Dr. J. P. Panda, Ph.D.(IITKGP)

Contact Information

Mechanical and Materials Engg. Dept.
University of Cincinnati, Cincinnati
Ohio, USA

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Current Position

Post-Doctoral Fellow
Department of Mechanical and Materials Engineering
University of Cincinnati, USA
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Current research

Experimental and data driven modeling of acoustic sensing in flow condensation

Research Interests

Turbulent Flows, Data-driven Modeling, Scientific Machine Learning, Non-Equilibrium Fluid Dynamics, Micro-Nano thermo-mechanics, Computational Thermo-Fluid Mechanics

Experience

University of Cincinnati, USA May 2025 to Present
Post-Doctoral Research Fellow
Funding Agency: National Aeronautics and Space Administration (NASA), USA

University of Notre Dame, USA Oct 2023 to May 2025
Post-Doctoral Research Associate
Funding Agency: Defense Advanced Research Projects Agency (DARPA), USA

Gyeongsang National University, South Korea Aug 2022 to Sep 2023
Senior Researcher
Funding Agency: NRF-South Korea, AOARD-AFSOR-USA

Indian Institute of Technology Kharagpur, India Mar 2019 to June 2021
Research Associate
Funding Agency: NRB, Defense Research and Development Organisation, India

Education

Indian Institute of Technology Kharagpur, Kharagpur, WB, India

Ph.D., Ocean Engineering and Naval Architecture, Aug 2019

- Specialization: Computational Fluid Dynamics (Turbulence Modeling)
- Thesis Topic: *Pressure Strain Correlation Modeling for Turbulent Flows*

Indian Institute of Engineering Science and Technology, Shibpur, WB, India

M.E., Mechanics of Fluids (Microfluidics), June 2015

- Department: Aerospace Engineering and Applied Mechanics
- Thesis Topic: *Electroosmotic Mixing and Joule Heating in Microchannels*

National Institute of Electronics and Information Technology, India

P.G. (Post Graduate), Data Engineering, Online Course, Nov 2023

- Configuring Linux Platform for Data Engineering
- Data Analytics and Machine Learning using Tensorflow and Keras
- Big Data Analytics with Hadoop and Apache Spark

Biju Patnaik University of Technology, Rourkela, ODISHA, India

B.Tech., Mechanical Engineering, June 2012

- Project: *Design and fabrication of a pneumatic material handling system*
- *CGPA 8/10*

SCI Journal Publications

1. **Panda, J.**, Warrior, H.,"A representation theory based model for the rapid pressure strain correlation of turbulence"2018, *ASME Journal of Fluids Engg.*, Vol. 140 / 081101-1. (Impact Factor: 1.995) (Q2 Mechanical Engineering)

2. Shang, W, Jhou, J,**Panda, J.**,Wang, J , Luo, T,,"JAX-BTE: a GPU-accelerated differentiable solver for phonon Boltzmann transport equations. npj Computational Materials, 11(1), pp.1-12.(Q1 Computer Science Applications)

3. **Panda, J.**, Warrior, H.,"Modeling pressure strain correlation for turbulent flows using deep neural networks" 2021, *Proceedings of the Institution of mechanical engineers, Part C: Journal of Mechanical Engg. Science.* (Impact Factor: 1.762). (Q2 Mechanical Engineering)

4. **Panda, J.**, Warrior, H.,"Data-driven prediction of complex flow field over an axisymmetric body of revolution using Machine Learning" 2022, *ASME Journal of Offshore Mechanics and Arctic Engineering.* (Impact Factor: 1.355) (Q2 Energy)

5. **Panda, J.**, Warrior, H.,"Evaluation of machine learning algorithms for predictive Reynolds stress transport modeling" 2021, *Acta Mechanica Sinica* , (Impact Factor: 1.975) (Q2 Computational Mechanics)

6. **Panda, J.**, Kumar, B., Kumar, A.,Patil, A.,"Influence of twisted tape length on the thermal performance of a heat exchanger tube" 2022, *Numerical Heat Transfer, Part A: Applications*, (Impact Factor: 2.928) (Q2 Condensed matter physics)

7. **Panda, J.**, Kumar, B., Patil A., Kumar M. "Machine learning assisted modelling of thermohydraullic correlations for heat exchangers with twisted tape inserts, 2023, *Acta Mechanica Sinica* (Accepted), (Impact Factor: 1.975) (Q2 Computational Mechanics)

8. **Panda, J.**, Warrior, H.,"Numerical studies on drag reduction of an axisymmetric body of revolution with antiturbulence surface" 2021, *ASME Journal of Offshore Mechanics and Arctic Engineering*, 143(6), p.064501. (Impact Factor: 1.355) (Q2 Energy)

