

# VENKATA KRISHNA PYDAKULA NARAYANAN

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## Research Engineer - Multiphysics Modeling

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### PROFILE

- 6+ years of experience in developing CFD and DEM based research tools for industrially driven engineering applications with 3 peer-reviewed publications in reputed journals.
  - Principal researcher in the world's first group to discover the effect of electrifying sprays to reduce the cost and environmental impact of automobile manufacturing.
  - Expert in numerical methods, multiphysics modeling, data visualization, science communication.
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### SKILLS

Fortran, C++, MATLAB, Python, MPI, Git, GNU Octave  
ANSYS, Star-CCM+, ParaView, VisIt, LIGGGHTS, LAMMPS, Ovito

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### WORK HISTORY

#### Research Assistant | Montana State University

June 2019 - May 2023, Bozeman MT

- Conducted research on industrial applications of multiphase atomizing flows using Computational Fluid Dynamics (CFD).
- Developed the world's first high-fidelity 3D numerical model enabled with HPC and electrohydrodynamics to study droplet physics in automotive rotary atomizers.
- Created a dual-mesh framework to improve the accuracy of the predicted electric field. The new formulation provides realtime boundary conditions and avoids arbitrary assumptions.
- Implemented a faster Poisson solver algorithm leading to a 30% speedup.
- Quantifiably discovered the effect of electrification on droplet size and charge characteristics.
- Demonstrated ways to reduce the cost and environmental impact of automotive paint shops.
- Successfully collaborated with a cross-functional team at **Ford Motor Company** and **PPG Industries**.

#### Summer Intern | Ford Motor Company

May 2022 - Aug 2022, Dearborn MI

- Conducted numerical simulations of the battery electrode calendaring process.
- Built a new discrete element method (DEM) simulation on LIGGGHTS to study the evolution of an electrode microstructure.
- Performed numerical experiments to reduce the cost of experimental procedures bringing up to 15,000 USD savings to the R&D group.
- Conceptualized the physics of calendaring and laid out foreseeable goals for the project.

#### Engineering and Planning Intern | Gulf Spic

May 2016 - July 2016, Ahmadi Kuwait

- Attained exposure to manufacturing processes in an engineering services contracting firm.
  - Provided technical assistance in engineering design and understanding client's requirements.
  - Assisted the quality control team with investigating weld quality of steel pipe sections.
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### EDUCATION

Montana State University, Bozeman, MT

**PhD** Mechanical Engineering | 3.9 GPA | 2019 - May 2023

**MS** Mechanical Engineering | 3.8 GPA | 2017 - 2019

National Institute of Technology, Trichy, India

**B.Tech** Mechanical Engineering | 3.2 GPA | 2013 - 2017