

# Sundar Gurumurthy

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## SUMMARY

Mechanical engineer with 2.5+ years of experience in structural and mechanical design, finite element analysis (FEA), and fatigue life prediction. Skilled in creating and validating mechanical assemblies and structural components using industry-standard CAD and FEA tools. Proven ability to collaborate with cross-functional teams and suppliers to ensure design manufacturability and quality. Strong programming skills for automation and process improvement in simulation workflows.

## WORK EXPERIENCE

### Research Assistant

Jun 2024 – Present

*Welding and Additive Manufacturing Centre, Cranfield University*

- Developed FE models for WAAM processes (CW-MIG, PTA) to optimize microstructure and reduce defects.
- Designed efficient deposition sequences for complex parts using fast thermo-mechanical solvers.
- Integrated martensitic transformation effects into dissimilar metal deposition models.
- Carried out WAAM experiments and characterization using SEM, thermal imaging, and 3D scanning.
- Automated simulation workflows and data processing using Python and C++ to improve efficiency.
- Investigated stress, strain, and residual distortion using enhanced Inherent Strain Method validated against experimental data.

### Graduate Engineering Trainee

Jul 2021 – Jul 2022

*Sona Comstar, Gurugram, India*

- Designed and optimized complex mechanical and structural assemblies using Siemens NX, ensuring manufacturability and functional integration.
- Applied stack-up tolerance analysis to maintain precise fits and reliable assembly performance in drivetrain components.
- Collaborated with suppliers and cross-functional teams to manage component quality, design changes, and production handovers.
- Conducted Loaded Tooth Contact Analysis (LTCA) and fatigue life assessments to predict structural durability under variable load conditions.

### Student Trainee – Crash Structures

Feb 2021 – Jun 2021

*Mercedes-Benz R&D India, Bangalore, India*

- Built non-linear FE models for tire crash simulations using LS-Dyna.
- Evaluated air pressure modeling and contact algorithms in tire simulations.
- Proposed a verification test plan for composite material models.

## EDUCATION

### Cranfield University

Jan 2023 – Oct 2024

*MSc by Research in Manufacturing*

Thesis: *Understanding and Improving the Inherent Strain Method for Mechanical Analysis of WAAM*

Supervisors: Dr Yongle Sun and Dr Pradeeptta Taraphdar

- Conducted FE simulations to understand strain evolution during WAAM.

- Enhanced the Inherent Strain Method to better predict distortion and residual stress.
- Designed and executed experimental validations using 3D scanning and stress measurements.
- Affiliated with the NEWAM project focused on Ti6Al4V aerospace components.

**Birla Institute of Technology and Science (BITS), Pilani**

**Aug 2017 – Jun 2021**

*B.E. Mechanical Engineering, First Class*

CGPA: 7.71 / 10

## **TECHNICAL SKILLS**

**CAD & Design:** Siemens NX, CATIA V5, Fusion 360, Solid Edge

**Simulation:** ABAQUS, LS-Dyna, NASTRAN, ANSYS

**Programming:** Python, MATLAB, C/C++, FORTRAN, BASH

**Experimental Methods:** XRD, EBSD, 3D Laser Scanning, Thermal Imaging

**Fatigue & Integrity:** LTCA, S-N curves, fatigue life prediction, rotating component analysis

**Domains:** WAAM, FEA, Residual Stress Modeling, Crash Simulation, Mechanical Design, Advanced Manufacturing

## **ADDITIONAL SKILLS**

- Strong communication and coordination skills for presenting design and analysis findings to multi-disciplinary teams.
- Experienced in producing detailed technical reports and design documentation supporting engineering decisions.

## **PUBLICATIONS**

Full list available at: [www.sundar.guru/publications](http://www.sundar.guru/publications)

## **AWARDS**

- **AIAA/USU SmallSat Travel Award:** Sponsored by Blue Origin to present research at the SmallSat conference.

## **REFERENCES**

**Dr. Yongle Sun**

Lecturer, Cranfield University

[Yongle.Sun@cranfield.ac.uk](mailto:Yongle.Sun@cranfield.ac.uk)

**Dr. Pradeeptta Taraphdar**

Manufacturing Research Engineer, Jaguar Land Rover

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*All data in this document is true to the best of my knowledge as of July 22, 2025.*