Elahe Vahdani

Ph.D. Candidate, Computer Science

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Summary

Current Ph.D. Candidate in Computer Science

- Researcher in Computer Vision with Proficient Programming Skills.

Looking for Internships for Summer 2021

- Interested in **Machine Learning**, **Computer Vision**, **Data Analysis**, and **Software Engineering**.

Education

The City University of New York — New York, NY

Ph.D. Candidate, Computer Science — *2015 – Present*

Master of Philosophy (MPhil), Computer Science

- **Adviser:** Prof. YingLi Tian
- **Research:** Currently, I'm working on Action Recognition, and Temporal Action Detection tasks, and am interested in designing algorithms with limited supervision, such as self-supervised and weakly-supervised learning. I have also worked on Facial Expression Analysis, Cross-Modality Bridging and Vehicle Re-identification projects. Prior to that, my research was focused on Approximation Algorithms for NP-Hard problems.
- **GPA:** 3.74/4.0 (62 credits Ph.D. level courses from CUNY, Columbia University, and NYU)

Sharif University of Technology — Tehran, Iran

B.S. in Mathematics and Computer Science — *2009 – 2014*

Technical Skills

Programming Languages

- Proficient: Python
- Familiar with: C++, Java, MATLAB, R, LaTeX

Related Knowledge

- **Computer Vision:** Action Recognition, Temporal Action Detection, Self-Supervised Learning, Facial Expression Analysis, Cross-Modality Bridging, Vehicle Re-identification.
- **Deep Learning:** RNN, CNN, BiLSTM, Autoencoders, VAEs, CVAE, GANs.
- **Deep Learning Libraries:** PyTorch, Tensorflow, TensorboardX
- **Algorithms and CS Knowledge:** Big-O Analysis, Data Structures, Sorting, Trees, Graphs, Hashing, Heaps, Dynamic Programming, Recursion, BFS, DFS.

Technical Software/Library

- Git, Docker, VS Code, Visual Studio, Eclipse, OpenCV, NumPy, Matplotlib, pandas, SciPy, H5Py.

Professional Experience

Continuous Sign Language Recognition (National Science Foundation Project) — 2018 – 2020

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

- We designed and developed an educational tool for sign language students to automatically process their signing videos and send them an automatic immediate feedback regarding the fluency of their signing. The framework is based on deep-learning algorithms for temporal detection of grammatically important elements from continuous signing videos, recognition of the elements, and checking their correspondence in multiple modalities such as facial expression, head movements and hand gestures. Our system was able to detect the grammatical mistakes and correct signings and provided immediate feedback to students via email.

Automatic Estimation of Pain Intensity from Facial Expression 2019 – 2020
The City University of New York &CMU

- **Project Manager:** Zakia Hammal (Principal Project Scientist at CMU)
- We designed a deep-learning based method to estimate the pain intensity in patients with shoulder pain, from their facial expressions in the given videos. The results were compared with self-reported pain levels as the ground-truth.

Approximation Algorithms for Scheduling Problems in Sensor Networks 2016 – 2017
The City University of New York *New York, NY*

- Designed an approximation algorithm for the optimization problem of scheduling a set of n given jobs with their specific deadlines via a minimum number of channels in a sensor network. We proved the problem is NP-hard and provided a $\mathcal{O}(\log n)$- approximation algorithm.

Teaching Experience

Adjunct Lecturer, The City College of CUNY New York, NY
CSc 21700: Probability and Statistics *2018, 2019, 2020*
CSc 22000: Algorithms *Spring 2018, Summer 2020*

Adjunct Lecturer, The Hunter College of CUNY New York, NY
CSci 235: Software Design and Analysis II *Spring 2018*

Teaching Assistant, The City College of CUNY New York, NY
I2200: Digital Image Processing *Fall 2018*

Publications

1) **E. Vahdani**, L. Jing, Y. Tian, and M. Huenerfauth, "Recognizing american sign language nonmanual signal grammar errors in continuous videos", *ICPR*, 2020.
2) **E. Vahdani**, A. Bar-Noy, M. P. Johnson, and T. Abdelzaher, "Gathering information in sensor networks for synchronized freshness", *IEEE SECON*, 2017.
3) **E. Vahdani** and Y. Tian, "Action detection in untrimmed videos with deep learning models: A survey," *preprint*, 2020.
4) L. Jing, **E. Vahdani**, J. Tan, and Y. Tian,"Cross-modal center loss", *arXiv preprint*, 2020.
5) L. Jing, **E. Vahdani**, M. Huenerfauth, and Y. Tian, "Recognizing american sign language manual signs from rgb-d videos", *arXiv preprint*, 2019.
6) 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.
7) 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.

Honors and Awards

IEEE SECON 2017 - NSF Student Travel Grant Award 2018
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**).