

ABHILASH R. MALIPEDDI

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EDUCATION

The George Washington University, Washington, D.C., USA

Ph.D., Mechanical Engineering

2021*

Dissertation: Rheology, diffusion and micro-structural evolution of sheared suspensions of deformable particles

Advisor: Kausik Sarkar

Indian Institute of Technology Madras, Chennai, India

Master of Technology, Mechanical Engineering Specialization in Energy Technology 2011

Thesis: "Influence of duct geometry on the performance of Darrieus turbine"

Advisor: Dhiman Chatterjee

Indian Institute of Technology Madras, Chennai, India

Bachelor of Technology, Mechanical Engineering

2011

PROFESSIONAL EXPERIENCE

The George Washington University Washington, D.C., USA

Research Assistant

SEPTEMBER 2013–PRESENT

Aidle Private Limited Pune, India

Technical Advisor - Product Design

JULY 2017–JULY 2019

- Designing and prototyping components for wearable devices in a start-up
- Launched two IoT products designed to have a positive social impact
- Developing vendor relations for outsourcing production

NTPC Limited Chennai & Ramagundam, India

Assistant Manager (Operation, Commissioning)

AUGUST 2011–JULY 2013

- Commissioning of thermal power generation station (VTPS Units 1 & 2).
- Managing 10+ personnel to ensure safe operation of a 500MW power generation unit.
- Applying ML tools to solve process issues e.g. clinker formation in the furnace.
- Developing time-series analysis of power-grid frequency to predict excursions.
- Liaising with sister units to safely manage station output as needed to ensure grid stability

Indian Institute of Sciences Bangalore, India

Intern (Force Microscopy Lab)

SUMMER 2008

- Designed sample holder for Transmission Electron Microscope *in-situ* nano-indenter.

HONORS & AWARDS

- ▶ Outstanding Accomplishment in Research awarded by Office of Vice President for Research, The George Washington University 2015
- ▶ Travel Award by APS to present at the APS Physics Canada-America-Mexico Conference in Oaxaca, Mexico 2015
- ▶ GW Fellowship 2013-2019
- ▶ The MCM Scholarship awarded by Indian Institute of Technology Madras 2010

- PUBLICATIONS**
1. **Abhilash Reddy Malipeddi** and Kausik Sarkar. Collective diffusivity in a sheared viscous emulsion: Effects of viscosity ratio. *Physical Review Fluids*, 4(9), 093603, 2019
 2. **Abhilash Reddy Malipeddi** and Kausik Sarkar. Shear-induced collective diffusivity down a concentration gradient in a viscous emulsion of drops. *Journal of Fluid Mechanics*, 868:5–25, 2019.
 3. Sagnik Singha, **Abhilash Reddy Malipeddi**, Mauricio Zurita-Gotor, Kausik Sarkar, Kevin Shen, Michael Loewenberg, Kalman B. Migler, and Jerzy Blawdziewicz. Mechanisms of spontaneous chain formation and subsequent microstructural evolution in shear-driven strongly confined drop monolayers. *Soft Matter*, 15(24):4873–4889, 2019.
 4. Priyesh Srivastava, **Abhilash Reddy Malipeddi**, and Kausik Sarkar. Steady shear rheology of a viscous emulsion in the presence of finite inertia at moderate volume fractions: Sign reversal of normal stress differences. *Journal of Fluid Mechanics*, 805:494–522, 2016.
 5. **Abhilash Reddy Malipeddi** and Dhiman Chatterjee. Influence of duct geometry on the performance of Darrieus hydroturbine. *Renewable Energy*, 43:292–300, 2012.
(in preparation)
 6. **Abhilash Reddy Malipeddi** and Kausik Sarkar. Hydrodynamic self-diffusivity in non-dilute sheared emulsions
 7. **Abhilash Reddy Malipeddi**, Anik Tarafder and Kausik Sarkar. Deformation characteristics and breakup of a viscoelastic drop in time-periodic extensional flows.
 8. **Abhilash Reddy Malipeddi** and Kausik Sarkar. Effect of cell stiffness on the shear induced self-diffusivity of red blood cell suspensions

