



**Ganesh Natarajan**  
Ph.D. (IISc Bangalore)  
Associate Professor, Mechanical Engineering  
n.ganesh@iitpkd.ac.in, 04923-226428  
<http://www.iitpkd.ac.in/people/n.ganesh>



### Research Interests

- Immersed Boundary Methods
- Novel algorithms for fluid flow and heat transfer on unstructured meshes
- Compressible flows
- Sports aerodynamics - Mathematical modelling and experiments

### Brief Summary of Research

My research is in the broad area of Computational Fluid Dynamics (CFD) and focusses on development of novel algorithms for fluid flows and heat transfer. My recent interests lie in immersed boundary methods and their application to multi-physics applications, both in low and high speed regimes. I am also interested in mathematical modelling and sports aerodynamics with a specific focus on cricket and badminton.

### Projects

- “AnuPravaha-II - Development of an indigenous unstructured data based flow solver for incompressible flows and heat transfer”, DAE-BRNS, Rs 500 lakhs, 2013-2019 (as co-PI, PI: Dr. Amaresh Dalal, IIT Guwahati).
- “Compressible flow solver with immersed boundary approach”, ISRO-RESPOND project, Rs 16 lakhs, 2018-2019 (as co-PI, PI: Dr. Vinayak Kulkarni, IIT Guwahati).

### Recent Publications

(Full list of publications may be found at <https://sites.google.com/site/ganucfd/publications>)

- Deka, M., Brahmachary, S., Thirumalaisamy, R., Dalal, A., and **Natarajan, G.**, “A new Green–Gauss reconstruction on unstructured meshes. Part I: Gradient reconstruction”, *Journal of Computational Physics*, 2019 (in press)
- Brahmachary, S., **Natarajan, G.**, Kulkarni, V., and Sahoo, N., “A sharp-interface immersed boundary framework for simulations of high-speed inviscid compressible flows”, *International Journal for Numerical Methods in Fluids*, 2018.
- Patel, J.K., and **Natarajan, G.**, “Diffuse interface immersed boundary method for multi-fluid flows with arbitrarily moving rigid bodies”, *Journal of Computational Physics*, 350, 2017.
- **Natarajan, G.**, “Bio-allometry inspired resource estimation in Twenty20 cricket”, *Proceedings of the IMechE, Part P: Journal of Sports Engineering and Technology*, 229(4), 2015.
- Basumatary, M., **Natarajan, G.**, and Mishra, S.C., “Defect correction based velocity reconstruction for physically consistent simulations of non-Newtonian flows on unstructured grids”, *Journal of Computational Physics*, Vol. 272, 2014.