fall 2015
- **Static Camera Pedestrian Tracker** goo.gl/azh6oS
  Implementation of static camera pedestrian tracker using particle filtering. Assuming planar motion constraint.
  B.S Thesis, **Matlab**, Sharif University of Technology, Spring 2014
- **Computer Vision and Image Processing Course Projects** goo.gl/Ytf3BD
  Multi-View 3D reconstruction, Panoramic view, Structure from motion, Image rectification, Image compositing, Histogram of Orientated Gradients (HOG), Support Vector Machine, Human detection using HOG and SVM, Face Recognition using PCA, PCA-LDA, PCA-SVM on Yale Face dataset,
- **Multiplayer Treasure Finder Game over local network** goo.gl/bHRCZ7
  POSIX Socket and Thread API used
  Computer Networks, **C++**, Sharif University of Technology, Spring 2012
- **Improving FreeBSD kernel ULE scheduler** goo.gl/7m3ji8
  Adding slack measure feature to FreeBSD process scheduler in order to improve starvation rate.
  Operating Systems, **C**, Sharif University of Technology, Fall 2011
- **Google Talk client**
  Development of a client side instant messaging system with applet GUI that has the ability to interact with google talk servers based on Jabber/XMPP protocols. The system included voice chat and file transfer feature.
  Advance java Programming, **Java**, Sharif University of Technology, Spring 2008

Related Courses

- Asymptotic Methods, Neuroevolution and Generative and Developmental Systems, 3D Computer Vision, Computer Vision, Computational Methods/Analysis, Random Processes, Inverse Problems, Digital Image Processing, Digital Video Processing, Artificial Intelligence

Teaching Experiences

- **Teaching Assistant**
  - Object Oriented Programming, Summer 2017 — K. Whiting
  - **Recitation Instructor**, Computer Organization, Fall 2016 — S. Angell
  - **Recitation Instructor**, Discrete Mathematics, Summer 2016 — S. Jahani
  - Computer Science 1 C, Spring 2016 — R. Elva
  - Computer Science 1 C, Fall 2015 — S. Szumlanski
  - **Recitation Instructor**,Computer Science 2 Java, Summer 2015 — R. Leinecker
  - Security in Computing, Spring 2015 — M. McAlpin
  - Security in Computing, Fall 2014 — D. Glinos