Mehrdad Hosseinzadeh

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Education

Ph.D., Computer Science, University of Manitoba (G.P.A.: 4.25/4.5)   2017–2021(expected)
Research Field: Computer Vision
Thesis: Temporal and spatial learning systems for vision-text problems (proposed).
Awards:

- Robert Eby Graduate Student Scholarship in Computer Science (2019)
- International Graduate Student Scholarship (2018)
- MITACS Accelerate Internship (2017)
- International Graduate Student Entrance Scholarship (2017)

M.Sc., Computer Engineering, S.B. University of Kerman (G.P.A.: 18.80/20.00)   2013–2016
Major: Artificial Intelligence
Thesis: Proposing ensemble learning algorithms based on fuzzy methods for imbalanced classification.
Awards:

- Recognized Student (Top G.P.A) Award (class of 2015, among 25 students)

B.Sc., Computer Engineering, University of Birjand (G.P.A.: 17.05/20.00)   2009–2013
Major: Software Engineering
Project: Using image processing techniques for handwritten signature verification.
Awards:

- Recognized Student (Top G.P.A) Award (class of 2013, among 86 students)

Interests

Computer Vision, Natural Language Processing, Multi-modal Learning

Research Experience

Computer Vision Lab, University of Manitoba
Winnipeg, MB, Canada.   Jan. 2017–present
Research Assistant, Advised by Dr. Yang Wang
Computer Vision research with a focus on multi-modal learning where the input is expressed in visual and textual format. Projects:

- Personalized image captioning (lead, ongoing)

- Image retrieval for multi-modal queries where user inputs a reference image along with some desired modification expressed in textual modality. Self- and cross-modal attention is used to solve the problem (lead)

- Anticipation of what will happen in the next couple of seconds in a given video stream and generate caption to describe it. It can be used in assisting system for people with visual impairment (lead)

- Segmenting videos given a description of the action and actor (co-lead, ongoing)

- Crowd counting with adaption to a new scene and using meta-learning to adapt to a new scene given a single frame (co-lead)

- Camera pose estimation using unlabeled data (co-lead)

Two Hat Security
Kelowna, BC, Canada.   Jan. 2017–Sept. 2017

Research Intern, Advised by Dr. Yang Wang and Brad Leitch
Funded by MITACS, as a Machine Learning research intern, I collaborated in CEASE.ai
project which aims toward building a ML–based system to automatically find and filter out
child sexual abuse materials from online resources. Internship included:

- Collaborating in an interdisciplinary team of 7 professionals from industry, academia, and law enforcement.

- Project leading in "Protecting The Innocent" international hackathon aiming to connect law enforcement with the computer vision community to protect children online using AI: https://www.twohat.com/blog/hackathon-hopes-stop-online-child-exploitation

Press coverage:

- https://www.twohat.com/cease.ai/

- https://www.mitacs.ca/en/newsroom/media-coverage/ctv-news-winnipeg-u-m-students-working-prevent-child-sex-abuse-images

Fuzzy Systems Lab, S.B. University of Kerman
Kerman, Kerman, Iran.   Sept. 2013–Dec. 2015

Research Assistant, Advised by Dr. Mahdi Eftekhari
Machine Learning research, with a focus on imbalanced classification using soft computing
tools like Fuzzy Sets and Ensemble Learning paradigm. Imbalanced classification
is applicable to a wide variety of problems where data distribution varies across classes.
Projects:

- Studying different over-sampling and under-sampling techniques for handling dataset imbalance issue

- Studying and improving the performance of Rotation Forest algorithm for imbalanced classification using Fuzzy set techniques

**Technical
Skills**

Programming: Python, Matlab, C++, R
Deep learning platforms: PyTorch, TensorFlow
Technologies: Docker, AWS, Kubernetes

Publications

Image Change Captioning by Learning from an Auxiliary Task
Mehrdad Hosseinzadeh and Yang Wang,
Under review at a top tier conference, 2020.

Self-Supervised Auxiliary Learning for Actor and Action Video Segmentation from Natural Language
Linwei Ye, **Mehrdad Hosseinzadeh**, Mrigank Rochan, Yang Wang.
Under review at a top tier conference, 2020.

Video Captioning for Future Frames,
Mehrdad Hosseinzadeh and Yang Wang
Winter Application on Computer Vision (WACV), 2021

Composed Query Image Retrieval Using Locally Bounded Features,
Mehrdad Hosseinzadeh and Yang Wang,
Computer Vision and Pattern Recognition (CVPR), 2020.

Towards Shape Biased Unsupervised Representation Learning for Domain Generalization,
Nader Asadi, **Mehrdad Hosseinzadeh**, Amir M. Sarfi, Mahdi Eftekhari,
Under Review, 2020.

Diminishing the Effect of Adversarial Perturbations via Refining Feature Representation,
Nader Asadi, Amir M. Sarfi, **Mehrdad Hosseinzadeh**, Saba Tahsini, Mahdi Eftekhari,
NeurIPS 2019 Workshop on Safety and Robustness in Decision Making, 2019

*Unsupervised Monocular Iterative Camera Ego Motion Re-estimation and
Depth Estimation Through Compositional Guidance,* Seyed shahabeddin Nabavi,
Mehrdad Hosseinzadeh, Ramin Fahimi, and Yang Wang, WACV 2020.

One-Shot Scene-Specific Crowd Counting, Mohammad Hossain, Omid Chanda,
Mehrdad Hosseinzadeh, and Yang Wang, British Machine Vision Conference, 2019.

Crowd Counting Using Scale-Aware Attention Networks,
Asiful Hossain, **Mehrdad Hosseinzadeh**, Omit Chanda, and Yang Wang,
IEEE Winter Conference on Applications of Computer Vision (WACV), 2018.

*Proposing ensemble learning algorithms based on fuzzy Methods for
imbalanced classification*, **Mehrdad Hosseinzadeh**, M.Sc. Thesis, 2016.

*Improving rotation forest performance for imbalanced data classification
through fuzzy clustering*, **Mehrdad Hosseinzadeh** and Mahdi Eftekhari,
Artificial Intelligence and Signal Processing (AISP), 2016 International
Symposium on. IEEE, 2016.

*Using fuzzy undersampling and fuzzy PCA to improve imbalanced classification
through Rotation Forest algorithm*, **Mehrdad Hosseinzadeh** and Mahdi Eftekhari,
Computer Science and Software Engineering (CSSE), 2015 International Symposium on.
IEEE, 2015.

Professional Service	**Committee Member**, Graduate Students' Representative in Department of Computer Science Graduate Studies Committee, University of Manitoba	2019 – present
	Committee Member, Graduate Students' Representative in the Department of **Committee Member**, Computer Science Award Committee, University of Manitoba	2018 – 2019
	Committee Member, Committee of Graduate Students for Scientific Interdisciplinary Talks, University of Manitoba	2019 – present
	Reviewer, Winter Conference on Application of Computer Vision (WACV)	2018 – present
	Volunteer, Thirty-second Conference on Neural Information Processing Systems (NeurIPS 2018), Montreal, QC	Dec. 2018
	Reviewer, The 6th Iranian joint congress on Fuzzy and Intelligent Systems 17th conference on Fuzzy Systems and 15th conference on Intelligent Systems)	2018
	Speaker, "Using Deep Learning for Age Detection", Protecting the Innocents Hackathon, Vancouver, BC https://www.twohat.com/hackathon-hopes-stop-online-child-exploitation/	Aug. 2017
	Conference Registration Coordinator, First Iranian Conference on Pattern Recognition and Image Analysis (PRIA), Birjand, Iran	Mar. 2013