Masood Delfarah

Ph.D. Candidate

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EDUCATION

Department of Computer Science and Eng., The Ohio State University
Ph.D. candidate in Computer Engineering Fall 2013 – Present
M.Sc. in Computer Engineering Fall 2013 – Spring 2018
Perception and Neurodynamics Laboratory (PNL)
Supervisor: Professor DeLiang Wang

School of Electrical and Computer Engineering, The University of Tehran
B.Sc. in Computer Engineering Fall 2008 – Spring 2013

RESEARCH INTERESTS

Monaural Speech Enhancement
Speech Dereverberation
Microphone Array Speech Processing
Automatic Speech Recognition
Deep Learning
Statistical Machine Learning

COMPUTER SKILLS

C/C++, **MATLAB**, **Python**, Java, and Unix shell script
Machine learning toolboxes: **Tensorflow**, Caffe, HTK, PyTorch, and MXNet
Other skills: Git and LaTeX

RESEARCH EXPERIENCE

Graduate Research:

- Feature study for two-talker speech separation in reverberant conditions:
  - Utilized parallel computation and GPU servers on the Ohio Supercomputing Center for large-scale DNN training for speech separation.
  - Investigated a wide range of acoustic-phonetic features and designed novel feature combinations based on feature selection methods.
- DNN-based two-talker separation algorithm:
  - Designed and implemented two-talker separation algorithm.
  - Deployed a development set to optimize the performance of the DNN by studying various architectures and regularization method.
  - Collaborated with The Speech Psychoacoustics Laboratory at The Department of Speech and Hearing Science to perform speech intelligibility tests on human listeners.
  - Perform statistical analysis on the test results and report substantial intelligibility improvement for hearing-impaired listeners.
- Designed and implemented a two-stage DNN to perform joint dereverberation and speech denoising.
- Investigated two-talker speaker identification in reverberant mixtures.
- Studied microphone array methods for dereverberation of simulated and recorded reverberant speech signals.
- Collaborated with lab members to study open-set speaker separation methods:
  - Successfully implemented deep clustering, deep attractor network, and permutation invariant training algorithms.
  - Utilized distributed computation over a grid of nodes and GPU servers to perform data parallelism in Tensorflow.
  - Evaluated performance of the algorithms in reverberant conditions.
- Performed pitch-tracking and speech segmentation based on the techniques in Computational Auditory Scene Analysis (CASA) using Java.

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- Evaluated effect of augmenting object detection into visual question answering (VQA) algorithms.
- Studied transfer learning in the reinforcement learning framework (ongoing project).

Undergraduate research:

- **(B.Sc. Thesis)** Designed and implemented a decision tree to classify learning styles of toddlers, using the ECLS-K dataset provided by U.S. Department of Education (Supervisor: Dr. Maryam S. Mirian).

PROFESSIONAL EXPERIENCE

Reviewer:

- IEEE/ACM Transactions on Audio, Speech, and Language Processing
- Speech Communication

Graduate Teaching Assistant, The Ohio State University:

- Modeling and Problem Solving with Spreadsheets and Databases Spring 2017
- Modeling and Problem Solving with Spreadsheets and Databases Spring 2014
- Foundations I: Discrete Structures Fall 2013

Undergraduate Teaching Assistant, The University of Tehran:

- Design and Analysis of Algorithms Spring 2012
- Discrete Mathematics Spring 2012
- Artificial Intelligence Fall 2011

PUBLICATIONS AND PRESENTATIONS

Journal papers:

- Eric W. Healy, **Masood Delfarah**, Jordan L. Vasko, Brittney L. Carter, and DeLiang Wang, "An algorithm to increase intelligibility for hearing-impaired listeners in the presence of a competing talker" *The Journal of the Acoustical Society of America*, vol. 141, pp. 4230−4239, 2017.
- **Masood Delfarah** and DeLiang Wang, "Features for masking-based monaural speech separation in reverberant conditions" *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, vol. 25, pp. 1085−1094, 2017.
- Maryam S. Mirian, **Masood Delfarah**, and Behzad Moshiri, "Proposing a Unified Knowledge and Experience-based System using Information Fusion Approach to Facilitate the Disaster Management Process" *Disaster Management Knowledge Quarterly* (in Persian), vol. 2, pp. 215−227, 2012.

Conference papers:

- **Masood Delfarah** and DeLiang Wang,"A feature study for masking-based reverberant speech separation" *Proceedings of INTERSPEECH-16*, pp. 555−559, 2016.

Selected poster presentations:

- Eric W. Healy, **Masood Delfarah**, Jordan L. Vasko, and Brittney L. Carter, and DeLiang Wang, "Can a trained deep neural network be implemented into hearing technology?" *Acoustics '17 Boston*, 2017.
- Eric W. Healy, **Masood Delfarah**, Jordan L. Vasko, Brittney L. Carter, and DeLiang Wang, "An algorithm to increase intelligibility for hearing-impaired listeners in the presence of a competing talker" *Acoustics '17 Boston*, 2017.