



# SREEKAR REDDY SAJJALA

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## Skills \*

C

C++

Python

MATLAB

Siemens NX

ANSA

Ansys

ABAQUS

Optistruct

Star-CCM+

OpenFOAM

## Languages

German

A2

English

C2

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 + Master Thesis

Siemens Energy - Mülheim, Germany

10/2023 - Present

Topic: CFD Analysis of **H2 Combustion Gas Turbines** and building **Generative Design Toolchain**.

- Acquire in-depth proficiency in using Siemens Energy's advanced toolchain for combustion simulations and automation; gaining insights into its functionalities.
- Explore generative design methodologies and workflows, implementing various design possibilities and optimizing engineering solutions.
- Integrate self-learning algorithms into the design toolchain, enhancing its efficiency and adaptability.
- Apply the developed toolchain to the practical scenario of H2 combustion gas turbine to minimize boundary layer flashback.

### Internship [Voluntary]

Volocopter HQ - Bruchsal, Germany

02/2023 - 08/2023

- 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.
- Familiarized with ASTM D3039/D3039M, DO-160G and UN38.3.4

### Student Research Assistant

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.

### Student Research Assistant

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.

## Certifications & Training

- Siemens NX
- The Finite Element Method for Problems in Physics
- Robotics
- StarCCM+ Battery Thermal Study
- Aerodynamics
- Turbulent Flows
- Topology Optimization for Additive Manufacturing

### Student Research Assistant

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.

### CAE Engineer

Upwork

03/2019 - 08/2020

- Successfully completed 18 research projects focused on Computer-Aided Design (CAD), Finite Element Method (FEM), Computational Fluid Dynamics (CFD), and Fluid-Structure Interaction (FSI).
- Utilized various software tools including Siemens NX, Ansys, ABAQUS, COM-SOL, and MATLAB for designing and conducting simulations.
- Applied expertise in CAD software to develop precise and efficient designs, ensuring accuracy and functionality. Employed advanced simulation techniques to achieve optimized performance and reliability.

### Research Scholar

IIT Madras - Chennai, India

01/2019 - 06/2019

- 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.

## Education

### Master of Science: Computer Aided Mechanical Engineering

RWTH Aachen University - Germany

2020 - Present

**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

BML Munjal University - India

2015 - 2019

**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>