SREEKAR REDDY SAJJALA

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Skills

C — 90

C++ — 70

Python — 85

MATLAB — 70

Siemens NX — 95

ANSA — 70

Ansys — 85

ABAQUS — 75

Optistruct — 80

Star-CCM+ — 70

OpenFOAM — 75

Languages

German — A2

English — C1

A process-driven, and articulate Master's student in Computer-Aided Mechanical Engineering with expertise in theoretical and computational aspects of Mechanics.

Work Experience

Internship [Voluntary]
Volocopter HQ - Bruchsal, Germany

02/2023 - Present

- Performed mechanical/ thermal benchmark simulations for **CFRP** parts and battery pack using **Optistruct and StarCCM+**.
- Performed modal simulations on the battery pack to analyze and improve the eigenfrequencies.
- Performed explicit dynamics simulations using **Radioss** on the individual cell under compression and bending loads.
- Conducted mechanical simulations on battery pack under crash loads to examine stresses and strains using Optistruct.
- Investigated thermal and thermo-mechanical strains and stresses in case of **thermal runaway (TR)** for various configurations.
- Realized fatigue and lifetime evaluations of CFRP and thermosetting plastics.
- Developed an overall understanding and strategy to mitigate thermal strains due to temperature gradients.
- I was part of the Mechanical Integration team inside the Battery team and was involved in the day-to-day design evolution of the battery pack.
- Familiarization with ASTM D3039/D3039M, DO-160G and UN38.3.4

Wissenschaftliche Hilfskraft
Digital Additive Production DAP - RWTH Aachen

02/2023 - Present

- Understood the theoretical implementation of adjoint-based **topology optimization** methods.
- Investigated existing topology optimization techniques using continuous and discrete adjoint methods in open-source software.
- Created a workflow to perform passively coupled topology optimization for **Conjugate Heat Transfer (CHT)** cases using **DAFoam**.
- Automated the geometry preparation, meshing, running design iterations, and coupling in a cycle using Python.

Mini Thesis
Digital Additive Production DAP - RWTH Aachen

05/2022 - 01/2023

- Developed simulation-based NN model for evaluating cooling channel designs in **Additively Manufactured (AM)** components.
- Ran **CHT/ CFD** simulations of cooling channels (Additive Manufacturing) using **OpenFOAM**.
- Evaluated vital parameters for several input configurations; heat transfer, head loss, structural integrity, etc.
- Created a **Graph Neural Networks (GNN)** regression model to fit the simulation data.
- Optimized the cooling channel design for the desired configuration.
- Reduced development time by eliminating tedious case setups and long simulation run times, benefiting industries reliant on heat conduction and convection.

Wissenschaftliche Hilfskraft
Chair of Continuum Mechanics - RWTH Aachen

05/2022 - 08/2022

- Optimized/ cleaned-up **MATLAB** code to generate Aerogel geometry.
- Generated partial C++ code for better performance.
- Created input scripts for **ABAQUS** for FEM simulation of Aerogel.

Wissenschaftliche Hilfskraft
Chair of Thermodynamics of Mobile Energy Conversion Systems - RWTH Aachen

02/2022 - 01/2023

- Optimized/ debug Visual Basic (VBA) code for examination software.
- Created a Python GUI software using PyQt5.

Addl. Skills

TensorFlow 2.0   75

PyTorch   85

Deal.ii   50

Tosca   50

nTopology   60

Salome   85

Code Aster   50

Julia   50

Lammps   50

COMSOL   90

CAE Engineer
Upwork

- Successfully completed 18 research projects related to FEM, CFD, and FSI.
- Worked on designing/ simulations using - (Siemens NX, Ansys, ABAQUS, MATLAB,and COMSOL.)

Research Scholar
IIT Madras - Chennai, India

- Developed a custom C++ solver in **OpenFOAM-v1712**.
- Investigated thermal, momentum, and phase-fraction evolution at different casting speeds to identify optimum parameters for best casting quality.
- Employed **Ansys Mechanical APDL** to study creep during casting process.

Research Intern
RCI Lab - Hyderabad, India

- Designed a mechanical **fastener** for a flight vehicle to withstand transient and random vibration forces.
- Streamlined designing process with a **MATLAB** program to create a fastener based on vital parameters.
- Conducted FEM simulation in ABAQUS to investigate stresses and normal forces acting on the flight vehicle frame.

Education

Master of Science: Computer Aided Mechanical Engineering
2020 - Present

RWTH Aachen University - Germany

Mini-Thesis: Development of an intelligent and simulation-based model for design evaluation of cooling channels for L-PBF.
Courses: Nonlinear Structural Mechanics, Advanced Finite Element Methods, Advanced Software Engineering, Artificial Neural Networks in Structural Mechanics, Practical Introduction to FEM, Computational Fluid Dynamics, Parallel Computing for Computational Mechanics.

Bachelor of Technology: Mechanical Engineering
2015 - 2019

BML Munjal University - India

Bachelor's Thesis: Computational simulation of convectional and ultrasonic techniques in Direct-chill casting of Aluminum alloys.
Mini-project: Study of flow and alloy segregation during solidification of Aluminum alloys.
Courses: Computer programming in C, Computational Fluid Dynamics, Machine Design, Manufacturing Process, Mechanical Vibrations, Robotics, Bio-Mechanics, Micro Machining, Nanoscience: From synthesis to few applications.

Publications

- Nazym S. Sagandykova, et al., (2021) Patient-specific CFD simulation of aerodynamics for nasal pathology: a combined computational and experimental study, Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization, 9:5, 470-479, https://doi.org/10.1080/21681163.2020.1858968

- LeeWei Loon, et al., (2019) CFD simulation of direct chill casting process of magnesium alloy billets, Journal of Manufacturing process,Volume 45, 447-454, https://doi.org/10.1016/j.jmapro.2019.07.033

Projects

- **FEM/ CFD** and **vibration** study of the launch vehicle during re-entry.
- Calculated von-mises stresses in lumbar spine prosthetic in **ABAQUS**.
- Trained a **Deep Convolution Neural Network** to predict co-ordinates on an aircraft from sensor data.
- Numerical simulation of dry adhesion of SWCNT (Single Walled CNT) using **Lammps**.