TEACHING EXPERIENCE	Graduate Teaching Assistant, <i>Mechanical and Aerospace Engineering</i>	
	MAE 3166W: Materials Science & Engineering, (Writing G. A.)	FALL 2017
	MAE 6229: Propulsion	SPRING 2016
	APSC 6213: Analytical Methods in Engineering III: PDEs	FALL 2016

- TECHNICAL SKILLS**
- ▶ Programming Languages: Fortran, C, C++, Matlab, Python, R, Bash
 - ▶ Parallel Programming: MPI, OpenMP, some GPU
 - ▶ High Performance libraries: hypre, PETSc, Trilinos
 - ▶ Visualization tools: vtk, Paraview, Tecplot, Matplotlib

- GRANTS**
- Contributed to:
1. Extreme Science and Engineering Discovery Environment (XSEDE) research allocation grant, 2019. PI: Kausik Sarkar, "Rheology, diffusion and micro-structural evolution of emulsions of complex fluids", Grant # CTS180042 Renewal, Award value: **\$16,682.00**
 2. Extreme Science and Engineering Discovery Environment (XSEDE) research allocation grant, 2018. PI: Kausik Sarkar, "Rheology, diffusion and micro-structural evolution of emulsions", Grant # CTS180042 New, Award value: **\$16,588.67**
 3. Extreme Science and Engineering Discovery Environment (XSEDE) startup allocation grant, 2017. PI: Kausik Sarkar, "Rheology of emulsions in the presence of inertia", Grant # CTS170042, Award value: **\$1841.00**

- CONFERENCE TALKS**
1. APS Division of Fluid Dynamics Conference 2019, Seattle, Washington, "Shear induced gradient diffusivity of red blood cell suspensions"
 2. Burgers Symposium 2019, Johns Hopkins University, Baltimore, "Shear-induced diffusion of deformable particles using dynamic structure factor"

3. APS March Meeting 2018, Los Angeles, California, "Shear-induced gradient diffusivity of emulsions at finite inertia"
4. Burgers Symposium 2018, The George Washington University, "Hydrodynamic collective diffusion in emulsions under shear flow"
5. APS Division of Fluid Dynamics Conference 2017, Denver, Colorado, "Shear-induced gradient diffusivity in emulsions"
6. Northeast Regional Soft Matter Workshop, 2017, Princeton University, "Computation of shear-induced collective diffusivity in emulsions"
7. Burgers Symposium 2016, Johns Hopkins University, Baltimore, "Computation of viscoelastic drop deformation in periodic planar extensional flows"
8. APS Physics Canada-America-Mexico Conference 2015, Oaxaca, Mexico, "Effects of a fluid filament's curvature on its stability"
9. Society of Rheology 87th Annual Conference 2015, Baltimore, "Deformation of a viscoelastic drop in periodic planar extensional flows"

POSTER
PRESENTATIONS

1. SEAS R&D Showcase 2019, "Shear induced gradient diffusivity of red blood cell suspensions"
2. SEAS R&D Showcase 2018, "Computation of collective diffusivity in emulsions at finite inertia"
3. SEAS R&D Showcase 2017, "Flow induced diffusion of deformable particles"
4. GWU Research Days 2015, "Deformation characteristics of a viscoelastic drop in periodic plane extensional flows" (Award Winner)
5. SEAS R&D Showcase 2015, "Dynamics of a viscoelastic drop in time-periodic flows"

PROFESSIONAL
AFFILIATIONS

Member APS, SOR, SIAM

2015–

PROFESSIONAL
SERVICE

Reviewer

- ▶ Journal of Fluids Engineering

OUTREACH
ACTIVITIES

2016 AIAA-National Capital Section Judge at DC STEM fair.

ACTIVITIES &
INTERESTS

Physical Computing, Computational Geometry, Science Outreach, Mechanical Design