

Aaditya Chandel

Ph.D. (pursuing) Mechanical Engineering

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Education

- 2015–till date **Ph.D.**,
, Indian Institute of Technology Madras, Chennai.
Mechanical Engineering, *CGPA – 7.60/10*
- 2012–2014 **Master of Technology**,
, National Institute of Technology, Silchar, Assam.
Mechanical Engineering, *CGPA – 7.71/10*
- 2006–2010 **Bachelor of Technology**,
, University Institute of Engineering and Technology, Kanpur, Uttar Pradesh.
Mechanical Engineering, *CGPA – 7.56/10*

B.Tech (Mechanical)

- Title Power generation through Speed Breakers.
- Description Heat transfer between substances in porous medium has become significant in recent years. The basic concept behind the use of porous fins is to increase the effective surface area from which the heat is convected to the ambient fluid. The use of porous fins is an excellent passive method for providing high heat transfer rates for electronic components in a compact, lightweight, low maintenance and energy-free package. Therefore, since porous media play a vital role in thermal systems, it follows that they should be efficient in all forms of thermal systems and have no fault. It has been found that the use of porous fin with a optimal porosity parameter can achieve the same output as traditional fin. The use of lesser material make the fins light weight and cost-effective

Master Thesis

- Title *Heat Transfer Enhancement Using Porous Fins*
- Supervisor Dr. Dipankar Bhanja
- Description For decades, heat transfer through the extended surface has been studied. Many research activities have already been devoted to calculate the rate of heat transfer and fin performance parameters in conventional solid fins. The drawback of using solid fins are extra material uses, cost and weight. The use of porous fins is an excellent passive method for providing high heat transfer rates for electronic components in a compact, lightweight, low maintenance and energy-free package. Therefore, since porous material play a vital role in thermal systems, it follows that they should be efficient in all forms of thermal systems and have no fault. It has been found that the use of porous fin with a optimal porosity parameter can achieve the same output as traditional fin. The thesis is based on enhancing the heat transfer by extended surface by using the porous fins. The effect of various geometric and thermophysical parameters on the dimensionless temperature distribution and fin efficiency are studied that may help in optimum design analysis of a porous fin. The formulated heat transfer equation is solved by using to the Adomian decomposition and Variational iteration analytical technique. After the study it is found that porous fin provides much better efficiency than solid fin when heat generation and other thermo-physical parameter varies. On the other hand, without considering heat generation solid fin has higher fin efficiency than that of porous fin.

Research Experience

Regular

- Jan 2015–Till Date **Research Scholar**, *Dept. of Mechanical Engineering*, IIT Madras, Chennai, India.
Effects of rotation and translation on the flow past a sphere and the wall proximity effects in quiescent flow environment.
Dissertation committee: Dr. Shyama Prasad Das (advisor), Dr. Shaligram Tiwari, Dr. Ashis Kumar Sen,
- Achievements:
- A cost effective and simple experimental setup by using limited number of resources is used for the experimental analysis. The advanced optical, noninvasive experimental technique (Particle Image Velocimetry (PIV) and Planar Laser Induced Fluorescence (PLIF)), is used for obtaining the flow features.
 - The flow regimes at different ranges of Reynolds were characterized. The bifurcation from the laminar to turbulent is defined for the trans-rotating sphere.
 - The wall proximity effects which are important for particle-laden flows, sedimentation, sports aerodynamics and other engineering and science applications are studied at different rotational rates for flow past a sphere.
- Jan 2015–Dec 2019 **Half Time Research Associate**, *Dept. of Mechanical Engineering*, IIT Madras, Chennai, India.
Departmental as well as administrative duty.
Tasks:
- Conducted Thermal Engg. lab for undergrad students where I supervised the flow experiments.
 - Performed invigilation duty during semester exams.
 - Scrutinized applications of the candidates applying for M.S. and Ph.D. programme in IIT Madras.

