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Chennai, India

# Krithin Gowthaman

Mechanical Engineering Graduate

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## EDUCATION

**Indian Institute of Information Technology Design and Manufacturing Kancheepuram** 2018 — 2022

- Bachelor of Technology in Mechanical Engineering
- CGPA: 9.03/10.00 (Distinction)
- Relevant Coursework: Numerical methods, thermal energy systems, design of heat exchangers, design optimization, inverse problems in engineering, [computational fluid dynamics](#), [fundamentals of compressible flow](#), [interfacial waves](#), [introduction to aircraft design](#), [aircraft stability and control](#),

## EXPERIENCE

**International Centre for Theoretical Sciences - Tata Institute of Fundamental Research (ICTS-TIFR)** Jun 2022 — Present  
*Visiting Student* Bengaluru, India

- Guide: [Dr. Jim Thomas](#)
- Studying two dimensional incompressible geophysical turbulence in the ocean.
- Performing numerical simulations with python using pseudospectral methods to solve the two dimensional vorticity equation.
- Researching the transfer of energy in response to the presence of stochastic vorticity field

**Council of Scientific and Industrial Research - National Aerospace Laboratories (CSIR-NAL), Bengaluru**  
**Birla Institute of Technology and Science (BITS), Pilani-Hyderabad** Aug 2021 — Mar 2022  
*Summer Research Fellow*

- Guides:
  - [Prof. S M Deshpande, Retired Sathish Dhawan Chair Professor](#)
  - [Dr. Anil N](#)
  - [Mr. Keshav Malagi](#)
- Recipient of the Indian Academy of Sciences' Summer Research Fellowship SRFP 2021
- Studied the Least Squares formula used in Least Squares Kinetic Upwind Mesh-free Method (LSKUM) to investigate its spectral bandwidth. [\[Report\]](#)

IISc Bangalore  
BITS, Pilani-Hyderabad  
CSIR-NAL, Bengaluru

**Indian Institute of Technology, Kanpur (IIT-K)** May 2021 — Oct 2021  
*Research Intern* Kanpur, India

- Guide: [Dr. Debopam Das](#)
- Studied the generation and axial interaction of vortex rings with a circular cylinder.
- Performed simulations of novel experimental setup to produce vortex rings devoid of piston and stopping vortices.

**Indian Institute of Information Technology Design and Manufacturing Kancheepuram** Oct 2020 — Apr 2021  
*Research Intern* Chennai, India

- Guide: [Dr. S Jayavel](#)
- Studied the fluid flow and heat transfer over a rotating circular cylinder using simulations on ANSYS Fluent.
- Surveyed relevant literature, validated results and proposed problem statement for undergraduate project.

**Indian Institute of Information Technology Design and Manufacturing Kancheepuram** Nov 2020 — Dec 2020  
*Winter Project Intern* Chennai, India

- Guide: [Dr. Shubhankar Chakraborty](#)
- Proposed the structural design of novel temperature sensing equipment for specialised frustum-shaped stirrer-vessel equipment for application in food processing. Modelled the sensor's size and its location on the stirrer.

## CONFERENCE PUBLICATION

- G Krithin, D Sathish Kumar, J Ramarajan and S Jayavel. 'Impact of relative size and rotation rate of an upstream cylinder on the hydrodynamics of a stationary cylinder in tandem', presented at the 1st International Conference in Fluid Thermal and Energy Systems, June 9-11, 2022, NIT Calicut, Kerala, India, [\[Abstract\]](#) [\[Slides\]](#) [\[Certificate\]](#)

## SKILLS

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|--------------------|--|
| <b>Programming</b> | C/C++, Julia, Python   |
| <b>Software</b>    | ANSYS Fluent, MATLAB & Simulink, CATIA, AutoCAD, Autodesk Inventor   |
| <b>Interests</b>   | Computational fluid dynamics, applied mathematics, scientific computing.<br>Transition to turbulence, flow instabilities, aerodynamics |

## PROJECTS

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### Stochastic parametrization of two dimensional vorticity equation May 2022 — Present

- Studying the variation in the behaviour of two dimensional vorticity in the presence of a stochastic vorticity field with varying relative strengths between the deterministic and the stochastic vorticity fields.
- Learning parallel processing and code optimisation on Python using mpi4py and Cython.

### Hydrodynamics of a rotating upstream cylinder with a stationary cylinder in tandem Oct 2021 — May 2022

[\[Undergraduate Thesis\]](#) [\[Slides\]](#) [\[Presentation Video\]](#)

- Numerical study of cross-flow past rotating cylinders in tandem on ANSYS Fluent.
- Studied the impact of relative sizing, spacing and rotation rate of the cylinders on their hydrodynamics and vortex shedding frequencies.

### Optimisation of the thermal design of the shell and tube heat exchanger [\[Code\]](#) Nov 2020 — Mar 2021

- Wrote a MATLAB code for the thermal design based on variable thermal parameters (input and output temperatures), material properties (density, specific heat capacity), physical structure (diameter, arrangement and number of tubes) and pressure drop in accordance with TEMA guidelines.
- Later included particle swarm optimisation to optimise the output design.

### Finite Element Analysis of landing gear of aircraft [\[Slides\]](#) Mar 2021 — Apr 2021

- Ran simulations on ANSYS APDL to perform finite element analysis of the reactive forces on the oleo strut in the landing gear of an aircraft.

### Design of belt conveyor system [\[Report\]](#) Nov 2020 — Dec 2020

- Studied the process to design a material handling belt conveyor system for the movement of sized coal anthracite, in accordance with CEMA guidelines.

### Comparison of error and computational time of numerical methods for ODE solving [\[Report\]](#) [\[Slides\]](#) Mar 2020 — May 2020

- Compared Runge-Kutta (upto RK5), explicit (Adams-Bashforth, Nystrom, etc.), implicit (Adams-Moulton, Milne-Simpson, etc.) and MATLAB solvers (ode23, ode45, etc.) to solve the ODE in leaky bucket problem.

## ACHIEVEMENTS

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- [Best Oral Presentation Award at The First International Conference in Fluid, Thermal and Energy Systems \(ICFTES\) 2022](#)
- [Recipient of the Indian Academy of Sciences' Summer Research Fellowship Programme 2021](#)
- [Scored 100/100 in Engineering Graphics in AISSCE 2018](#)
- [Ranked in top 10 percentile at school in National Standard Examination in Physics \(NSEP\) 2016](#)

## ACTIVITIES

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### Institute Robotics Club Coordinator Aug 2019 — Apr 2020

- Conducted sessions, organised workshops and competitions for the annual inter-college fest

### Teaching and curriculum volunteer at Vidhai [\[Certificate\]](#) Jan 2020 — Jul 2021

- Vidhai is a student-run initiative to support the education of students of Government schools around IIITDM Kancheepuram
- Taught middle school mathematics at Government School, Kumizhi, Chennai
- Prepared teaching resources for the NTSE and NMMS exams coaching.