



DR. AKHILESH MIMANI
ASSISTANT PROFESSOR,
DEPT. OF MECHANICAL ENGINEERING

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CURRICULUM VITAE

Professional Experience

- Assistant Professor, Department of Mechanical Engineering, Indian Institute of Technology Kanpur (IITK) Kanpur 208 016 Uttar Pradesh India, December 2018 onwards.
- Assistant Professor, School of Engineering and Applied Sciences, Ahmedabad University, Ahmedabad 380 009 Gujarat India, June 2018 up to December 2018.
- Post-Doctoral Research Associate: Centre for Audio, Acoustics and Vibration, University of Technology Sydney NSW 2007, October 2017 up to May 2018.
- Post-Doctoral Research Associate: School of Mechanical and Manufacturing Engineering, University of New South Wales, NSW 2052, August 2016 up to September 2017.
- Post-Doctoral Research Associate: Energy Pipelines CRC Project – “Gas-Pipeline blowdown: Characteristics of natural gas pipeline blowdown in remote areas”, School of Mechanical Engineering, The University of Adelaide, SA – 5005, July 2015 up to July 2016.
- Post-Doctoral Research Associate, Australian Research Council (ARC) Discovery Project “Resolving the mechanics of turbulent noise production”, School of Mechanical Engineering, The University of Adelaide, SA – 5005, April 2012 up to June 2015.

Educational Qualifications

- Doctor of Philosophy in Mechanical Engineering (Muffler Acoustics) – completed on March 2012, Facility for Research in Technical Acoustics, Department of Mechanical Engineering, Indian Institute of Science, Bangalore – 560012, India.
Thesis Supervisor: Professor (Emeritus) M. L. Munjal
- Bachelors of Engineering (Mechanical), First Class with Distinction, Graduated in June 2006 from Rashtreeya Vidyalaya College of Engineering, Bangalore – 560 059, India under Visvesvaraya Technological University.

Research Profile

My background and research interests, in general, pertain to different disciplines within Acoustics, namely

1. Muffler and Duct Acoustics, Noise Control Engineering
2. Computational Techniques in Acoustics and Aeroacoustics
Finite Difference Time Domain, Finite Element Method
3. Array Processing Techniques such as Time-Reversal (TR) and Conventional Beamforming (CB) methods applied to Experimental aeroacoustic source localisation

Research Profile & Outputs

(Thesis, Monographs, Book chapters, Journals and Conferences)

Google Scholar profile: <https://scholar.google.com.au/citations?user=T8Fxz8gAAAAJ&hl=en&oi=ao>

ResearchGate profile: https://www.researchgate.net/profile/Akhilesh_Mimani2

Doctor of Philosophy Thesis

1-D and 3-D Analysis of Multi-port Muffler configurations with emphasis on Elliptical Cylindrical Chamber

URL: <http://etd.iisc.ac.in/handle/2005/1931>

Monograph

1. Mimani, A., “*Acoustic Analysis of Elliptical Cylindrical Mufflers: Application to Automotive Muffler Design*” to be published by Springer (Springer-Brief)

<http://www.springer.com/gp/book/9789811048272#aboutBook>

Present Status: Manuscript preparation in-progress, will be published/available online in 2019.

Book Chapters

1. Mimani, A. (2014). “Three-Dimensional Waves along Elliptical Ducts” In M. L. Munjal, *Acoustics of Ducts and Mufflers – With Application to Exhaust and Ventilation System Design*, Chapter 1, Subsection 1.8, pp. 34-38, John Wiley and Sons, 2nd Edition, ISBN 978-1-118-44312-5 (Print) 978-981-4434-73-7 (Online).
2. Mimani, A. (2014). “Design of Short Elliptical and Circular Chambers” In M. L. Munjal, *Acoustics of Ducts and Mufflers*, Chapter 8, Subsection 8.11, pp. 353-361, John Wiley and Sons, 2nd Edition, ISBN 978-1-118-44312-5 (Print) 978-981-4434-73-7 (Online).

