

# Roshan Samuel

## PERSONAL INFORMATION

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Ph.D. Student  
Department of Mechanical Engineering  
Indian Institute of Technology - Kanpur  
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Google Scholar: <https://scholar.google.co.in/citations?user=LLwzMe8AAAAJ>

## EDUCATION

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2017–Now	<b>Ph.D. Mechanical Engineering</b> Indian Institute of Technology - Kanpur, Kanpur, India <b>CGPA:</b> 9.5/10.0
2011–2013	<b>M.E. Mechanical Engineering</b> Indian Institute of Science - Bangalore, Bangalore, India <b>Thesis:</b> Development of Vortex Particle Method for Flexing Bodies <b>CGPA:</b> 5.9/8.0
2007–2011	<b>B.Tech. Mechanical Engineering</b> National Institute of Technology - Tiruchirapalli, Tamil Nadu, India <b>Project:</b> Design and Analysis of Multi-link Suspension <b>CGPA:</b> 8.4/10.0

## PROFESSIONAL EXPERIENCE

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2016–2017	<b>Simulation and Modeling Lab</b> Position: Project Associate Project: Development of finite-difference solver in Python Supervisor: Prof Mahendra K. Verma
2014–2016	<b>High Performance Computing Lab</b> Position: Project Engineer Project: Development of compressible flow code with compact schemes Supervisor: Prof Tapan K. Sengupta
2013–2014	<b>General Motors Technical Center - India</b> Position: Thermal CFD Engineer Responsibilities: CFD Analysis of automotive cabins and under-hood systems

## PUBLICATIONS

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### Journal Publications

1. **SAMUEL, R.**, SAMTANEY, R., AND VERMA, M. K. Large-eddy simulation of Rayleigh-Bénard convection at extreme Rayleigh numbers. *Phys. Fluids* 34, 7 (2022), 075133
2. SENGUPTA, A., **SAMUEL, R. J.**, SUNDARAM, P., AND SENGUPTA, T. K. Role of non-zero bulk viscosity in three-dimensional Rayleigh-Taylor instability: Beyond Stokes' hypothesis. *Comput. Fluids* 225 (2021), 104995
3. **SAMUEL, R.**, BHATTACHARYA, S., ASAD, A., CHATTERJEE, S., VERMA, M. K., SAMTANEY, R., AND ANWER, S. F. SARAS: A general-purpose PDE solver for fluid dynamics. *J. Open Source Softw.* 6, 64 (2021), 2095
4. VERMA, M. K., **SAMUEL, R.**, CHATTERJEE, S., BHATTACHARYA, S., AND ASAD, A. Challenges in fluid flow simulations using exascale computing. *SN Comput. Sci.* 1, 3 (2020), 178
5. SADHUKHAN, S., **SAMUEL, R.**, PLUNIAN, F., STEPANOV, R., SAMTANEY, R., AND VERMA, M. K. Enstrophy transfers in helical turbulence. *Phys. Rev. Fluids* 4 (2019), 084607
6. VASHISHTHA, S., **SAMUEL, R.**, CHATTERJEE, A. G., SAMTANEY, R., AND VERMA, M. K. Large eddy simulation of hydrodynamic turbulence using renormalized viscosity. *Phys. Fluids* 31, 6 (2019), 065102
7. VASHISHTHA, S., VERMA, M. K., AND **SAMUEL, R.** Large-eddy simulations of turbulent thermal convection using renormalized viscosity and thermal diffusivity. *Phys. Rev. E* 98 (2018), 043109
8. SHARMA, N., SENGUPTA, A., RAJPOOT, M., **SAMUEL, R. J.**, AND SENGUPTA, T. K. Hybrid sixth order spatial discretization scheme for non-uniform cartesian grids. *Comput. Fluids* 157 (2017), 208–231

### Conference Presentations

1. **SAMUEL, R.**, SAMTANEY, R., AND VERMA, M. K. Large-eddy simulation of Rayleigh-Bénard convection at extreme Rayleigh numbers up to  $10^{15}$ . Euromech Colloquium 619, Vienna, 6-9 July, 2022

### Thesis

1. **SAMUEL, R.** Development of Vortex Particle Method for Flexing Bodies. Master's thesis, IISc Bangalore, 2013

## SCHOOLS AND WORKSHOPS ATTENDED

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2021	GPU Application Hackathon organized by CDAC and nVidia
2018	Turbulence from Angstroms to Lightyears organized by ICTS

## SOFTWARES DEVELOPED/CONTRIBUTED

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| 2019 | <a href="#">blitz++</a> : Contributed to development of Blitz library.      |
| 2020 | <a href="#">SARAS</a> : Developed the open-source finite-difference solver. |

## HONORS, AWARDS & SCHOLARSHIPS

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| 2014 | Green Belt in Design for Six-Sigma (DFSS) awarded at General Motors                              |
| 2014 | Individual Excellence Award by General Motors for design synthesis using CFD thermal simulations |
| 2014 | Individual Excellence Award by General Motors for developing scripts to automate CFD analysis    |
| 2010 | Summer Undergraduate Research Grant for Excellence (SURGE) awarded by IIT-Kanpur                 |

## CERTIFICATIONS

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| 2013 | Training Certificate in Introduction of ANSYS Design, ANSYS Meshing and FLUENT awarded by ANSYS        |
| 2010 | Attendance Certificate in A1 - Elementary Level 1 German by Goethe Institut/Max Mueller Bhavan Chennai |
| 2009 | Certificate in Foundation Course on CATIA v5r15 awarded by CADD Center                                 |

## PERSONAL INTERESTS

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Hiking, Cycling, Hobby Programming, Astronomy

## LANGUAGES

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English, Malayalam (native)  
Hindi (basic)  
French, German (beginner)

August 19, 2022