

Pejman Mowlae

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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 Strategies 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, Basamad Negar Ltd., 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

Journals

- [J1] 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.
- [J2] 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.
- [J3] 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.
- [J4] 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.
- [J5] 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.
- [J6] 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.
- [J7] 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.

Conferences

- [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.