

# FATEMEH PISHDIAN

1311, Chicago Avenue APT 105, Evanston, IL 60201

(703) 598-1608 • fpishdian@u.northwestern.edu

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## EDUCATION

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**Northwestern University (NU)** Evanston, IL • PhD in Electrical Engineering and Computer Science 2015-Present  
GPA: 3.87/4.00 • Advisor: Dr. Bryan Pardo

**George Mason University (GMU)** Fairfax, VA • M.Sc. in Electrical and Computer Engineering 2014  
GPA: 3.97/4.00 • Advisor: Dr. Jill Nelson

**Master's Thesis:** An Instance-based Classification Approach to Automatic Transcription of Monophonic Melodies

**Ferdowsi University of Mashhad (FUM)** Mashhad, Iran • B.Sc. in Electrical Engineering 2005  
GPA: 15.95/20

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## SKILLS

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- Signal Processing
- Machine Learning
- Statistical Inference and Bayesian Analysis
- Computer skills: MATLAB & Simulink, Python, PyTorch and Chainer deep learning libraries, R, AMPL, L<sup>A</sup>T<sub>E</sub>X

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## RESEARCH EXPERIENCE

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**Interactive Audio Lab, NU (Evanston, IL)** Summer 2015-Present

- Development of multi-cue audio source separation algorithms
- Design of new audio signal representations for audio source separation, audio search, and classification
- Design of deep learners for audio source separation, separation evaluation, and classification

**Mitsubishi Electric Research Laboratories (MERL) (Cambridge, MA)** Spring and Summer 2019

- Position: Intern
- Worked on: Deriving and implementing new models and optimization methods for audio source separation in challenging multi-source scenarios, using advanced machine learning techniques

**Knowles Intelligent Audio (Mountain View, CA)** Summer 2017

- Position: Audio Processing Algorithms Intern
- Worked on: Speech enhancement and speech/music separation via deep learning

**Ocean Acoustics & Signal Processing Lab, GMU (Fairfax, VA)** Fall 2010-Spring 2015

- Development of pitch estimation techniques for musical signals
- Automatic transcription of mono/polyphonic piano music

**Signal Processing Research Lab, (FUM) (Mashhad, Iran)** 2004-2006

- Radar scan pattern recognition through analysis of the received signal in an intercept point (Electronic Intelligence (ELINT) Site)

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## TEACHING EXPERIENCE

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**Department of Electrical Engineering and Computer Science, NU (Evanston, IL)**

- Teaching Assistant in Machine Learning Fall 2017, Fall 2019
- Teaching Assistant in Machine Perception of Music Winter 2015, Winter 2016, Winter 2018

**Department of Electrical and Computer Engineering, GMU (Fairfax, VA)** Fall 2013, Fall 2014

- Teaching Assistant in Introduction to Signal Analysis Lab

**Department of Electrical and Computer Engineering, GMU (Fairfax, VA)** Fall 2010 - Summer 2012

- Teaching Assistant in Introduction to Signal Analysis Lab

**School of Music, GMU (Fairfax, VA)** Spring 2010

- Teaching Assistant in Music and Computer Technology Lab

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## HONORS AND AWARDS

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- Outstanding Academic Achievement Award, Volgenau School of Engineering, GMU Spring 2014
- Provost Scholarship, GMU Fall 2012 - Summer 2013
- Admission to the First Acoustical Society of America (ASA) School, Kansas City, MO Oct. 2012
- Volgenau School of Engineering Academic Fellowship, GMU Fall 2011 - Spring 2012
- Ranked 3rd in FAJR Music Festival - alto singer in Aria Amateur Choir, Teheran, Iran 2007
- Ranked 377 among more than one million students in the nationwide university entrance exam, Iran 2000

## PUBLICATIONS & PRESENTATIONS

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- **Fatemeh Pishdadian**, Bongjun Kim, Prem Seetharaman, Bryan Pardo. “Classifying non-speech vocals: deep vs signal processing representations,” *Workshop on Detection and Classification of Acoustic Scenes and Events (DCASE)*, 2019.
- **Fatemeh Pishdadian**, Bryan Pardo. “Multi-resolution Common Fate Transform,” *IEEE/ACM Transactions on Audio, Speech, and Language Processing*, 2018.
- Ethan Manilow\*, Prem Seetharaman\*, **Fatemeh Pishdadian\***, Bryan Pardo. “Predicting algorithm efficacy for adaptive multi-cue source separation,” *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, 2017.  
(\* these authors contributed equally to this paper)
- Prem Seetharaman, **Fatemeh Pishdadian**, Bryan Pardo. “Music/voice separation using the 2D Fourier transform,” *IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA)*, 2017.
- **Fatemeh Pishdadian**, Bryan Pado, Antoine Liutkus. “A multi-resolution approach to common fate-based audio separation,” *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2017.
- **Fatemeh Pishdadian** and Jill K Nelson. “On the transcription of monophonic melodies in an instance-based pitch classification scenario,” *IEEE Digital Signal Processing and Signal Processing Education Workshop (DSP/SPE)*, 2013.
- **Fatemeh Pishdadian** and Jill K Nelson. “Automatic Transcription of Monophonic Piano Music,” Public presentation at the 164th Acoustical Society of America (ASA) Meeting, Kansas City, MO, Oct. 2012.

## SERVICES & OUTREACH

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- Conference reviewer, International Society for Music Information Retrieval (ISMIR) 2018
- Conference reviewer, IEEE International Conference on Acoustics, Speech and Signal Processing 2016, 2017
- Conference reviewer, ACM Multimedia 2016
- Presented the NU Computer Science Department at Grace Hopper Celebration 2017
- Redesign of the lab manual with a multimedia approach (supported through an educational grant from the Office of Student Scholarship, Creative Activities, and Research (OSCAR) at GMU) 2014

## MEMBERSHIPS

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- Institute of Electrical and Electronics Engineers (IEEE)
- Acoustical Society of America (ASA)

## REFERENCES

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- Bryan Pardo, PhD, Professor, Department of Electrical Engineering and Computer Science, NU  
Email: pardo@northwestern.edu
- Gordon Wichern, PhD, Principal Research Scientist, MERL  
Email: wichern@merl.com
- John Woodruff, PhD, Audio Research and Development, Apple  
Email: j\_woodruff@apple.com