**Faculty and Staff Directory**

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**Title(s)**

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**Information**

**Links**

* Sharma [Research Page](http://www.aere.iastate.edu/isucaal)
* [ISU Computational Aeroacoustics Laboratory (ISU CAAL)](http://www.aere.iastate.edu/isucaal)
* [Personal Page](http://www.aere.iastate.edu/sharma)
* Sharma CV-Short
* Sharma CV
* [Google Citation](https://scholar.google.com/citations?user=7VcculEAAAAJ)

**Education**

**Ph.D**. Aerospace Engineering, The Pennsylvania State University, 2004

**M.S.** Aerospace Engineering, The Pennsylvania State University, 2001

**B. Tech.** Aerospace Engineering, Indian Institute of Technology (Bombay), 1999

**Awards and Honors**

* Associate Fellow of American Institute of Aeronautics and Astronautics (AIAA).
* US Air Force Summer Faculty Fellowship (2019 & 2016).
* NSF Early CAREER award, 2016.
* Renewable Energy Impact form Iowa Energy Center, 2014.
* Technology Project of the Year Award, General Electric Company, 2012.
* Outstanding Research Award, Vertical Flight Foundation, 2000.

**Teaching**

**Undergrad:** AerE/ME 448 Fluid Dynamics of Turbomachinery, AerE 411 Propulsion of Aerospace Vehicles, AerE 311 Aerodynamics II, EM 451 Engineering Acoustics.

**Graduate:** AerE 583X Aeroacoustics, WESEP 501X Wind Energy Resources (20%).

**Research**

**Interest Areas:**

Aeroacoustics

* Turbomachinery noise;
* Wind turbine noise;
* Bioinspired designs for noise mitigation.

Wind turbines

* Aeromechanics performance;
* Novel turbine concepts;
* Inverse design methods.

Dynamic stall

* Numerical modeling;
* Mitigation techniques.

**Selected Sponsored Projects: $1.58 M total from 12 grants including 3 federal (NSF, DOE), 5 state, 4 industry**

1. CAREER: Ultra Quiet Aircraft Propulsion Inspired by the Unique Plumage of the Owl, 04/2016 – 03/2021, NSF, $500,000.
2. Predicting Dynamic Response of Structural Cables and Power Transmission Lines in Hurricanes and Other Windstorms, with P. Sarkar (AERE), 09/2015 to 08/2019, NSF, $337,831.
3. Innovative Dual-Rotor Wind Turbine (DRWT) Designs for Improved Turbine Performance and Wind Farm Efficiency, with H. Hu (AERE), 09/2014 to 08/2018
4. CAREER: Biomimetic Designs to Silence Next-Gen Aircraft Propulsion Systems, 06/2014 to 05/2017, Iowa Space Grants Consortium, $105,000.
5. Modeling Aerodynamic Loads in Actuated Wind Turbines, 07/2013 – 12/2014, General Electric Co, $100K

**Selected Publications: (of 63 pubs. including 22 journals, 0 patents, 0 books/book chapters; h-index (Google): 12)**

1. **A. Sharma**and M. Visbal, (2019). “Numerical investigation of the effect of airfoil thickness on onset of dynamic stall,” Journal of Fluid Mechanics, Vol 870.
2. A. Bodling and **A. Sharma**, (2019). “Numerical Investigation of Noise Reduction Mechanisms in a Bio-inspired Airfoil,” Journal of Sound & Vibration, Vol. 453.
3. A. Bodling and **A. Sharma**, (2018). “Numerical investigation of low-noise airfoils inspired by the down coat of owls,” Bioinspiration and Biomimetics, Vol 14, No. 1.
4. B. Moghadassian and **A. Sharma**, (2018). “Inverse Design of Single- and Multi-Rotor Horizontal Axis Wind Turbine Blades using Computational Fluid Dynamics,” ASME J. Solar Energy Engineering, Vol. 140, No. 2.
5. B. Agrawal and **A. Sharma, (2016).** “Numerical Analysis of Aerodynamic Noise Mitigation via Leading Edge Serrations for a Rod-Airfoil Configuration,” International Journal of Aeroacoustics, Vol. 15, No. 8, pp. 734-756.
6. Z. Wang, and W. Tian, A. Ozbay, **A. Sharma**, and H. Hu, (2016). “An Experimental Study on the Aeromechanics and Wake Characteristics of a Novel Twin-Rotor Wind Turbine in a Turbulent Boundary Layer Flow,” Experiments in Fluids, Vol. 57.
7. A. Rosenberg, and **A. Sharma**, (2016). “A Prescribed-Wake Vortex Lattice Method for Preliminary Design of Co-Axial, Dual-Rotor Wind Turbines,” ASME J. Solar Energy Engineering, Vol. 138, Issue 6.
8. L. Chen, C. Harding, **A. Sharma,**and E. MacDonald, (2016). “Modeling Noise and Lease Soft Costs Improves Wind Farm Design and Cost-of-Energy Predictions,” Renewable Energy, Vol. 97, pp 849-859.
9. H. Ju, R. Mani, M. Vysohlid, and **A. Sharma**, (2015). “Investigation of Fan-Wake/Outlet-Guide-Vane Interaction Broadband Noise,” Vol. 53, No. 12, AIAA Journal, pp. 3534-3550.
10. F. Han, **A. Sharma**, U. Paliath, and C. Shieh, (2014). “Multiple Pure Tone Noise Prediction,” Vol. 233, No. 25, Journal of Sound and Vibration, pp. 6942–6959.
11. A. Rosenberg, S. Selvaraj, and **A. Sharma**, (2014). “A Novel Dual-Rotor Turbine for Increased Wind Energy Capture”, *Journal of Physics: Conference Series,*Vol. 524.
12. **A. Sharma** and Hsuannien Chen, (2013). “Prediction of Tonal Aerodynamic Noise from Open Rotors” Journal of Sound and Vibration, Vol. 332, No. 16, pp. 3832–3845.
13. **A. Sharma**, S. K. Richards, T. H. Wood, and C. M. Shieh, (2009). “Numerical Prediction of Fan Tone Interaction Noise from High Bypass Aircraft Engines,” AIAA Journal, Vol. 47, No. 12, pp. 2866-2878.
14. N. Sezer-Uzol, **A. Sharma** and L. N. Long, (2005). “Computational Fluid Dynamics Simulations of Ship Airwake,” Proceedings of the I Mech E, Part G, Journal of Aerospace Engineering, Vol. 219, No. 5, pp. 369–392.
15. **A. Sharma** and L. N. Long, (2004). “Numerical Simulation of the Blast Impact Problem using the Direct Simulation Monte (DSMC) Carlo Method,” Journal of Computational Physics, Vol. 200, No. 1, pp. 211–237.
16. F. Souliez, L. N. Long, P. J. Morris, and **A. Sharma**, (2002). “Landing Gear Aerodynamic Noise Prediction Using Unstructured Grids,” International Journal of Aeroacoustics, Vol. 1, No. 2, pp. 115–135.
17. **A. Sharma** and N. Ananthkrishnan, (2001). “Passage Through Resonance of Rolling, Finned Projectiles with Center-of-Mass Offset,” Journal of Sound and Vibration, Vol. 239, No. 1, pp. 1–17.
18. **A. Sharma** and N. Ananthkrishnan, (2000). “Large-Amplitude Limit Cycles via a Homoclinic Bifurcation Mechanism,” Journal of Sound and Vibration, Vol. 236, No. 4, pp. 725–729.