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 — **10/2023 -Present**

Siemens Energy - Mülheim, Germany

- Familiarize with Siemens Energy toolchain.
- Familiarize with the generative design method.
- Introduce the self-learning algorithm in the design toolchain.
- Apply the toolchain to the H2 combustion system development.
- Summarize the gained knowledge in a Master Thesis.

Internship [Voluntary] — **02/2023 - Present**

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

Wissenschaftliche Hilfskraft — **02/2023 - 08/2023**

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.

Wissenschaftliche Hilfskraft — **05/2022 - 08/2022**

Chair of Continuum Mechanics - RWTH Aachen

- 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.

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

Wissenschaftliche Hilfskraft **02/2022 - 01/2023**

Chair of Thermodynamics of Mobile Energy Conversion Systems - RWTH Aachen

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

CAE Engineer **03/2019 - 08/2020**

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 **01/2019 - 06/2019**

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.

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**.