



SREEKAR REDDY SAJJALA

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🌐 <https://sreekar2858.github.io/cv/>

Skills *

C 90

C++ 70

Python 85

MATLAB 70

Siemens NX 95

ANSA 70

Ansys 85

ABAQUS 75

Optistruct 80

Star-CCM+ 85

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

10/2023 - Present

Siemens Energy - Mülheim, Germany

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

- Acquire in-depth proficiency in using Siemens Energy's advanced toolchain, gaining insights into its functionalities and capabilities.
- Explore generative design methodologies and workflows, implementing various design possibilities and optimizing engineering solutions.
- Integrate self-learning algorithms, specifically Invertible Neural Networks, into the design toolchain, enhancing its efficiency and adaptability.
- Apply the developed toolchain to the practical scenario of H2 combustion system development, refining it based on real-time feedback and challenges faced.
- Summarize and extend the gained knowledge, synthesizing experiences and understanding theoretical foundations for future research endeavors.

Internship [Voluntary]

02/2023 - 08/2023

Volocopter HQ - Bruchsal, Germany

- 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

Wissenschaftliche Hilfskraft

02/2023 - Present

Digital Additive Production DAP - RWTH Aachen

- 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

05/2022 - 01/2023

Digital Additive Production DAP - RWTH Aachen

- 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.

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
Siemens Heeds	70

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.

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, COMSOL, 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>

^{1*} - Skill evaluation methodology