<http://au.wiley.com/WileyCDA/WileyTitle/productCd-1118443128,subjectCd-PH51.html>

Citations: Google Scholar

1. **Mimani, A.**, Fischer, J., Moreau, D. J. and Doolan, C. J., (2018), “A comparison of time-reversal and cross-spectral beamforming for localizing experimental rod-airfoil interaction noise sources.” *Mechanical Systems and Signal Processing*, 111, pp. 456-491.
<https://www.sciencedirect.com/science/article/pii/S0888327018301481> Citations: 0
2. Croaker, P., **Mimani, A.**, Doolan, C. J. and Kessissoglou, N., (2018), “A computational flow-induced noise and time-reversal technique for analysing aeroacoustic sources.” *The Journal of the Acoustical Society of America*, 143(4), pp. 2301-2312.
<https://asa.scitation.org/doi/abs/10.1121/1.5031113> Citations: 0
3. **Mimani, A.**, Porteous, R., Doolan, C. J., (2017), “A simulation-based analysis of the effect of a reflecting surface on aeroacoustic time-reversal source characterization and comparison with beamforming.” *Wave Motion*, 70, pp. 65-89.
<http://www.sciencedirect.com/science/article/pii/S0165212516300580> Citations: 7
4. **Mimani, A.** and Munjal, M. L. (2016), “Design of reactive rectangular expansion chambers for broadband acoustic attenuation performance based on optimal port location.” *Acoustics Australia*, 44(2), pp. 299-323.
<http://link.springer.com/article/10.1007%2Fs40857-016-0053-8> Citations: 0
5. **Mimani, A.**, Prime, Z., Moreau, D. J. and Doolan, C. J. (2016), “Erratum: An experimental application of aeroacoustic time-reversal to the Aeolian tone.” *The Journal of the Acoustical Society of America*, 140(1), pg. 191.
<http://scitation.aip.org/content/asa/journal/jasa/140/1/10.1121/1.4954719>
6. **Mimani, A.**, Prime, Z., Moreau, D. J. and Doolan, C. J. (2016), “An experimental application of aeroacoustic time-reversal to the aeolian tone.” *The Journal of the Acoustical Society of America*, 139(2), pp. 740-763.
<http://scitation.aip.org/content/asa/journal/jasa/139/2/10.1121/1.4941564> Citations: 8
7. **Mimani, A.** and Munjal, M. L. (2016), “Acoustic end-correction in a flow-reversal end chamber muffler: A semi-analytical approach.” *Journal of Computational Acoustics*, 24(2), 1650004, pp. 1-44.
<http://www.worldscientific.com/doi/abs/10.1142/S0218396X16500041> Citations: 8
8. **Mimani, A.**, Moreau, D. J., Prime, Z. and Doolan, C. J. (2016) “Enhanced focal-resolution of dipole sources using aeroacoustic time-reversal in a wind tunnel” *Mechanical Systems and Signal Processing*, 72-73, pp. 925-937.
<http://www.sciencedirect.com/science/article/pii/S0888327015004495> Citations: 9

