# Elahe Vahdani

**Ph.D. Candidate, Computer Science**

*The Graduate Center of CUNY, 365 5th Ave, New York, NY 10016*

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## Summary

Ph.D. candidate in computer science, with thorough knowledge in algorithms, statistics, and machine learning.

Skilled in developing deep learning algorithms in broad areas of computer vision.

Proficient skills in programming and data visualization in Python and R.

## Education

**The City University of New York** — New York, NY

*Ph.D. Candidate, Computer Science* — *03/2022 (expected)*

*Master of Philosophy (MPhil) in Computer Science (GPA:* 3.74/4.0 *)*

- **Research:** Focused on video analysis tasks with deep learning methods such as action recognition, and action detection. Also, researched on self-supervised feature learning, facial expression analysis, object detection with cross-modality bridging, and vehicle re-identification.
- **Adviser:** Prof. YingLi Tian

**Sharif University of Technology** — Tehran, Iran

*B.S. in Mathematics and Computer Science (GPA:* 3.2/4.0*)* — *2009 – 2014*

## Professional Experience

**Data Science Intern, Expedia Group** — Summer 2021

Designed computer vision algorithms for image scene classification, and improved the robustness of scene classifier against noise and artifacts. The advantage of designing such scene classifier is to make the content of large-scale image dataset more accessible and well-structured.

**Graduate Researcher, The City University of New York** — Sep 2015 – Present

– **Continuous and Isolated Sign Language Recognition (NSF Project)** (*Sep 2018 – Sep 2020*)
- Proposed the first framework for automatic detection of grammatical mistakes in continuous signing videos.
- Proposed a novel 3DCNN based framework for isolated sign language recognition from RGB-D videos.
- Outperformed the existing methods for hand gesture recognition on Chalearn IsoGD dataset.

– **Object Detection with Cross-Modality Bridging** (*March 2020 – June 2020*)
- Designed a novel cross-modal network for modality bridging between mesh, point-cloud, and images.
- Significantly outperformed the state-of-the-art methods on cross-modal retrieval for 3D shapes.

– **Automatic Estimation of Pain Intensity from Facial Expression** (*June 2019 – Oct 2019*)
- Designed a deep-learning based method to estimate the pain intensity in videos of patients.
- The estimated pain levels were consistent with self-reported measures.

– **Multi-camera Vehicle Tracking and Re-identification on AI City Challenge** (*Feb 2019 – April 2019*)
- Proposed an enhanced multi-granularity network to extract visual features from vehicles.
- The method outperformed the state-of-the-art vehicle ReID methods significantly (by 16.3%) on Veri dataset.

– **Approximation Algorithms for Scheduling Problems in Sensor Networks** (*2017 – 2018*)
- Designed an efficient approximation algorithm for a novel NP-hard problem in scheduling system.

**System Developer, The City University of New York** — Sep 2015 – Present

– **Educational Tool for Sign Language Students (NSF Project)**(*April 2019 – April 2020*)
- Developed an educational software using deep-learning methods to process continuous sign language videos.
- The software provides an automatic and immediate feedback regarding the fluency of signing to the students.

## Technical Skills

**Technical Tools**

- **Programming Languages:** Python, C++, Java, MATLAB, R, SQL.
- **Python/Deep Learning Libraries:** PyTorch, Tensorflow, TensorboardX, NumPy, Matplotlib, pandas, H5Py.
- **Machine Learning/Data Analysis:** Apache Spark, Hadoop, Mahout, Weka, Rapid Miner, Scikit-learn.
- **General:** Linux, Git, Docker, VS Code, Visual Studio, Eclipse, OpenCV, LaTeX.

**Related Knowledge**

- **Computer Vision:** Image Processing, Video Analysis, Action Recognition and Detection, Human Pose Estimation, Object Detection, Semantic Segmentation, Facial Expression Analysis, Vehicle Re-identification and Tracking.
- **Machine Learning:** Classification, Regression, Self-Supervised, Unsupervised, Semi-Supervised Learning, Reinforcement Learning, Transfer Learning, Domain Adaptation, Adversarial Learning, Few-shot Learning.
- **Deep Learning:** RNN, CNN, BiLSTM, Autoencoders, VAEs, GANs.
- **General CS Knowledge:** Algorithms, Data Structures, Probability and Statistics, Linear Algebra, Pattern Recognition, Database, Graphs, Randomized Algorithms, Network Systems, Stochastic Process, Signal Processing.

## Teaching Experience

**Adjunct Lecturer, The City University of New York** Feb 2018 – Present

- CSc 21700 - Probability and Statistics *(at City College)* 2018, 2019, 2020
- CSc 22000 - Algorithms *(at City College)* Spring 2018, Summer 2020
- CSci 235 - Software Design and Analysis II *(at Hunter College)* Spring 2018

## Publications

[1] **E. Vahdani**, A. Nejat, L. Jing, Y. Tian, "Coherent-contrastive cues for temporal action detection", *preprint*, 2021.

[2] **E. Vahdani** and Y. Tian, "Action detection in untrimmed videos with deep learning models: A survey," *preprint*, 2021.

[3] L. Jing, **E. Vahdani**, J. Tan, and Y. Tian,"Cross-modal Center Loss", *CVPR* 2021.

[4] **E. Vahdani**, L. Jing, Y. Tian, and M. Huenerfauth, "Recognizing american sign language nonmanual signal grammar errors in continuous videos", *ICPR*, 2020.

[5] S. Hassan, L. Berke, **E. Vahdani**, L. Jing, Y. Tian, and M. Huenerfauth, "An isolated-signing rgbd dataset of 100 american sign language signs produced by fluent asl signers", *LREC* 2020.

[6] L. Jing, **E. Vahdani**, M. Huenerfauth, and Y. Tian, "Recognizing american sign language manual signs from rgb-d videos", *preprint*, 2019.

[7] Y. Chen, L. Jing, **E. Vahdani**, L. Zhang, M. He, and Y. Tian, "Multi-camera vehicle tracking and re-identification on AI city challenge 2019", *CVPR Workshops*, 2019.

[8] **E. Vahdani**, A. Bar-Noy, M. P. Johnson, and T. Abdelzaher, "Gathering information in sensor networks for synchronized freshness", *IEEE SECON*, 2017.

## Honors and Awards

N2 Women - IEEE Communications Society Grant 2018

Doctoral Student Research Grant, CUNY 2017

Science Fellowship, Awarded by City University of New York 2015

Bronze Medal in National Informatics Olympiad, Iran 2007

## Service

Reviewer for IEEE Transactions on Multimedia (**TMM**), Transactions on Circuits and Systems for Video Technology (**TCSVT**), Computer Vision and Image Understanding (**CVIU**), Journal of Machine Vision and Applications (**MVAP**), and Journal of Visual Communication and Image Representation (**JVCI**).