RITHIK R NAMBIAR

Ph.D. Student, Mechanical Engineering

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Website | LinkedIn | Google Scholar | ResearchGate | GitHub

SUMMARY

Ph.D. student in Mechanical Engineering at the FAMU-FSU College of Engineering, investigating shock wave–boundary layer interactions over axisymmetric geometries. Multiple peer-reviewed publications spanning computational aeroacoustics, offshore wind energy, and lighter-than-air systems, developed across leading U.S. and Indian institutions. Combines high-fidelity CFD with design optimisation to resolve high-speed and unsteady fluid-flow problems.

EDUCATION

Florida State University Aug 2026 – Present
Ph.D. in Mechanical Engineering

Iowa State University Aug 2024 – May 2026
M.S. in Aerospace Engineering (with thesis)

- *Thesis:* Modeling and Analysis of an OWC-Integrated Floating Offshore Wind Turbine Platform
  Advisor: Dr. Ossama Abdelkhalik

Manipal Institute of Technology Jul 2018 – Jul 2022
B.Tech in Aeronautical Engineering, Minor in Fundamentals of Computing

- *Thesis:* Numerical Prediction of Axisymmetric Mode Jet Screech Tones using a Finite-Volume CFD Code for Various Mach Numbers and Impinging Jets
  Advisors: Dr. Manoj T. Nair (IIST), Dr. Manikandan Murugaiah (MIT Manipal)

RESEARCH EXPERIENCE

Florida State University, Dept. of Mechanical & Aerospace Engineering
Graduate Research Assistant Aug 2026 – Present

- Investigating shock wave–boundary layer interactions (SWBLI) over axisymmetric geometries in high-speed flow.

Iowa State University, Dept. of Aerospace Engineering
Graduate Research & Teaching Assistant May 2025 – Dec 2025

- Built dynamic models and ran time-domain simulations of a Wave-Augmented Floating Offshore Wind Turbine (WAFOWT) in MATLAB/Simulink and WEC-Sim, characterising wave–body interactions and their effect on platform stability.
- Taught and assessed 30+ students in AERE 3220: Aerospace Structures Laboratory, leading hands-on structural testing experiments.

Computational Aerodynamics & Aeroacoustics Laboratory, Iowa State University
Research Assistant Sept 2024 – Jan 2025

- Designed an ultrasonic bat deterrent based on aerodynamic whistles to reduce wildlife mortality at commercial wind farms.
- Conducted CFD and CAA simulations to identify the device's governing operational principles, informing subsequent design revisions.
- Applied Multidisciplinary Design Optimization (MDO) through a discrete adjoint formulation in OpenFOAM (DAFoam) to improve acoustic output.

Indian Institute of Technology Bombay, LTA Systems Laboratory, India
Project Research Assistant Sept 2022 – Jun 2024

- Led a feasibility study on solar/wind aerostats for transmission towers, identifying deployment strategies projected to reduce operational costs by 20%.
- Improved power generation efficiency by 15% over the baseline configuration through CFD analysis of horizontal- and vertical-axis wind turbines.
- Developed a custom design dashboard that reduced aerostat sizing cycle times by 60%.
- Teaching Assistant for AE664: Lighter-Than-Air Systems; mentored interns and undergraduate project students.

Indian Institute of Space Science and Technology, Trivandrum, India
Research Intern Jan 2022 – Jul 2022

- Modelled screech tones in supersonic jets using ANSYS Fluent, quantifying the effect of Mach number on noise generation.
- Analysed sound pressure levels across multiple microphone locations to characterise far-field acoustic behaviour.

PUBLICATIONS

J — Journal article • C — Conference proceeding

2026

[J3] **Nambiar, R. R.**, and Abdelkhalik, O. "Hydro-Pneumatic Modeling of an OWC-Integrated Floating Offshore Wind Platform" *IEEE Journal of Oceanic Engineering 2026. (In review)*

[C5] **Nambiar, R. R.**, and Abdelkhalik, O. 'Reducing Mass of Floating Offshore Wind Turbines: Leveraging Wave Power for Motion Stabilization" *OCEANS 2026. (accepted)*

2025

[J2] **Nambiar, R. R.**, Karthik, S. K., Manikandan, M., Singh, B., and Nair, M. T. "Numerical Prediction of Axisymmetric Jet Screech Tones in Supersonic Flows." *CFD Letters*, 18(4), 34–53. doi:10.37934/cfdl.18.4.3453

2024

[J1] **Nambiar, R. R.**, Dixit, M., and Pant, R. S. "Conceptual Sizing Approach for Electric Power Generation Turbine Aerostat." *Journal of Aerospace Sciences and Technologies*, 76(2), 67–80. doi:10.61653/joast.v76i2.2024.962

2023

[C4] **Nambiar, R. R.**, Tripathi, M., and Pant, R. S. "Effect of Horizontal and Vertical Overlap on the Performance of a Two-Bladed Vertical Axis Wind Turbine." *AIAA AVIATION 2023 Forum*, San Diego, CA. doi:10.2514/6.2023-4118

[C3] **Nambiar, R. R.**, Dixit, M., and Pant, R. S. "Methodology for Conceptual Sizing of a Turbine Aerostat for Electrical Power Generation." *AIAA AVIATION 2023 Forum*, San Diego, CA. doi:10.2514/6.2023-3792

[C2] **Nambiar, R. R.**, Karthik, S. K., Manikandan, M., and Nair, M. T. "Numerical Prediction of Generation of Axisymmetric Mode Jet Screech Tones at Different Mach Numbers." *AIAA AVIATION 2023 Forum*, San Diego, CA. doi:10.2514/6.2023-4389

[C1] **Nambiar, R. R.**, and Gupta, P. "Conceptual Design of a Solar Powered Winged Hybrid Airship for Agricultural Purposes." *AIAA AVIATION 2023 Forum*, San Diego, CA. doi:10.2514/6.2023-3791

HONORS & AWARDS

Global Scholars Award — Graduate, International Students & Scholars Office, Iowa State University 2026

TECHNICAL SKILLS

Numerical Analysis	ANSYS Fluent, ANSYS Mechanical APDL, OpenFOAM (incl. DAFoam discrete adjoint), CFD++, MIME, WEC-Sim
Programming	Python (NumPy, SciPy, Matplotlib), MATLAB/Simulink, Bash
Computing	Linux, Git, HPC cluster workflows, parallel job scheduling
Post-Processing	ParaView, Tecplot
CAD & Design	CATIA V5, Autodesk Fusion 360, AutoCAD
Documentation	LaTeX, Microsoft Office Suite, Google Workspace

SERVICE, OUTREACH & LEADERSHIP

Organiser — National Seminar on Emerging Technologies in Aerospace Engineering (eTAE 2023), IIT Bombay May 2023

- Coordinated a national programme attended by delegates from government agencies and private industry.

Outreach Lead — LTA Systems Laboratory, IIT Bombay 2022 – 2024

- Ran laboratory outreach programmes and mentored visiting interns.

LANGUAGES

Fluent: English, Hindi, Malayalam.