9. **Mimani, A.**, Doolan, C. J. and Medwell, P. R. (2015) “Stability and accuracy of aeroacoustic Time-Reversal using the Pseudo-Characteristic Formulation.” *International Journal of Acoustics and Vibration*, 20(4), pp. 226-243.
http://iiav.org/ijav/index.php?va=viewpage&vaid=177&id_number=76 Citations: 8
10. **Mimani, A.**, Prime, Z., Doolan, C. J. and Medwell, P. R. (2015) “A sponge-layer damping technique for aeroacoustic Time-Reversal.” *Journal of Sound and Vibration*, 342(1), pp. 124-151.
<http://www.sciencedirect.com/science/article/pii/S0022460X14009687> Citations: 16
11. **Mimani, A.**, Doolan, C. J. and Medwell, P. R. (2014) “Enhancing the focal-resolution of aeroacoustic Time-Reversal using a point-sponge-layer damping technique.” *The Journal of the Acoustical Society of America*, 136(3), EL199-EL205.
<http://scitation.aip.org/content/asa/journal/jasa/136/3/10.1121/1.4890204> Citations: 9
12. **Mimani, A.**, Doolan, C. J. and Medwell, P. R. (2013). “Multiple line arrays for the characterization of aeroacoustic sources using a time-reversal method.” *The Journal of the Acoustical Society of America*, 134(4), EL327-EL333.
<http://scitation.aip.org/content/asa/journal/jasa/134/4/10.1121/1.4819185> Citations: 14
13. **Mimani, A.** and Munjal, M. L. (2012). “Acoustical behavior of single inlet and multiple outlet elliptical cylindrical chamber muffler.” *Noise Control Engineering Journal*, 60(5), pp. 605-626.
<http://www.ingentaconnect.com/content/ince/ncej/2012/00000060/00000005/art00010> Citations: 13
14. **Mimani, A.** and Munjal, M. L. (2012). “On the role of higher-order evanescent modes in end-offset inlet and end-centered outlet elliptical flow-reversal chamber mufflers.” *International Journal of Acoustics and Vibration*, 17(3), pp. 139-154.
http://iiav.org/ijav/index.php?va=viewpage&vaid=177&id_number=63 Citations: 9
15. **Mimani, A.** and Munjal, M. L. (2012). “Acoustical analysis of a general network of multi-port elements - An impedance matrix approach.” *International Journal of Acoustics and Vibration*, 17(1), pp. 23-46.
http://iiav.org/ijav/index.php?va=viewpage&vaid=177&id_number=61 Citations: 19
16. **Mimani, A.** and Munjal, M. L. (2012). “3-D acoustic analysis of elliptical chamber mufflers having an end inlet and a side outlet: An impedance matrix approach.” *Wave Motion*, 49(2), pp. 71-295.
<http://www.sciencedirect.com/science/article/pii/S0165212511001375> Citations: 33
17. **Mimani, A.** and Munjal, M. L. (2011). “3-D acoustic analysis of spherical chambers having single inlet and multiple outlet: An impedance matrix approach,” *International Journal of Applied Mechanics*, 3(4), pp. 685-710.
<http://www.worldscientific.com/doi/abs/10.1142/S1758825111001196> Citations: 9

18. **Mimani, A.** and Munjal, M. L. (2011). “Transverse plane wave analysis of short elliptical chamber mufflers: An analytical approach.” *Journal of Sound and Vibration*, 330(7), pp. 1472-1489.

<http://www.sciencedirect.com/science/article/pii/S0022460X10006437>

Citations: 18

19. **Mimani, A.** and Munjal, M. L. (2010). “Transverse plane-wave analysis of short elliptical end-chamber and expansion-chamber mufflers.” *International Journal of Acoustics and Vibration*, 15(1), pp. 24-38.

