Chitransh Atre

RESEARCHER · CFD EXPERT

IIT Madras

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Personal Profile

As a passionate researcher specializing in Computational Fluid Dynamics (CFD) and microchannel flow experiments, I find immense joy in exploring the intricacies of fluid dynamics. My expertise in this field is extensive, and I am proficient in using various pre-processing software tools. Currently, I am working on an exciting IMPRINT project funded by DST in collaboration with DRDO, IISc Bangalore, and A.S.L. Pvt. Ltd. (Hyderabad). I am thrilled to be a part of this initiative that aims to tackle some of the most pressing technical challenges in our country.

Education

Indian Institite of Technology Madras, IIT Madras   *Chennai, India*

Doctor of Philosophy, Ph.D.   *August 2019 - Current*

- Fluid division, Department of Applied Mechanics
- Worked as a TA for 4 courses
- **Courses:** Fluid Mechanics, Computational Fluid Dynamics (CFD), OpenFOAM programming, Experimental fluid mechanics, Image Processing, Machine Learning

Indian Institute of Technology Kharagpur, IIT KGP   *Kharagpur, India*

Masters of Technology, M.Tech   *May 2017 - May 2019*

- Graduated with Distinction
- Atmospheric Sciences

National Institute of Technology Bhopal, MANIT Bhopal   *Bhopal, India*

Bachelor's of Technology, B.Tech.   *August 2012 - May 2016*

- Graduated with Distinction
- Mechanical Engineering

Jawahar Navodaya Vidyalaya, JNV   *Khargone, India*

High School   *Apr 2009 - Apr 2011*

- Passed with Distinction
- Specialised in Physics, Chemistry, and Maths with Computer Science

Work Experience

Industrial Consultancy and Sponsored Research, IIT Madras   *Chennai, India*

Project Officer   *Aug 2019 - Present*

- Collaborated with a three-person team to develop The project is to design and fabricate a flat heat pipe for electronic cooling of the radar communication microwave chip being used in AGNI missiles. The project is in collaboration with IISc Bangalore, ASL-DRDO Hyderabad, Astra Microwave Pvt Ltd Hyderabad and Dept of Metallurgy and Materials Science, IIT M and Applied Mechanics, IITM.
- **Technical Skills:** Image Analysis and Image Processing using MATLAB, Experiments, Numerical and CFD Simulations using OpenFOAM.
- **Soft Skills:** Teamwork, Time Management, Communication, Presentation skills.

Leibniz Universitat Hannover, Germany   *Hannover, Germany*

Research fellow   *Sept 2018- July 2019*

- Worked on the IDL programming and simulating the solar exposure for various surfaces like concrete, grass, sand and by measuring the albedo of these surfaces, calculating the UV exposure on humans. It helps in the evaluating the vitamin-D content in the human body and helps human to understand the time for getting the sufficient vitamin-D. Also, the change in UV exposure is measured for different clouds and with and without shadings in addition with the clothing behaviour of human in different seasons in Berlin.
- **Technical Skills:** Radiation Modelling, Ineteractive Data Language(IDL)
- **Soft Skills:** Teamwork, International collaborations, Communication, Presentation skills.

Risk Management Solutions,RMS Noida, India   *Delhi, India*

Intern   *May 2018- Aug 2018*

- Project Undertaken: Worked over catastrophic modelling. I collected all the data sets for the cyclone which happened over Arabian Sea, Bay of Bengal and Indian Ocean with the help of IBTrACS and IMD and plotted the cyclone tracks over these regions. Found some land falling events also and estimated the economic losses. I used R programming for making the plots.
- **Technical Skills:** R Programming, Remote Sensing, Cyclone modelling.
- **Soft Skills:** Teamwork, Time Management, Communication, Presentation skills.

Bharat Heavy Electricals Ltd. (B.H.E.L) *Bhopal, India*

Vocational Training *May 2015- July 2015*

- Worked as a trainee during my 3rd year and learned the manufacturing and working processes of various turbines and heat exchangers which is totally based on working fluid used in Hydro and Thermal Power Plants and the processes of inspection. Learned the manufacturing and working processes of various turbines and heat ex-changer which is totally based on working fluid used in Hydro and Thermal Power Plants and the processes of inspection. Understood the various processes of detection of any flaw in the components, making of Francis turbine, Pelton wheel and Kaplon turbine and many manufacturing processes.