Skills

Software	MATLAB, Pro-e, ANSYS-Fluent, OriginLab, ImageJ, MS Office
Experimental techniques	Optical Connectivity, Shadowgraphic visualization, high-speed imaging, PIV, PLIF, LDV

Journal Publications

1. A.Chandel and S.P.Das, "Effect of wall proximity on the wake of a rotating and translating sphere," **Acta Mech (Submitted, Under Review, 2021)**
2. A.Chandel and S.P.Das, "Wake of transversely rotating and translating sphere in quiescent water at low Reynolds number," **Acta Mech (2021)**
3. A.Chandel and S.P.Das, "Effects of rotational rate on flow past a trans-rotating sphere at moderate to high Re number Range," **Manuscript ready to submit**

Conferences

1. A.Chandel, S.P.Das, "Effect of Reynolds number in transversely rotating and translating sphere" **APS Division of Fluid Dynamics, Georgia (USA), 2018**
2. A.Chandel, S.P.Das, "Effect of rotation on flow past a rotating and translating sphere" **International Conference on Fluid Mechanics and Fluid Power, Mumbai, 2018**
3. A.Chandel, S.P.Das, "Wake of rotating and translating sphere at low Reynolds number," 21st **Australasian Fluid Mechanics Conference**, Adelaide, Australia, December-2018

Experience

- Working as a Project Officer in DRDO project on "Loss reduction in annular S-shaped ducts". [October-2020 to Jan,2021]

- Working as a Project Officer in ISRO project on “Heat and Mass Transfer Across Liquid-vapor Interface in a Pressurized Cryogenic Tank with and without Sloshing”. [April-2020 to September-2020]
- Work as Assistant Professor at Parul University, Vadodara(GJ). [June, 2014–Dec, 2014]
- Coordinator for Short term course on “Emerging Trends in Product Developments” at Parul University, Vadodara(GJ). [10/Nov/2014–14/Nov/2014]

Extra Academic Activities

Assistant Warden	Work as Assistant warden for Narmada Hostel, IIT Madras. [April 2020 to August 2020]
Student Legislator	Held the position of Student Legislator at Students Legislative Council, IIT Madras. The work is to amend the students rights and making students new policies. [June 2017 to May 2018]
General Secretary	Held the position of General Secretary at Pampa Hostel, IIT Madras. The work is to manage and incorporate new facilities to 450 hostel resident. [June 2016 to May 2017]
Mess Monitoring Committee	Work for mess monitoring committee under CCW, IIT Madras. [June 2016 to May 2017]

Extra Curricular

Incubation Cell IIT Madras	Working as member of Nirmaan pre-incubation cell at IIT Madras
General Secretary	Elected as General Secretary of Pampa Hostel(16-17), IIT Madras. The role and responsibilities includes handling of facilities for nearly 400 students in the hostel.
Hostel Legislator	Elected as Hostel Legislator of Pampa Hostel(17-18), IIT Madras. The position and duties include amending and developing new policy to ensure the welfare of students.
Logo Design Competition	1 st position in Hostel Official Logo Design Competition at Pampa Hostel, IIT Madras.
Workshop	Conducted Ideas Challenge workshop for Departmental event Mechanica-21, IIT Madras
Chennai Marathon	Runner of Chennai Marathon for 2 year
Cycling Club	Member of cycling club at IIT Madras, Peddle for multiple cycling event organised for nobel cause.

Achievements/Awards

1. Recipient of MHRD (Govt. of India) scholarship for continuing post-graduate studies in NIT Silchar (2012).
2. Recipient of MHRD (Govt. of India) scholarship for continuing Ph.D in IIT Madras (2015).

Declaration

I hereby declare that the above mentioned information is correct up to my knowledge and I bear the responsibility for the correctness of the above mentioned particular.

Date: June 5, 2021

Place: IIT Madras, Chennai, India

Aaditya Chandel