http://iiav.org/ijav/index.php?va=viewpage&vaid=177&id_number=7

Citations: 15

Conference Proceedings

1. Mimani, A., Design of Semi-Circular Silencers for Two-Wheeler Applications, WESPAC 2018 at New Delhi, 11-15 November 2018.
2. Mimani, A., Kirby, R., Design of large reactive silencers for industrial applications, Internoise 2018, Chicago, USA.
3. Kirby, R., Mimani, A., “Attenuating sound in large ductwork using reactive and dissipative silencers”, NOVEM – 2018, Ibiza, Spain, 7-9 May 2018.
4. Mimani, A., Doolan, C. J. and Moreau, D. J., “Novel techniques to enhance the focal-resolution and characterization of experimental flow-induced dipole sources using time-reversal”, 23rd AIAA Aeroacoustics Conference, Denver, Colorado, USA, 5-9 June 2017. (Paper Number: 4183).
5. Mimani, A., Croaker, P., Karimi, M., Doolan, C. J. and Kessissoglou, N., “Hybrid CFD-BEM and Time-Reversal techniques applied to localise flow-induced noise sources generated by a flat-plate”, Proceedings of ACOUSTICS-2016, Brisbane, QLD, Australia, 9-11 November. (Paper Number: 83).
6. Mimani, A., “Acoustical behaviour of conical muffler with single inlet and single outlet: A 3-D semi-analytical approach”, Proceedings of ACOUSTICS-2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 29).
7. Mimani, A., “Broadband transmission loss performance of a hemispherical end-chamber muffler with single end-inlet and single/double end-outlet”, Proceedings of ACOUSTICS-2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 97).
8. Croaker, P., Mimani, A., Doolan, C. J. and Kessissoglou, N., “Localisation of flow-induced noise source generated at the aeolian tone using hybrid CFD-BEM and Time-Reversal method”, Proceedings of ACOUSTICS -2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 101).
9. Sudhakaran, R., Mimani, A., Porteous, R. and Doolan, C. J., “An experimental investigation of the flow-induced noise generated by a porous trailing-edge of an airfoil”, Proceedings of ACOUSTICS - 2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 16).
10. Sivakumar, A., Porteous, R., Mimani, A. and Doolan, C. J., “An experimental investigation of the turbulent boundary-layer interaction on different serrated trailing-edge configurations”, Proceedings of ACOUSTICS -2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 18).

11. Das, C., Mimani, A., Porteous, R. and Doolan, C. J., “An experimental investigation of the flow-induced noise mechanism of a flexible airfoil trailing-edge”, Proceedings of ACOUSTICS -2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 23).
12. Jagtap, A., Porteous, R., Mimani, A. and Doolan, C. J., “Aeroacoustic investigation of the effect of a detached flat plate on the noise from a square cylinder”, Proceedings of ACOUSTICS-2015, Hunter Valley, NSW, Australia, 17-20 November. (Paper Number: 15).
13. Mimani, A., Moreau, D. J. and Doolan, C. J. (2015) “Experimental application of aeroacoustic time-reversal”, 21st AIAA/CEAS Aeroacoustics Conference, Dallas, Texas, USA, 22-26 June 2015. (Paper Number: 3143).
14. Mimani, A., Doolan, C. J. and Medwell, P. R. (2014) “On the effect of mean flow profile, wavelength and array length on focal-resolution of a quadrupole source using aeroacoustic time-reversal”, InterNoise 2014, 43rd International Congress on Noise Control Engineering, 16-19 November, 2014, Melbourne, VIC, Australia. (Paper Number: 81).
15. Mimani, A., Doolan, C. J. and Medwell, P. R. (2014) “Aeroacoustic time-reversal in the presence of a reflecting surface” InterNoise 2014, 43rd International Congress on Noise Control Engineering, 16-19 November, 2014, Melbourne, Australia. (Paper Number: 96).
16. Mimani, A., Doolan, C. J. and Medwell, P. R. (2014). “Enhancing the Resolution Characteristics of Aeroacoustic Time-Reversal using a Point-Time-Reversal-Sponge-Layer”, 20th AIAA/CEAS Aeroacoustics Conference, Atlanta, Georgia, USA, 16-20 June. (Paper Number: 2316).
17. Prime, Z., Mimani, A., Moreau, D. J. and Doolan, C. J. (2014) “An Experimental comparison of Beamforming, Time Reversal and Near-field Acoustic Holography for Aeroacoustic Source Localization”, 20th AIAA/CEAS Aeroacoustics Conference, Atlanta, Georgia, USA, 16-20 June. (Paper Number: 2917).
18. Mimani, A., Doolan, C. J. and Medwell, P. R. (2013). “Localisation of a stationary time-harmonic dipole sound source in flows using time-reversal simulation”, Proceedings of ACOUSTICS-2013, Victor Harbor, SA, Australia, 17-20 November. (Paper Number: 13).
19. Mimani, A., Doolan, C. J. and Medwell, P. R. (2013). “Application of compact upwind biased finite difference schemes for 2-D time-reversal simulations”, 20th International Congress on Sound and Vibration, Bangkok, Thailand, 8-11 July. (Paper Number: 75).
20. Mimani, A., Doolan, C. J. and Medwell, P. R. (2013). “Compact upwind biased dispersion relation preserving finite difference schemes”, 20th International Congress on Sound and Vibration, Bangkok, Thailand, 8-11 July. (Paper Number: 74).
21. Mimani, A. and Munjal, M. L. (2013). “An analytical technique for determining end correction in a single-inlet and single-outlet flow-reversal end chamber muffler”, 20th International Congress on Sound and Vibration, Bangkok, Thailand, 8-11 July. (Paper Number: 146).
22. Mimani, A. and Munjal, M. L. (2013). “Transmission loss properties and design of reciprocal and conservative single-inlet and multiple-outlet rectangular chambers”, 20th International Congress on Sound and Vibration, Bangkok, Thailand, 8-11 July. (Paper Number: 70).
23. Mimani, A. and Munjal, M. L. (2011). “Three-dimensional acoustic analysis of an elliptical chamber muffler with a side inlet and side outlet”, 18th International Congress on Sound and Vibration, Rio de Janeiro, Brazil, 10-14 July. (Paper Number: 1939).