University Projects

Simulation of Semi-automatic Transfer Case *Bhopal, India*

National Institute of Technology, Bhopal *Jan 2016- July 2016*

- To automate the actuation procedure to convert from 2WD to 4WD and make 4WD available for high-speed cornering tracks. Maintaining sufficient road grip to move the vehicle is challenging. It also synchronizes the difference between the rotation of the front and rear wheels, and may contain one or more sets of low range gears for off-road use to reduce driver fatigue. The above projects first designed as prototype in software like CATIA V5 and SOLIDWORKS and further simulation was done in Ansys.
- **Technical Skills:** ANSYS, Catiav5.0, Overleaf, LaTeX.
- **Soft Skills:** Time Management, Teamwork, Presentation skills, Report writing.

Development of Fluidized Bed Gasifier *Bhopal, India*

National Institute of Technology, Bhopal *Aug 2014 - April 2015*

- A chemical reactor that converts wood, or other biomass substances, into a combustible gas. The aim of the design is to generate a nitrogen (N_2) free product gas with low tars. The global circulation rate is driven by the gas velocity in the air/combustion reactor. Modified design for proper vortex circulation in reaction chamber and cyclone filter can create a syn gases. Prototype was made on CATIA V5.
- **Technical Skills:** Python with Pandas, matplotlib.
- **Soft Skills:** Presentation skills, Leadership, Teamwork, Logical Thinking.

Autonomous bot *Mumbai, India*

IIT Bombay *Dec-2014*

- Participated in Tech-fest IIT Bombay 2014 for Grid Warrior event of robotics and made an autonomous bot which had to solve the grid by following the white lines while avoiding the nodes in the arena with the help of sensors using codes in C++ programming and ARM 7 development board micro-controller.

Skills

Programming	Python (NumPy, Matplotlib), R programming (ggplot2), C/C++, MATLAB, IDL, HTML
Technical Softwares	OpenFOAM, ANSYS, CATIA v5.0, SolidWorks, Techplot, MATHEMATICA, Paraview, Origin
Miscellaneous	Linux, LaTeX(Overleaf/TeX studio), Microsoft Office, Git.
Soft Skills	Time Management, Teamwork, Problem-solving, Documentation, Engaging Presentation.

Achievements

2018	**DAAD Awardee**, DAAD International Scholarship	*Germany*
2017	**Score -700/1000**, GATE	*India*
2012	**AIR- 11,133**, IIT JEE Advance	*India*
2012	**AIR- 9,152**, AIEEE Exam	*India*
2012	**Rank- 157**, MP-PET Exam	*M.P., India*
2011	**State rank-207**, International Mathematics Olympiad (IMO)	*India*

Publications

Bulk rise in the interstices of tubes
  Chitransh Atre, Aditya Manoj, Baburaj A. Puthenveettil
  The 17th Asian Congress of Fluid Mechanics (ACFM), 2023, Beijing, China

Capillary rise in the interstices of tubes
  Chitransh Atre, Aditya Manoj, Baburaj A. Puthenveettil
  Proceedings of the 9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP), 2022, IIT Roorkee, India

A Design Procedure for Sintered Copper Flat Heat Pipes
  Nitish Kumar Tripathi, Prafulla P. Shevkar, **Chitransh Atre**, Baburaj A. Puthenveettil
  1st International Conference in Fluid Thermal and Energy Systems ICFTES'22, 2022, NIT Calicut, India

Design to Avoid Dry-out in a Flat Heat Pipe Based on Cu Foam
  Nitish Kumar Tripathi, Prafulla P. Shevkar, **Chitransh Atre**, Baburaj A. Puthenveettil
  9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP), 2022, IIT Roorkee, India

Interests

Badminton Playing	I love to play Badminton. I am an expert in this.
Linux	Since 2017, I have been in love with Linux. I recently switched to Mac OS, which feels like a premium of Linux.
Technical Writing	I write descriptive blogs about Linux some of them are on my GitHub
Art	I have always enjoyed drawing since I was a child. Recently, I have shifted to digital art.
Techno enthusiast	I like to remain updated about the new technologies which are coming.
Playing Synthesizer	I have been playing synthesizer from my childhood. I performed many stage shows in my school and college in orchestra. Won many prizes at regional and national level in my schooling. I have also classical music degree in singing from Prayag Sangeet Samiti, Allahabad.

Languages

Hindi	Native proficiency
English	Professional proficiency
German	Proficiency level- A1.2

References available upon request.