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

Contact Information	Aerospace and Mechanical Engg. Dept. University of Notre Dame, South Bend Indiana, USA	Phone: Email: Homepage:	+91-9439701768 jppanda.iit@gmail.com https://dr-jppanda.github.io

Current Position

Post-Doctoral Research Associate
Computational Mechanics and Scientific Artificial Intelligence Lab
Department of Aerospace and Mechanical Engineering
University of Notre Dame, USA
+1-(551) 260-1943, jpanda@nd.edu

Current research

Thermal management of intel micro-chip, Nano-transistor heat transfer modeling

Research Interests

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

Experience

University of Notre Dame, USA Oct 2023 to Present
Post-Doctoral Research Associate
Funding Agency: Defense Advanced Research Projects Agency (DARPA), USA
Role: Data driven heat transfer modeling in nano-transistors using physics informed neural networks

Gyeongsang National University, South Korea Aug 2022 to Sep 2023
Post-Doctoral Research Fellow
Funding Agency: NRF-South Korea, 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., Computational Fluid Dynamics (Turbulence Modeling), Aug 2019

- Thesis Topic: *Pressure Strain Correlation Modeling for Turbulent Flows*

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. **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)
3. **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)
4. **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)

5. **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)

6. **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)

7. **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)

8. **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)

9. **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)

10. **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)

11. **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)

12. 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)

13. 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)

14. **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)

15. **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)

16. **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)

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

18. **Panda, J.**"The hydrodynamic characteristics of autonomous underwater vehicles in rotating flow fields" 2023, *Proceedings of the iMech, Part M: Journal of Engineering for Maritime Envionment.* (Impact Factor: 1.389) (Q2 Mechanical Engineering)

International Conference Publications

1. **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* (Accepted).

2. **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.*

3. **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.*

4. 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.*

5. **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.*

6. 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.*

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

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

Reviewer

Physics of Fluids
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

Prof. Tengfei Luo (Postdoc advisor)
Professor — Phone: +1-574-631-9683
Department of Aerospace and Mechanical Engg. — E-mail: tluo@nd.edu
University of Notre Dame, USA

Prof. Jian-Xun Wang (Postdoc advisor)
Assistant Professor — Phone: +1-574-631-5302
Department of Aerospace and Mechanical Engg. — E-mail: jwang33@nd.edu
University of Notre Dame, USA

Prof. R. S. Myong (Postdoc advisor)
Professor — Phone: +82-55-772-1645
School of Mechanical and Aerospace Engg. — E-mail: myong@gnu.ac.kr
Gyeongsang National University, South Korea

Prof. Hari V. Warrior (Phd advisor)
Professor — Phone: +91-3222-283778
OENA Department — E-mail: warrior@naval.iitkgp.ac.in
IIT Kharagpur, India

Prof. Debashis Pal (Master's advisor)
Assistant Professor — Phone: +91-33- 26684561
AEAM Department — E-mail: debashis@aero.iiests.ac.in
IIEST, Shibpur, India

Personal Profile

NAME: Jyoti Prakash Panda

NATIONALITY: Indian

PERMANENT ADDRESS: Sergarh, Balasore, Odisha, 756060, India