Roshan Samuel

Personal Information

Ph.D. Student
Department of Mechanical Engineering
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Education

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

Professional Experience

2016–2017	**Simulation and Modeling Lab**	
	Affiliation: Department of Physics, IIT-Kanpur	
	Project: Development of finite-difference solver in Python	
	Supervisor: Prof Mahendra K. Verma	
2014–2016	**High Performance Computing Lab**	
	Affiliation: Department of Aerospace Engineering, IIT-Kanpur	
	Project: Development of compressible flow code with compact schemes	
	Supervisor: Prof Tapan K. Sengupta	
2013–2014	**General Motors Technical Center - India**	
	Position: Thermal CFD Engineer	
	Responsibilities: CFD Analysis of automotive cabins and under-hood systems	

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

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

Software Developed/Contributed

2019	blitz++: Contributed to development of Blitz library.
2020	SARAS: Developed the open-source finite-difference solver.

Honors, Awards & Scholarships

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

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

Hiking, Cycling, Hobby Programming, Astronomy

Languages

English, Malayalam (native)

Hindi (basic)

French, German (beginner)

August 25, 2022