24. Munjal, M. L., Mimani, A. and Rao, P. S. (2009). "A novel one-dimensional analysis of short end-chamber and expansion-chamber mufflers", 16th International Congress on Sound and Vibration, Krakow, Poland, 5-9 July. (Paper Number: 129).

Oral Presentation

1. Mimani, A. and Doolan, C. J., "An overview of aeroacoustic Time-Reversal", KOZWaves 2015, presented at 2nd Australasian Conference on Wave Science, School of Mathematical Science, The University of Adelaide, 6-9 December.
2. Mimani, A., Doolan, C. J., Moreau, D. J., "On improving the localization accuracy of airfoil trailing-edge noise source using an iterative time-reversal super-resolution technique," presented during WESPAC 2018 at New Delhi 11-15 November.

Research Seminars

Seminar on *Time-Reversal as a diagnostic tool to characterise aeroacoustic/flow-induced noise sources: An overview* at

School of Manufacturing and Mechanical Engineering, University of New South Wales, Sydney, Australia, March 2015

Department of Mechanical Engineering, Indian Institute of Science, Bangalore, India, May 2015

Department of Mechanical Engineering, Indian Institute of Technology, Delhi, India, May 2015

Research and Travel Funding†

1. \$ 330,550 Gas Pipeline blowdown: Characteristics of natural gas pipeline blowdown in remote areas, RP3-11A
Cheng Lu, Xiong Liu, Ajit Godbole and Guillaume Michal (University of Wollongong),
Neil Smith, Akhilesh Mimani and Anthony Zander (The University of Adelaide)
Energy Pipelines CRC (EPCRC) Pty. Ltd., Wollongong, NSW (June 2015).

This multi-disciplinary industrial project was funded by the EPCRC Pty. Ltd., Wollongong, NSW, Australia, the project proposal was approved/funded in June 2015 and was carried out in collaboration with partners at University of Wollongong (UoW). I was the main contributor (acoustics part) to the Project proposal from the University of Adelaide which received funding worth \$ 158,100. The research funding provided me a one-year Post-Doctoral contract at level B1 (1.0 FTE) in addition to funding for local travel worth \$ 2,500 and an annual Post-Doctoral allowance worth \$ 1,500. From the University of Adelaide, I was the Project lead and responsible for the day-to-day management of the Project which includes conducting experiments, taking field trips to visit gas-venting sites across Australia, writing reports, organising meetings with the industry partners and the partners at UoW, monitoring the progress, and accounting for staff in-kind and non-staff in-kind contributions required for the project.

† All amounts mentioned are in Australian Dollars (AUD).