9. **Panda, J.**, Warrior, H., Maity, S., Mitra, A.,Sasmal, K.,"An improved model including length scale anisotropy for the pressure strain correlation of turbulence" 2017, *ASME Journal of Fluids Engineering*, Vol. 139 / 044503-1. (Impact Factor: 1.995) (Q2 Mechanical Engineering)

10. **Panda, J.**,"A review of pressure strain correlation modeling for Reynolds stress models " 2019, *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science.* DOI:https://doi.org/10.1177/0954406219893397. (Impact Factor: 1.762) (Q2 Mechanical Engineering)

11. **Panda, J.**, Mitra, A., Warrior, H.,"A review on the hydrodynamic characteristics of autonomous underwater vehicles"2020. *Proceedings of the Institution of Mechanical Engineers, Part M: Journal of Engineering for the Maritime Environment, DOI: https://doi.org/10.1177/1475090220936896.* (Impact Factor: 1.389) (Q2 Mechanical Engineering)

12. **Panda, J.**,"A reliable pressure strain correlation model for complex turbulent flows" 2020. *Journal of applied fluid mechanics, Vol. 13, No. 4, pp. 1167-1178.* (Impact Factor: 1.783) (Q3 Condensed matter physics)

13. Mitra, A. **Panda, J.**, Warrior, H.,"The effects of free stream turbulence on the hydrodynamic characteristics of an AUV hull form" 2019. *Ocean Engineering, Vol. 174 (2) / 148-158.* (Impact Factor: 3.795) (Q1 Environmental engineering)

14. Mitra, A., **Panda, J.**, Warrior, H.,"Experimental and numerical investigation of the hydrodynamic characteristics of Autonomous Underwater Vehicles over seabeds with complex topography"2020. *Ocean Engineering,Volume 198, 106978* . (Impact Factor: 3.795) (Q1 Environmental engineering)

15. **Panda, J.**, Sasmal, K., Maity, S., Warrior, H.,"A Simple Nonlinear Eddy Viscosity Model for Geophysical Turbulent Flows" 2020, *Journal of Applied Fluid Mechanics*, 14(3). (Impact Factor: 1.783) (Q3 Condensed matter physics)

16. Das A., Das, SR., **Panda, J.**, Dey A.,Gajrani KK., Somani N., Gupta N. "Machine learning based modelling and optimization in hard turning of AISI D6 steel with advanced AlTiSiN coated carbide inserts, 2022, *Surface Review and Letters.* (Impact Factor: 1.303) (Q3 Materials chemistry)

17. Somani, N., Walia, A., Gupta, N., **Panda, J.**, Das, A., Das S."Data driven surrogate model-based optimization of the process parameters in electric discharge machining of D2 steel using Cu-SiC composite tool" 2023, *Revista de Metalurgia.* (Impact Factor: 0.8) (Q3 Metals and Alloys)

18. **Panda, J.**, Mitra, A., Joshi, A., Warrior, H.,"Experimental and numerical analysis of grid generated turbulence with and without mean strain" 2018, *Experimental Thermal and Fluid Science, Vol. 98 (11) / 594-603.* (Impact Factor: 3.232) (Q1 Aerospace engineering)

19. **Panda, J.**, Handique J., Warrior, H.,"Mechanics of drag reduction of an axisymm etric body of revolution with shallow dimples" 2022, *Proceedings of the iMech, Part M: Journal of Engineering for Maritime Envionment.* (Impact Factor: 1.389) (Q2 Mechanical Engineering)

20. **Panda, J.**"Machine learning for Naval Architecture Ocean and Marine Engineer ing" 2023, *Journal of Marine Science and Technology.* (Impact Factor: 2.005) (Q1 Mechanical Engineering)

21. Mitra, A.,**Panda, J.**, Warrior, H.,"The hydrodynamic characteristics of autonomous underwater vehicles in rotating flow fields" 2023, *Proceedings of the iMech, Part M: Journal of Engineering for Maritime Envionment* (Q2 Mechanical Enginee ring).

Submitted Journal Publications

1. Jhou, J, Shang, W,**Panda, J.**,..,Wang, J , Luo, T,,"Physics-informed neural networks with hard-encoded angular-dependent boundary conditions for phonon Boltzmann transport equation, International Journal of Heat and Mass Transfer (2025) (submitted).

International Conference Publications

1. **Panda, J.**,..,Wang, J , Luo, T,"Scalable Thermal Analysis of Field-Effect Transistors Using Neural Operators" 2025. *18th U.S. National congress on computational mechanics,Chicago, Illinois, July 20-24, 2025.*

2. **Panda, J.**,..,Wang, J , Luo, T,"Data-Driven Prediction of Thermal Field in Field-Effect Transistors Using Deep Neural Networks" 2024. *ASME 2024 Heat Transfer Summer Conference (SHTC2024).*

3. Zhou J, **Panda, J.**,..,Wang, J , Luo, T," Jax-Bte: A Differentiable Hybrid Neural Solver for Deep Learning Accelerated Thermal Modeling of Nanoelectronics " 2024. *ASME 2024 Heat Transfer Summer Conference (SHTC2024).*

4. Shang W, **Panda, J.**,..,Wang, J , Luo, T,"Physics-Integrated Hybrid Machine Learning Model for Phonon Bte " 2024. *ASME 2024 Heat Transfer Summer Conference (SHTC2024)* .

