Siva Karthikeya Mandarapu

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Born: 10.November 1999 in Andhra Pradesh (India)

Education

10/2022 - Present **M.Sc. in Computational Science and Engineering** , *Technical University of Munich*, Munich, Germany
Focus: Deep Learning methods for Computational Fluid Dynamics

07/2017 - 08/2021 **B.Tech.(Honours) in Aerospace Engineering**, *SASTRA Deemed University*, Thanjavur, India
Thesis: Effect of Drag correlations on Multiphase Eulerian-Eulerian Flow simulations
Focus: Multiphase simulations, Aerodynamics, Flight Physics

Work Experience

04/2023 - Present **Working Student CFD**, *Numeric Systems GmbH*, Munich, Germany
- Set up of external and internal flow simulations in Pacefish (software based on Lattice Boltzmann Method).
- Developing tooling for the post-processing of CFD simulations with Paraview and further integrating it with Pacefish.

10/2021 - 09/2022 **Project Associate (FEM)**, *Centre for Nano Science and Engineering, Indian Institute of Science*, Bengaluru, India
- Ideated, designed, and manufactured a customized Torque Flange using FEA principles to integrate a novel in-house developed SAW sensor for Torque Measurement.
- Developed techniques for Mechanical and Electrical characterization of Strain and SAW sensors for Pressure and Torque-sensing.
- Optimized the epoxy bonding process of SAW sensors on the metal substrate to obtain accurate strain data during Mechanical characterization.

08/2021 - 10/2021 **CAE Engineer - Contract**, *Spacebit*, London, UK
- Designed and developed the structure and mechanisms of the payload as per requirements using FEA principles for Spacebit's lunar mission.
- Conducted multiple Structural and Thermal analysis to qualify the payload for sustaining launch, cruise, and lunar landing environments.
- Compiled technical drawings to space-grade standards and suggested manufacturing methods to manufacture the payload.

Internships

03/2021 - 08/2021 **CFD Intern**, *FOSSEE, Indian Institute of Technology Bombay*, Mumbai, India
- Performed multiphase analysis of a Fluidized Bed for three different drag correlations to identify the most reliable model for computational modeling of Dispersed-Multiphase flows.
- Implemented the Eulerian two-fluid modeling approach using the twoPhaseEulerFoam solver in OpenFOAM.
- Validated the computational results against the experimental data generated by National Energy Technology Laboratory (NETL).
- Optimized the default Syamlal O'Brien drag model in OpenFOAM as per the problem statement which further yielded accurate results.

10/2020 - 12/2020 **CFD Intern**, *Simulation Lab*, Pune, India

- Analyzed the effect of Flaps with spherical extrusions at 6 different Wing and Flap Angles of attack using ANSYS Fluent.
- Determined the Wing-Flap configuration with maximum Aerodynamic efficiency.
- Represented fellow interns in the cross-fire round against mentors to discuss the results generated during the internship.

Personal Projects

08/2020 - 01/2021 **Prediction of the Flow field and Heat transfer characteristics during Re-entry**, *SASTRA Deemed University*, Thanjavur, India

- Simulated Mach 27 flow around an axisymmetric Re-entry body in MARS atmosphere composed of 6 different species with 4 types of catalytic wall boundary conditions.
- Investigated the effect of dissociation of species in the flow on parameters like Mach number, Temperature, and Heat flux using Arrhenius rate equations in ANSYS Fluent.

08/2020 - 01/2021 **Singapore Space Challenge 2021**, *SASTRA Deemed University*, Thanjavur, India

- Designed a lunar rover to conduct a topographical study of the Lunar Lava Tubes on moon using an onboard GPR and a deep-learning based RTAB navigation system
- Utilized the LROC Quickmap to determine the most feasible landing site for the mission on the basis of skylight size and location.
- Determined the path and way points for the rover from LROC data based on the terrain conditions and local inclination.

Publications

12/2021 **48th National Conference on Fluid Mechanics and Fluid Power**

Siva Karthikeya M, Ashley Melvin, Divyesh Variya, Janani Srree Murallidharan.(2023). **A Comparison study of Drag correlations for a Dispersed Multiphase flow in a Fluidized bed**. 978-981-19-7054-2, Suvanjan Bhattacharyya: Fluid Mechanics and Fluid Power (Vol.1), 530057 1 En (80). Springer.

Skills

Software knowledge

Expert	ANSYS Fluent and Mechanical, Solidworks
Advanced	Star CCM+, MATLAB, OpenFOAM, Paraview, C++, Python
Beginner	Simcenter 3D, Tableau, COMSOL Multiphysics, Nastran/Patran, Git, LaTeXand Linux OS

Languages

Telugu	Native level	
German	Basic knowledge. Enrolled in an A2 language course	***Goethe Zertifikat A1***
English	Business fluent in spoken and written	***TOEFL C1***

Extracurricular Activities

- o Teaching Assistant - OpenFOAM Workshop, FOSSEE Project, IIT Bombay
- o Mechanical Team Lead, Singapore Space Challenge 2021, Team Hitchhikers
- o Vice Captain, SAE Aero design Challenge 2020, Team UDYAT
- o Secretary and Treasurer Aeromodelling Club, SASTRA Deemed University
- o Joint Secretary- School of Mechanical Engineering, SASTRA Deemed University

Interests

Professional	Computational Fluid Dynamics, Deep Learning, Image Processing
Personal	Guitar,Hiking