2. \$ 292,700 Gas Pipeline blowdown: Characteristics of natural gas pipeline blowdown in built-up (populated) areas, RP3-11B

Xiong Liu, Cheng Lu, Ajit Godbole and Guillaume Michal (University of Wollongong),
Neil Smith, Anthony Zander (The University of Adelaide)
Akhilesh Mimani (University of New South Wales)

Energy Pipelines CRC Pty. Ltd., Wollongong, NSW (October 2016).

3. Travel funding worth \$ 5000 and \$ 1000 awarded by the School of Mechanical and Manufacturing Engineering, UNSW which provided support for attending the 23rd AIAA Aeroacoustics conference at Denver, USA and ACOUSTICS 2016 conference at Brisbane, QLD.
4. Successful application for funding worth \$ 3000 and \$ 2000 by the Faculty of ECMS of the University of Adelaide, through its Overseas Conference Leave Scheme (OCLS). The funding provided a partial financial support for attending the 20th and 21st AIAA Aeroacoustics conferences, respectively, held in the USA.
5. During May 2011, I obtained a funding worth approximately Rs. 125,000 by the Department of Science and Technology, New Delhi, Government of India for attending and presenting a paper at the 18th International Congress of Sound and Vibration held at Rio de Janeiro, Brazil during 10th to 14th July 2011.

Post-graduate (Masters) Student Supervision Experience:

The University of Adelaide, February 2015 to June 2015

1. Rahul Sudhakaran
An experimental investigation of the flow-induced noise generated by a porous trailing- edge of a flat plate
2. Aravind Sivakumar
An experimental investigation of a turbulent-boundary layer interaction with different serrated trailing-edge configurations
3. Chandrashnata Das
An experimental investigation of the flow-induced noise mechanism of a flexible flat-plate trailing-edge
4. Aniket Jagtap
Aeroacoustic investigation of effect of a detached plate on wake of a square cylinder
5. Sajeev Thiyagarajah
Experimental Investigation of noise from Leading edge serrations represented as Delta wings

Teaching Experience

Advanced Topics in Aerospace Engineering (Level IV, Guest lecturer) September 2013
School of Mechanical Engineering, The University of Adelaide

Fundamentals of Noise and Vibration (Co-instructor) April-May 2017
School of Mechanical and Manufacturing Engineering, UNSW Sydney

Strength of Materials MEC 210 (Instructor) July-December 2018
School of Engineering and Applied Sciences, Ahmedabad University

ACADEMIC AWARDS AND ACHIEVEMENTS

1. Commendable Contribution to Research Quality Prize at the Centre for Energy Technology (CET), Research Day, 12th December, 2013, The University of Adelaide, South Australia – 5005, Australia.

Service to the Scientific Community: Journal Peer-Review

The Journal of the Acoustical Society of America, Journal of Sound and Vibration, Wave Motion, ASME – Journal of Vibration and Acoustics, Ultrasonics, Acoustics Australia, International Journal of Acoustics and Vibration, Applied Acoustics, Applied Mathematics and Computation, Engineering Application of Computational Fluid Mechanics, Advances in Mechanical Engineering, Archives of Acoustics, Journal of Low Frequency Noise, Vibration and Active Control, Noise Control Engineering Journal. Mechanical Systems and Signal Processing.

Conference and Book-Proposal Peer-Review

ACOUSTICS (2013, 2015) – the Annual Conferences organised by the AAS
INTERNOISE 2014, Melbourne, Australia,
Wiley, Chichester, UK

Conference Organising Committee

InterNoise 2014, 43rd International Congress on Noise Control Engineering, 16th to 19th November, Melbourne, Australia co-organized by the Australian Acoustical Society (AAS).
I have been co-chairing sessions in the AAS conferences such as Acoustics 2013 (Computational Aeroacoustics) and during Acoustics 2015 (Building Acoustics).

Professional Memberships

- Member of the International Institute of Acoustics and Vibration (IIAV)
- Member of the Acoustical Society of America (ASA).
- Member of the American Institute of Aeronautics and Astronautics (AIAA).