5. Zhou J, **Panda, J.**,..,Wang, J , Luo, T," Physics-Informed Neural Networks for Transistor Thermal Modeling Using Phonon Boltzmann Transport Equation " 2024. *ASME 2024 Heat Transfer Summer Conference (SHTC2024).*

6. J Zhou, R Li, W Shang, B Zhang, Z Xu, **Panda, J.**, J Wang, T Luo, T Beechem, E Walker,"Efficient Physics-Informed Deep Learning Model for Multiscale Thermal Analysis" 2024. *Government Microcircuit Applications and Critical Technology (GOMACTech) Conference.*

7. **Panda, J.**, Myong, R. S.,"Subgrid Modeling for Large Eddy Simulation of Shock Boundary Layer Interaction Using Machine Learning" 2023. *The 14th Asian Computational Fluid Dynamics Conference, CSIR, National Aerospace Laboratories, Bengaluru, India.*

8. **Panda, J.**, Sengupta, B., Myong, R. S.,"Direct numerical simulation of shock turbulence interaction with bulk viscosity effects" 2023. *The 34th International Symposium on Shock Waves, Daegu, Korea.*

9. **Panda, J.**, Gupta, S., Pal, D.,"Computational Analysis of Liquid-Liquid Mixing In a T-Shaped Serially Connected Converging-Diverging microchannel" 2014. *59th Congress of ISTAM, IIT Kharagpur, India.*

10. Mohapatra, P., **Panda, J.**, Pal, D.,"Electro-osmotic Flow and Mixing in a Microchannel: A Numerical Study" 2014. *59th Congress of ISTAM, IIT Kharagpur, India.*

11. **Panda, J.**, Warrior, H., Maity, S.,"Pressure Strain Correlation for decaying homogeneous turbulence" 2016. *Fluid Mechanics and Fluid Power Conference held at MNNIT Allahabad, India.*

12. Joshi, A., Warrior, H.,**Panda, J.**"An Improved Single Point Closure Model Based on Dissipation Anisotropy for Geophysical Turbulent Flows" 2018. *Int. Conference on Oceanography held at Miami, USA.*

13. Gupta, S.,**Panda, J.**, Nandi, N."A Model Study of Free Vortex Flow" 2014. *ICTACEM Conference held at IIT Kharagpur, India.*

Teaching Experience

Dehradun Institute of Technology (DIT), University, India 2021 to 2022
Assistant Professor

Scholarships

- MHRD government of India fellowship for doctoral studies , India 2015-2018
- MHRD government of India fellowship for PG studies , India 2013-2015

Programming and Software Skills

Programming:
Python, C/C++

Software/Codes:
Docker and Singularity container
ANACONDA (For python environments)
JAX-Fluids (DNS and LES) (Parallel CUDA, Python)
STREAMS (DNS) (Parallel MPI/CUDA, FORTRAN)
GiftBTE (Boltzmann transport equation) (submicron thermal transport)
OpenFOAM (RANS, LES, DSMC) (Parallel MPI, C++)
SU2 (Parallel MPI, C++)
ANSYS Fluent (RANS and RSTM)
Gmsh/Ansys-workbench/Gambit (Meshing)

SPARTA and Prof. Bird's code (DSMC)
TensorFlow and Keras (Deep learning)
TensorFlowFoam(Linking neural network models with OpenFoam)
Scikit Learn (Machine Learning), MATLAB

Experimental work

Instrument: Acoustic Doppler Velocimeter
Principle of operation: Doppler Shift
Measured parameters: Three fluctuating turbulent velocity components in grid generated turbulence with and without mean strain
Location: Recirculating water tank, Ship Hydrodynamics Lab, IIT Kharagpur

Professional Profiles

Google Scholar Profile: Citation: 495, h-index: 11, i10-index: 14

Researchgate Profile, Linkedin Profile

Guest Editor

Springer: Discover Fluid Mechanics
Journal of Marine Science and Engineering
Frontiers in Mechanical Engineering

Reviewer

Physics of Fluids, ASME Journal of heat and mass transfer, , International Journal of Mechanical Sciences , Thermal Science and Engineering Progress , International Journal of Thermofluids , Proceeding of the IMECH part C: Journal of Mechanical Engineering and Science,Thermal Science, Ocean Engineering, International Journal of Fluid Mechanics Research, Industrial Robot

References

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Personal Profile	NAME: Jyoti Prakash Panda
	NATIONALITY: Indian