Pejman Mowlaee

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Google-scholar

Research Interests

- **Speech signal processing:** noise reduction, source separation, automatic speech recognition, beamforming.
- **Digital signal processing in audiology:** audiology and assistive listening technology (hearing aid)
- **Statistical signal processing:** detection and estimation of signal parameters in noise
- **Machine learning:** applications in human-machine interaction, machine listening and audio classification.
- **Forensic:** speaker recognition, anti-spoofing
- **Communication:** GSM data transmission, digital video broadcasting (DVB).

Education

Dr. Habil, Privatdozent, *TU Graz, Austria*. **2012-2017**

- **Habilitation**, Venia Docendi for Speech Signal Processing, TU Graz
- **Thesis:** *Phase-Aware Speech Signal Processing in Speech*

PhD in Signal Processing, *Aalborg University, Aalborg, Denmark*. **2007-2010**

- **Funding programme:** Marie Curie EST-SIGNAL Fellowship
- **Supervisors:** *Prof. Søren Holdt Jensen*, Prof. Mads Græsboll Christensen
- **Thesis:** *New Stategies for Single-channel Speech Separation*

M.Sc. in Communication Systems, *Iran University of Science and Technology, Tehran, Iran*. **2004-2006**

- **Funding programme:** Iran Telecommunication Research Centre (ITRC)
- **Thesis:** *Microphone Arrays Noise reduction and DOA estimation*
- **Supervisor:** *Prof. Mohammad Hossein Kahaei*

B.Sc. in Electrical Engineering, *Guilan University, Rasht, Iran*. **2000–2004**

- **Thesis:** *Adaptive Filters and their application in echo cancellation*
- **Supervisor:** *Dr. Bahman Zanj*

Previous work experience

Adjunct Associate Professor, *TU Graz, Austria*. **2017-now**

Assistant Professor, Privat dozent, *TU Graz, Austria*. **2012-2017**

Marie Curie Post-doc fellow, *Ruhr Universität Bochum, Germany*. **2011-2012**
for Digital Signal Processing in Audiology (AUDIS)

Research and development for signal processing algorithms, Digital Video Broadcasting, *Tehran, Iran*. **2005-2006**

Research and development for signal processing algorithms, *Telecommunication and Electronic Research Center Ltd., Tehran, Iran*. **2006-2007**

Computer Skills

Languages: C, C++, Matlab, Python, R, LabVIEW
Frameworks: machine learning and deep learning toolboxes and libraries
Others: HTML, visual basic (Intermediate), LaTeX, Microsoft Office
Operating System: Linux, Windows

Scientific and Societal Impact of Research

Open-Source Projects: Phase-aware processing Toolbox (**PhaseLab**)

Linguistic Skills

- Persian (maternal), English (fluent), German (working proficiency B2 module), Danish (basic)

Research funding, Group Leadership and Supervision

- 12.2014-06.2015: Initial Funding, employed three master students, project entitled "Phase-based Voice Communication", Austria, 7000 € (status: completed).
- 12.2015-01.2018: Team leader and principal investigator (PI) for FWF standalone research project from Austrian research fund (FWF) for 10.2015 - 10.2018, assigned to PI.

Honors

- Ranked 1st distinction in B.Sc. Program in Electrical Engineering Guilan University, Iran 2000-2004.
- Young research award for M.Sc. Program at Iran University of Science and Tech., Iran 2004-2006.
- Ranked 1st distinction in M.Sc. Program in Communication Engineering at Iran University Tech., 2004-2006.
- Third Place National Award in Master Theses in Electrical Engineering, 2006.
- EU Marie-Curie doctoral scholarship at Aalborg University 2009-2010.
- EU Marie-Curie postdoctoral scholarship for postdoctoral fellowship 2011-2012.
- Innovation Award at TU Graz 2015 in speech signal processing (awarded 06.2017)

Merits in Teaching and Pedagogical Competence

- Circuit Theory I and II (BSc course/three semesters)
- Digital Signal Processing (BSc course/four semesters)
- Speech Signal Processing (Graduate course/five semesters)
- Adaptive Filter Theory (Graduate course/four semesters)
- Digital Signal Processing Lab (BSc course/three semesters)
- Speech Processing Lab (Graduate course/five semesters)
- Advanced seminars in signal processing (Graduate course/two semesters)
- Master Seminar in sound engineering (Graduate course/five semesters)

Most Recent Publications ([B] Books, [J] Journals, [C] Conferences)

[B1] P. Mowlaee, J. Kulmer, J. Stahl, F. Mayer, Single Channel Phase-Aware Signal Processing in Speech Communication: Theory and Practice, John Wiley & Sons, Dec. 2016.

[J1] J. Stahl, P. Mowlaee, A Pitch-Synchronous Simultaneous Detection-Estimation Framework for Speech Enhancement, IEEE Transactions on Audio, Speech and Language Processing, in press, Nov. 2017.

[J2] P. Mowlaee, M. Blass, and B. Kleijn, New Results in Modulation-Domain Single-Channel Speech Enhancement, IEEE Transactions on Audio, Speech and Language Processing, vol. 25, Iss. 11, pp. 2125-2137, Nov. 2017.

[J3] F. Mayer, D. Williamson, P. Mowlaee, D. Wang, Phase Estimation for Improved Single-Channel Source Separation based on Time-Frequency Masking, Journal of Acoustic Society of America, vol. 141, no. 6, 2017.

[J4] P. Mowlaee, J. Stahl, J. Kulmer, Iterative joint MAP single-channel speech enhancement given non-uniform phase prior, Speech Communication, vol. 86, C, pp. 85-96, February 2017.

[J5] P. Mowlaee, R. Saeidi, Y. Stylianou, Advances in phase-aware signal processing in speech communication, Speech Communication Elsevier, vol. 81, pp. 1-29, July 2016.

[J6] P. Mowlaee, J. Kulmer, Harmonic Phase Estimation in Single-Channel Speech Enhancement Using Phase Decomposition and SNR Information, IEEE Trans. on Audio, Speech, and Language Proc., vol. 23, no. 9, pp.1521-1532, Sept. 2015.

[J7] P. Mowlaee, J. Kulmer, Phase Estimation in Single-Channel Speech Enhancement: Limits-Potential, IEEE Trans. on Audio, Speech, and Language Proc., vol. 23, no. 8, pp. 1283-1294, August 2015.

[J8] J. Kulmer, P. Mowlaee, Phase Estimation in Single-Channel Speech Enhancement Using Phase Decomposition, IEEE Signal Processing Letters, vol. 22, no. 5, pp. 598–602, May, 2015.

[C1] M. Pirolt, J. Stahl, P. Mowlaee, V. I. Vorobiov,S. Y. Barysenka, A. G. Davydov, Phase Estimation in Single-Channel Speech Enhancement Using Phase Invariance Constraints, ICASSP, 2017.

[C2] T. Schrank, L. Pfeifenberger, M. Zöhrer, J. Stahl, P. Mowlaee, and F. Pernkopf, "Deep Beamforming and Data Augmentation for Robust Speech Recognition: Results of the 4th CHiME Challenge', 2016.

[C3] J. Stahl, P. Mowlaee, Iterative Harmonic Speech Enhancement, ITG, in Proc., 2016.

[C4] J. Fahringer, T. Schrank, J. Stahl, P. Mowlaee, F. Pernkopf, Phase-Aware Signal Processing for Automatic Speech Recognition,

INTERSPEECH, 2016.