Rajkamal Sah

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Objective

Aspiring to contribute as an **Assistant Professor** in Aerospace/Mechanical Engineering by combining my expertise in **aerodynamics, experimental fluid dynamics (PIV, Schlieren, Oil Flow), and computational modeling (CFD, LES)** with a strong passion for teaching, mentoring, and guiding students towards academic and research excellence.

Education

- **Indian Institute of Science (IISc)** — *2019 – Present*
  Ph.D., Aerospace Engineering — Bangalore, India
- **Indian Institute of Technology (IIT)** — *2017 – 2019*
  M.Tech., Mechanical Engineering — Kharagpur, India
- **National Institute of Technology (NIT)** — *2013 – 2017*
  B.Tech., Mechanical Engineering — Manipur, India
- **Jawahar Navodaya Vidyalaya** — *2012*
  Intermediate in Science — Purnia, Bihar

Research Contributions

- **Experimental Aerodynamics of Spinning Bodies:** Conducted wind-tunnel experiments with Schlieren, oil-flow visualization, and planar/stereoscopic PIV on rotating cones and cone–cylinder models.
- **Computational Fluid Dynamics (CFD):** Performed transient simulations in ANSYS Fluent and ICEM-CFD to analyze boundary layers, instabilities, and structural coupling.
- **Data-driven Flow Analysis:** Applied POD and SPOD to PIV datasets to identify coherent structures and frequency-resolved dynamics.
- **High-speed Rotating Facility Development:** Designed and commissioned a custom test rig achieving up to **10,000 rpm** with **phase-locked** acquisition for PIV/Schlieren; implemented BLDC motor drive, precision bearings and dynamic balancing, safety interlocks, and remote operation.
- **Instrumentation & Synchronization:** Built an **IR-based optical encoder** for real-time phase tracking and synchronized laser/camera triggering to encoder ticks for repeatable phase-resolved measurements (Python/Arduino/DSP).
- **Multidisciplinary Extensions:** FEM–CFD coupled simulations, CAD design of aerodynamic models, and applications of ML/LLMs for flow data analysis.

Publications

J=Journal, C=Conference

[**J.1**] Sah, Rajkamal, Sumit Sunil Tambe, and Jagadeesh Gopalan.**Experimental investigation of lift-up and instability of the viscous flow induced by a rotating cone-cylinder in an enclosure**. In *physics.flu-dy*, May 29, 2025, DOI:10.1063/5.0273987

[**C.1**] Your Name, et al. (2023). **Unsteady Numerical Studies on Spinning Cone at Different Flow Regimes**. *ISSW34*, Springer Nature.

[**C.2**] Your Name, et al. (2021). **Numerical Studies on the Aerodynamics of a High-Speed Spinning Projectile**. *24th International Shock Interaction Symposium*, Springer.

Teaching Experience

- **Indian Institute of Science (IISc)** — *Aug 2021 – Dec 2021*
  Teaching Assistant – Gas Dynamics — Bangalore, India
  – Conducted tutorials, lab demonstrations, and evaluated assignments for postgraduate students.
  – Delivered supplementary lectures on compressible flow theory and experimental methods.
  – Mentored student projects and supported academic counseling.
- **Ramaiah Polytechnic** — *July 2016 – June 2017*
  Lecturer – Mechanical Engineering — Bangalore, India
  – Taught core courses: Fluid Mechanics, Thermodynamics, and Gas Dynamics.
  – Supervised laboratory courses and student design projects.
  – Acted as faculty mentor for student development programs.

Skills

- **Experimental Techniques:** PIV (Planar Stereo), Schlieren Imaging, Oil Flow Visualization, IR Thermography.
- **Computational Tools:** ANSYS Fluent, ICEM-CFD, CATIA V5, FEM–CFD Coupling, Design of Experiments.
- **Programming & Data Analysis:** Python (NumPy, Pandas, Matplotlib, OpenCV, SciPy), MATLAB, TensorFlow, Scikit-learn, Signal Processing.
- **Teaching Tools:** Course design, Lab supervision, Student mentoring, Academic counseling.
- **Professional Competencies:** Research writing, Conference presentations, Scientific visualization, MySQL/Excel for data handling.

Honors and Awards

- **Prime Minister's Research Fellowship (PMRF)** *2019 – 2024*
  Fellowship Awardee India
- **JNV Entrance, Navodaya Vidyalaya Samiti** *2006 – 2012*
  Merit-based admission India

References

1. **Prof. Gopalan Jagadeesh**
   Professor, Department of Aerospace Engineering, IISc Bangalore
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   Thesis Supervisor
2. **Prof. Sumit Sunil Tambe**
   Assistant Prof., IIT Madras
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   Research Collaborator / Mentor