Name: Dr. Yogesh G. Bhumkar

Contact Information:

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Research Interests:

1. High Accuracy, High Performance Computing: DNS and LES

2. Theoretical and Computational Fluid Dynamics

(a) Nonlinear Stability Theory and Bypass Transition

(b) Instability and Transition of Flows

Education:

(1) Completed Ph.D. thesis in the Department of Aerospace Engineering, Indian Institute of Technology Kanpur

• Thesis Topic: High Performance Computing of Bypass Transition

• Adviser: Professor Tapan K. Sengupta

•Area of Study:- Computational study of bypass transitional flows: Receptivity Approach

(2) M.E., Department of Space Engineering and Rocketry, Birla Institute of Technology Mesra, Ranchi, Jharkhand, June 2006

• Thesis Topic: Numerical and Experimental Study of Flow around a Pair of Circular Cylinders in Incompressible Flow

• Adviser: Dr. Arnab Roy

(3) B.E., Department of Mechanical Engineering, Govt. College of Engineering Pune, Pune, Maharashtra, June 2002

• B.E. Project: Retractable Landing Gear Design for Remotely Controlled Aircrafts

Employment:

1. Senior student research associate from August 2011 to July 2012 at High Performance Computing Lab., Aerospace Engg. Dept., IIT Kanpur, Kanpur, India under the guidance of Prof. Tapan K. Sengupta.

Awards:

1. 1st prize in the technical paper competition on the subject "Aerodynamics" at Cummins Girls Engineering College Pune, 2002.

Invited talk:

1. "Numerical filters for Large Eddy Simulations", at a short term QIP sponsored course on Advanced Computing in Engineering and Sciences, IIT Kanpur, Kanpur, India, Oct. 05-09, 2010.

2. "Parallel computing using Massage Passing Interface", at a short term QIP sponsored course on Advanced Computing in Engineering and Sciences, IIT Kanpur, Kanpur, India, Oct. 05-09, 2010.

3. "High performance computing of transitional flow past an aerofoil", at conference on Advanced Topics and Auto Tuning in High Performance Scientific Computing, National Taiwan University, Taipei, Taiwan, March 27-29, 2013.

Publication List

[1] Journal Publications:

1. Control of bypass transitional flow past an aerofoil by Plasma actuation, Tapan K. Sengupta, V. K. Suman and Yogesh G. Bhumkar, Accepted in **International Journal of Emerging Multidisciplinary Fluid Sciences** (2012)

2. Direct Numerical Simulation of Transition over a Natural Laminar Flow Aerofoil, Tapan K. Sengupta, Yogesh G. Bhumkar. **Frontiers in Aerospace Engineering** (2012) (paper accepted)

3. Dynamics and instability of a shielded vortex in close proximity of a wall, Tapan K. Sengupta, Yogesh G. Bhumkar and Soumyo Sengupta, Accepted in **Computers and Fluids**, vol. 70, pp 166-175 (2012).

4. Spurious waves in discrete computation of wave phenomena and flow problems, Tapan K. Sengupta, Yogesh G. Bhumkar, Manoj K. Rajpoot, V. K. Suman and Shakti

Saurabh, **Journal of Applied Mathematics and Computation**, vol. 218, pp 9035-9065 (2012).

5. Direct numerical simulation of two-dimensional wall-bounded turbulent flows from receptivity stage, Tapan K. Sengupta, Swagata Bhaumik and Yogesh Bhumkar, **Physical Review E.**, vol. 85(2), 026308 (2012)

6. Adaptive multi-dimensional filters, Yogesh G. Bhumkar and Tapan K. Sengupta, **Computers & Fluids**, vol. 49, pp 128-140 (2011).

7. Space-time discretizing optimal DRP schemes for flow and wave propagation problems, Tapan K. Sengupta, Manoj K. Rajpoot and Yogesh G. Bhumkar, **Computers & Fluids**, vol. 47(1), pp 144-154 (2011).

8. A linear focusing mechanism for dispersive and non-dispersive wave problems, Yogesh G. Bhumkar, Manoj K. Rajpoot and Tapan K. Sengupta, **Journal of Computational Physics**, vol. 230(4), pp 1652-1675 (2011).

9. New explicit two-dimensional higher order filters, Tapan K. Sengupta, Yogesh G. Bhumkar, **Computers & Fluids**, vol 39, pp 1848-1863 (2010).

10. Drag reduction by rotary oscillation for flow past a circular cylinder, Yogesh G. Bhumkar, Tapan K. Sengupta, **International Journal of Emerging Multidisciplinary Fluid Sciences**, vol. 1(4), pp 269-299 (2010).

11. Design and analysis of a new filter for LES and DES, Tapan K. Sengupta, Yogesh G. Bhumkar and V. Lakshmanan, **Computers & Structures**, vol. 87(11-12), pp 735-750 (2009).

[2] Conference Publications:

1. A new filter designed for LES and DES, Tapan K. Sengupta, Yogesh G. Bhumkar and V. Lakshmanan, at **5th MIT Conference on Advances in CFD**, June 17-19, 2009.

2. DNS, LES and high accuracy computing, T. K. Sengupta, Swagata Bhaumik and Yogesh Bhumkar, at **International Conference on Metacomputing** held at National Institute of Oceanography, Dona Paula, Goa on December 17 2010.

3. Nonlinear receptivity and instability studies by proper orthogonal decomposition, Tapan K. Sengupta, Swagata Bhaumik and Yogesh G. Bhumkar, at **6th AIAA Theoretical Fluid Mechanics Conference** Hawaii, June 2011.

4. Direct numerical simulation in CFD, Tapan K. Sengupta, Swagata Bhaumik and Yogesh Bhumkar, at **International Conference on Metacomputing** at National Institute of Oceanography, Dona Paula, Goa on December 2011.